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# Introduction

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*The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.*

**Sam Houston**

*Cultivated mind is the guardian genius of Democracy, and while guided and controlled by virtue, the noblest attribute of man. It is the only dictator that freemen acknowledge, and the only security which freemen desire.*

**Mirabeau B. Lamar**

*Where liberty has arisen, learning must be cherished—or liberty itself becomes a fragile thing.*

**Lyndon B. Johnson**

## Mission of the University

*The mission of the University is to achieve excellence in the interrelated areas of undergraduate education, graduate education, research, and public service. The University provides superior and comprehensive educational opportunities at the baccalaureate through doctoral and special professional educational levels. The University contributes to the advancement of society through research, creative activity, scholarly inquiry, and the development of new knowledge. The University preserves and promotes the arts, benefits the state's economy, serves the citizens through public programs, and provides other public service.*

*The Graduate School at the University of Texas at Austin is an active community of diverse scholars in over one hundred academic programs dedicated to excellence in original research, teaching, creative expression, and intellectual leadership. Using our extensive resources and talents, we cultivate individuals who work together to bring knowledge, innovation, and best practices to meet the great and small challenges of our time.*

## Officers of Administration

### The University of Texas at Austin

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Patricia C. Ohlendorf, JD, *Vice President for Legal Affairs*

Vacant, *Vice President for Research*

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Sharon Mosher, PhD, *Dean, John A. and Katherine G. Jackson School of Geosciences*

Andrew P. Dillon, PhD, *Dean, School of Information*

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Randy L. Diehl, PhD, *Dean, College of Liberal Arts*

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M. Lynn Crismon, PharmD, *Dean, College of Pharmacy*

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Luis Zayas, PhD, *Dean, School of Social Work*

Brent Iverson, PhD, *Dean, School of Undergraduate Studies*

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Scott C. Kelley, EdD, *Executive Vice Chancellor for Business Affairs*

Raymond S. Greenberg, MD, PhD, *Executive Vice Chancellor for Health Affairs*

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Randa S. Safady, PhD, *Vice Chancellor for External Relations*

Amy Shaw Thomas, JD, *Vice Chancellor and Counsel for Health Affairs*

William H. Shute, JD, *Vice Chancellor for Federal Relations*

Stephanie Bond Huie, PhD, *Vice Chancellor for Strategic Initiatives*

Patricia D. Hurn, PhD, *Vice Chancellor for Research and Innovation*

## Board of Regents

### Officers

Paul L. Foster, *Chairman*

R. Steven Hicks, *Vice Chairman*

Francie A. Frederick, *General Counsel to the Board of Regents*

### Members

#### Terms scheduled to expire February 1, 2017

Alex M. Cranberg, Austin

Wallace L. Hall Jr., Dallas

Brenda Pejovich, Dallas

#### Terms scheduled to expire February 1, 2019

Paul Foster, El Paso

Ernest Aliseda, McAllen

Jeffery D. Hildebrand, Houston

#### Terms scheduled to expire February 1, 2021

R. Steven Hicks, Austin

David J. Beck, Houston

Sara Martinez Tucker, Dallas

#### Student regent with term to expire May 31, 2016

Justin Drake, The University of Texas Medical Branch at Galveston

Each regent's term expires when a successor has been appointed and qualified and has taken the oath of office. The student regent serves a one-year term.

## Directory of Offices

The following list includes some University offices of general interest. A complete directory of offices on campus is published in the directory (<http://www.utexas.edu/directory/offices>).

## Academic Calendar

The academic calendar is published in *General Information* (<http://catalog.utexas.edu/general-information/introduction/academic-calendar>), in the *Course Schedule*, and at the Office of the Registrar's Web site (<http://registrar.utexas.edu/calendars>).

The University of Texas at Austin  
Office of the Registrar  
P O Box 7216  
Austin, TX 78713-7216

## Admission

Graduate and International Admissions Center (<http://www.utexas.edu/ogs/admissions>), Walter Webb Hall 102 (405 West 25th Street), (512) 475-7391, fax (512) 475-7395.

The University of Texas at Austin  
Graduate and International  
Admissions Center  
P O Box 7608  
Austin, TX 78713-7608

## Catalogs and Course Schedules

Catalogs and *Course Schedules* are published at the Office of the Registrar's Web site (<http://registrar.utexas.edu>).

The University of Texas at Austin  
Office of the Registrar  
P O Box 7216  
Austin, TX 78713-7216

## Fellowships, Teaching Assistantships, and Research Assistantships

Information and application forms for University fellowships, teaching assistantships, and research assistantships are available from the graduate adviser in each graduate program. General information on University fellowships, and additional information on fellowships funded by sources external to the University, is available from the fellowship director in the Graduate School, Main Building 101, (512) 232-3603.

The University of Texas at Austin  
Office of Graduate Studies  
110 Inner Campus Drive, Stop G0400  
Austin, TX 78712-1710

The mailing address for each graduate program is given in the program's section of Fields of Study (p. 27).

## Financial Assistance

Office of Student Financial Services (<http://finaid.utexas.edu>), Student Services Building 3.214, (512) 475-6282.

The University of Texas at Austin  
Office of Student Financial Services

P O Box 7758  
Austin, TX 78713-7758

## Housing

Information and application forms for University housing units are available at the Division of Housing and Food Service's Web site (<http://www.utexas.edu/student/housing>). A partial list of privately owned housing is also available through this site. Information is also available from the division at 200 West Dean Keeton Street (Kinsolving Dormitory), (512) 471-3136, fax (512) 475-6532.

The University of Texas at Austin  
Division of Housing and Food Service  
P O Box 7666  
Austin, TX 78713-7666

## International Students

International Office (<http://www.utexas.edu/international>), 2400 Nueces Street, Suite B, (512) 471-1211, fax (512) 232-4363.

The University of Texas at Austin  
International Office  
P O Box A  
Austin, TX 78713-8901  
USA

## Medical Services

University Health Services (<http://healthyhorns.utexas.edu>), Student Services Building 2.212, (512) 471-4955.

The University of Texas at Austin  
University Health Services  
P O Box 7339  
Austin, TX 78713-7339

## Registration Information

Registration (<http://registrar.utexas.edu/students/registration>), Main Building 1, (512) 475-7656, fax (512) 475-7515.

The University of Texas at Austin  
Office of the Registrar  
Registration  
P O Box 7216  
Austin, TX 78713-7216

## Services for Students with Disabilities

Division of Diversity and Community Engagement (<http://ddce.utexas.edu/disability>), Student Services Building 4.104, (512) 471-6259, video phone (866) 329-3986, fax (512) 475-7730.

The University of Texas at Austin  
Services for Students with Disabilities  
Division of Diversity and Community Engagement  
100 West Dean Keeton Street  
Student Services Building 4.206  
Austin, TX 78712-0175

## Transcripts

Office of the Registrar (<http://registrar.utexas.edu/students/records/transcripts>), Main Building 1, (512) 475-7689, fax (512) 475-7681.

The University of Texas at Austin  
Office of the Registrar

Transcripts  
P O Box 7216  
Austin, TX 78713-7216

## **Adding and Dropping Courses, Questions About Degree Programs, Information, and Forms**

Graduate School (<http://www.utexas.edu/ogs>), Main Building 101, (512)  
471-4511.

The University of Texas at Austin  
VP & Dean of Graduate Studies  
110 Inner Campus Drive, Stop G0400  
Austin, TX 78712-1710

# Graduate Study

The University of Texas at Austin, established in 1883, is a major research institution. It is the largest member of The University of Texas System. The University has grown from one building, two departments, eight faculty members, and 221 students on a forty-acre tract to a campus of more than 350 acres, with more than 110 buildings. The enrollment is about fifty thousand.

The faculty includes Pulitzer Prize and Nobel Prize winners and members of the National Academy of Sciences, the National Academy of Engineering, and the American Academy of Arts and Sciences. The University awards one of the largest number of doctoral degrees in the United States and is one of three southwestern members of the Association of American Universities.

The Graduate School was established in 1910 as the Graduate Department, but the first master's degree was awarded in 1886. The first doctoral degree was awarded in 1915. More than eleven thousand graduate students are now enrolled, and more than eight hundred doctoral degrees and twenty-eight hundred master's degrees are awarded each year.

The administration of the Graduate School (which does not include the School of Law) is the responsibility of the vice provost and dean of graduate studies. Graduate degrees are available in about a hundred fields. Each academic area that offers a graduate degree has a Graduate Studies Committee, a group consisting of all the assistant, associate, and full professors who are active in that graduate degree program. The Graduate Studies Committee recommends students for admission to the program, sets program-specific requirements for the graduate degrees in that area, and recommends students for admission to candidacy for degrees. Graduate education is the responsibility of the members of Graduate Studies Committees. One member serves as the graduate adviser to register and advise all graduate students, to maintain records, and to represent the Graduate School in matters pertaining to graduate work in that area.

## Accreditation

The University of Texas at Austin is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools to award bachelor's, master's, first-professional, and doctoral degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, GA 30033-4033 or call (404) 679-4500 for questions about the accreditation of the University of Texas at Austin.

## The Nature and Purpose of Graduate Work

Graduate work at the University is divided into disciplines. These are normally associated with departments; they may, however, be broader in scope, involving courses and research in several departments. The candidate for an advanced degree presents work done in a chosen major area, but usually he or she is also expected to have done supporting work on an advanced level (upper-division or graduate) in one or more relevant areas. There are three components of graduate study: coursework, independent study, and independent scholarly research leading to a report, thesis, recital, dissertation, or treatise. In some areas, internships, field studies, and other professional experiences may also be an integral part of the program. The proportion of each type of study varies according to the previous training of the student and the nature of the major area.

The objective of graduate study is to develop the intellectual breadth and to provide the specialized training necessary to a career in teaching,

research, the arts, or the professions. Emphasis is placed on the knowledge, methods, and skills needed for scholarly teaching, original research and problem solving, intellectual leadership, creative expression, and other modes of achievement in the student's discipline.

## Statement on Equal Educational Opportunity

The University of Texas at Austin is committed to an educational and working environment that provides equal opportunity to all members of the University community. In accordance with federal and state law, the University prohibits unlawful discrimination, including harassment, on the basis of race; color; religion; national origin; gender, including sexual harassment; age; disability; citizenship; and veteran status. Discrimination on the basis of sexual orientation, gender identity, and gender expression is also prohibited pursuant to University policy. Any member of the University community who feels he or she has been subject to discrimination, harassment, or retaliation should contact the Office of Institutional Equity (<http://www.utexas.edu/equity>) in person at NOA 4.302, Austin TX 78713; via e-mail at [oie@austin.utexas.edu](mailto:oie@austin.utexas.edu); or by phone at (512) 471-1849.

## Graduate Degrees

The Graduate School offers the following degrees.

Degree	Abbreviation
Master of Arts	MA
Master of Architecture	MArch
Master of Business Administration	MBA
Master of Education	MEd
Master of Fine Arts	MFA
Master of Global Policy Studies	MGlobalPolStds
Master of Interior Design	MID
Master of Landscape Architecture	MLA
Master of Music	MMusic
Master in Professional Accounting	MPA
Master of Public Affairs	MPAff
Master of Science in Accounting	MSAcc
Master of Science in Applied Physics	MSApplPhys
Master of Science in Architectural Studies	MSAS
Master of Science in Business Analytics	MSBA
Master of Science in Community and Regional Planning	MSCRCP
Master of Science in Computational Science, Engineering, and Mathematics	MSCSEM
Master of Science in Computer Science	MCompSci
Master of Science in Economics	MSEcon
Master of Science in Energy and Earth Resources	MSEER
Master of Science in Engineering	MSE
Master of Science in Finance	MSFin
Master of Science in Geological Sciences	MSGeoSci



Master of Science in Health Behavior and Health Education	MSHBHEd
Master of Science in Historic Preservation	MSHP
Master of Science in Identity Management and Security	MSIMS
Master of Science in Information, Risk, and Operations Management	MSIROM
Master of Science in Information Studies	MSInfoStds
Master of Science in Kinesiology	MSKin
Master of Science in Management	MSMan
Master of Science in Marine Science	MSMarineSci
Master of Science in Marketing	MSMkt
Master of Science in Neuroscience	MSNeurosci
Master of Science in Nursing	MSN
Master of Science in Pharmaceutical Sciences	MSPS
Master of Science in Social Work	MSSW
Master of Science in Statistics	MSStat
Master of Science in Sustainable Design	MSSD
Master of Science in Technology Commercialization	MSTC
Master of Science in Textile and Apparel Technology	MSTAT
Master of Science in Urban Design	MSUD
Doctor of Audiology	AuD
Doctor of Education	EdD
Doctor of Musical Arts	DMA
Doctor of Nursing Practice	DNP
Doctor of Philosophy	PhD

## Fields of Study

Graduate degrees are offered in the following fields. A complete list of fields in which graduate courses are taught is given in the appendix.

### School of Architecture

Field	Degree(s)
Architecture	MArch, PhD
Architectural history	MA
Architectural studies	MSAS
Community and regional planning	MSCRIP, PhD
Historic preservation	MSHP
Interior design	MID
Landscape architecture	MLA
Sustainable design	MSSD
Urban design	MSUD

### Red McCombs School of Business

Field	Degree(s)
Business administration	MBA
Accounting	MPA, MSAcc, PhD
Business analytics	MSBA
Finance	MSFin, PhD

Information, risk, and operations management	MSIROM, PhD
Management	MSMan, PhD
Marketing	MSMkt, PhD
Technology commercialization	MSTC

### College of Communication

Field	Degree(s)
Advertising	MA, PhD
Communication sciences and disorders	MA, AuD, PhD
Communication studies	MA, PhD
Journalism	MA, PhD
Radio-television-film	MA, MFA, PhD

### College of Education

Field	Degree(s)
Curriculum and instruction	MA, MEd, EdD, PhD
Educational administration	MEd, EdD, PhD
Educational psychology	MA, MEd, PhD
Foreign language education	MA, PhD
Health behavior and health education	MEd, MSHBHEd, PhD
Kinesiology	MEd, MSKin, PhD
Science, technology, engineering, and mathematics education	MA, MEd, PhD
Special education	MA, MEd, EdD, PhD

### Cockrell School of Engineering

Field	Degree(s)
Aerospace engineering	MSE, PhD
Architectural engineering	MSE
Biomedical engineering	MSE, PhD
Chemical engineering	MSE, PhD
Civil engineering	MSE, PhD
Electrical and computer engineering	MSE, PhD
Engineering management	MSE
Engineering mechanics	MSE, PhD
Environmental and water resources engineering	MSE
Materials science and engineering	MSE, PhD
Mechanical engineering	MSE, PhD
Operations research and industrial engineering	MSE, PhD
Petroleum engineering	MSE, PhD

### College of Fine Arts

Field	Degree(s)
Art education	MA
Art history	MA, PhD
Dance	MFA
Design	MFA
Music	MMusic, DMA, PhD
Studio art	MFA
Theatre	MA, MFA, PhD

## John A. and Katherine G. Jackson School of Geosciences

Field	Degree(s)
Energy and earth resources	MA, MSEER
Geological sciences	MA, MSGeoSci, PhD

## School of Information

Field	Degree(s)
Identity Management and Security	MSIMS
Information Studies	MSInfoStds, PhD

## College of Liberal Arts

Field	Degree(s)
African and African Diaspora studies	MA, PhD
American studies	MA, PhD
Anthropology	MA, PhD
Asian cultures and languages	MA, PhD
Asian studies	MA
Classics	MA, PhD
Comparative literature	MA, PhD
Creative writing	MFA
Economics	MA, MSEcon, PhD
English	MA, PhD
French	MA, PhD
Geography	MA, PhD
Germanic studies	MA, PhD
Government	MA, PhD
History	MA, PhD
Human dimensions of organizations	MA
Iberian and Latin American languages and cultures	MA, PhD
Italian studies	MA, PhD
Latin American studies	MA, PhD
Linguistics	MA, PhD
Mexican American studies	MA
Middle Eastern languages and cultures	MA, PhD
Middle Eastern studies	MA
Philosophy	MA, PhD
Psychology	MA, PhD
Religious studies	MA, PhD
Russian, East European, and Eurasian studies	MA
Sociology	MA, PhD
Women's and gender studies	MA

## College of Natural Sciences

Field	Degree(s)
Astronomy	MA, PhD
Biochemistry	MA, PhD
Cell and molecular biology	MA, PhD
Chemistry	MA, PhD
Computer science	MSCS, PhD
Ecology, evolution, and behavior	MA, PhD
Human development and family sciences	MA, PhD

Marine science	MSMarineSci, PhD
Mathematics	MA, PhD
Microbiology	MA, PhD
Neuroscience	MSNeurosci, PhD
Nutritional sciences	MA, PhD
Physics	MA, MSApplPhy, PhD
Plant biology	MA, PhD
Statistics	MSStat, PhD
Textile and apparel technology	MSTAT

## School of Nursing

Field	Degree(s)
Nursing	MSN, PhD, DNP

## College of Pharmacy

Field	Degree(s)
Pharmaceutical sciences	MSPS, PhD
Translational science	PhD

## Lyndon B. Johnson School of Public Affairs

Field	Degree(s)
Global policy studies	MGlobalPolStds
Public affairs	MPAff
Public policy	PhD

## School of Social Work

Field	Degree(s)
Social work	MSSW, PhD

## Intercollegial Programs

Field	Degree(s)
Computational science, engineering, and mathematics	MSCSEM, PhD
Writing	MFA

# Dual Degree Programs

Dual degree programs are structured so that a student can pursue graduate work at the University in two fields and fulfill the requirements of two degrees; in programs leading to two master's degrees, the degrees are awarded simultaneously. To enter a dual program, the student must be accepted by both of the individual programs. Students who wish to enter a dual program that involves the JD degree should contact the Admissions Office in the School of Law first. Dual programs are offered in the following fields.

Field(s) of Study	Degree(s)
Advertising/Business administration	MA/MBA
Advertising/Public affairs	MA/MPAff
Asian studies/Business administration	MA/MBA
Asian studies/Public affairs	MA/MPAff
Business administration/Energy and earth resources	MBA/MA
Communication studies/Business administration	MA/MBA

Communication studies/Latin American studies	MA/MA
Communication studies/Public affairs	MA/MPAff
Community and regional planning/ Geography	MSCR/PhD
Community and regional planning/ Sustainable design	MSCR/MSSD
Community and regional planning/ Urban design	MSCR/MSUD
Global policy studies/Asian studies	MGlobalPolStds/MA
Global policy studies/Business administration	MGlobalPolStds/MBA
Global policy studies/Energy and earth resources	MGlobalPolStds/MA
Global policy studies/Journalism	MGlobalPolStds/MA
Global policy studies/Latin American studies	MGlobalPolStds/MA
Global policy studies/Middle Eastern studies	MGlobalPolStds/MA
Global policy studies/Russian, East European, and Eurasian studies	MGlobalPolStds/MA
Information studies/Global policy studies	MSInfoStds/MGlobalPolStds
Information studies/Latin American studies	MSInfoStds/MA
Information studies/Public affairs	MSInfoStds/MPAff
Journalism/Business administration	MA/MBA
Journalism/Latin American studies	MA/MA
Journalism/Middle Eastern studies	MA/MA
Journalism/Public affairs	MA/MPAff
Latin American studies/Business administration	MA/MBA
Latin American studies/Community and regional planning	MA/MSCR
Latin American studies/Law	MA/JD
Latin American studies/Public affairs	MA/MPAff
Law/Business administration	JD/MBA
Law/Community and regional planning	JD/MSCR
Law/Global policy studies	JD/MGlobalPolStds
Law/Information studies	JD/MSInfoStds
Law/Middle Eastern studies	JD/MA
Law/Public affairs	JD/MPAff
Law/Russian, East European, and Eurasian studies	JD/MA
Law/Social work	JD/MSSW
Mechanical engineering/ Business administration	MSE/MBA
Middle Eastern studies/ Business administration	MA/MBA
Middle Eastern studies/ Information studies	MA/MSInfoStds
Middle Eastern studies/Public affairs	MA/MPAff
Nursing/Business administration	MSN/MBA
Public affairs/Business administration	MPAff/MBA
Public affairs/Civil engineering	MPAff/MSE

Public affairs/Community and regional planning	MPAff/MSCR
Public affairs/Energy and earth resources	MPAff/MA
Public affairs/Social work	MPAff/MSSW
Radio-television-film/Business administration	MA/MBA
Radio-television-film/Latin American studies	MA/MA
Radio-television-film/Middle Eastern studies	MA/MA
Radio-television-film/Public affairs	MA/MPAff
Radio-television-film/Russian, East European, and Eurasian studies	MA/MA
Russian, East European, and Eurasian studies/Business administration	MA/MBA
Russian, East European, and Eurasian studies/Public affairs	MA/MPAff
Social work/Latin American studies	MSSW/MA
Women's and gender studies/ Information studies	MA/MSInfoStds
Women's and gender studies/Public affairs	MA/MPAff

**Dual degree programs with other institutions.** The dual degree programs listed above lead to two University degrees; in other programs, students pursue degrees from the University and from another school at the same time. Dual degree programs in biomedical engineering, chemistry, biochemistry, cell and molecular biology, and neuroscience allow students to pursue both a Doctor of Philosophy degree from the University and a Doctor of Medicine degree from the University of Texas Medical Branch at Galveston. A dual degree program in business administration allows students to pursue a Master of Business Administration degree from the University and the degree of Master of Administration from Tecnológico de Monterrey-Campus Sante Fe. A dual degree program between the University's School of Social Work and the Austin Presbyterian Theological Seminary allows students to earn the Master of Science in Social Work from the University and the Master of Divinity from the seminary simultaneously. The University's LBJ School of Public Affairs offers dual degree programs with the University of Texas Health Science Center at Houston School of Public Health leading to the Master of Public Affairs or the Master of Global Policy Studies from the University and the Master of Public Health from the center. The University's School of Social Work also offers a dual degree program with the University of Texas Health Science Center at Houston School of Public Health leading to the Master of Science in Social Work from the University and the Master of Public Health from the center.

## Ad Hoc Interdisciplinary Doctoral Program

Students admitted to established academic programs may propose to construct an ad hoc interdisciplinary doctoral program that draws on the intellectual resources of several graduate programs and involves faculty members from more than one college or school. This procedure allows students who have been admitted to a graduate program to design a course of study that does not fit into an existing degree plan. Each program must be approved by the graduate dean.

Students interested in the ad hoc interdisciplinary doctoral program should consult the graduate adviser of the program to which they are admitted

or to which they plan to apply. Additional information is available from the Office of Graduate Studies.

## Combined JD/PhD Programs

The School of Law and the Graduate School offer programs leading to the Doctor of Jurisprudence and the Doctor of Philosophy with a major in government or philosophy. These programs are designed to prepare students for academic careers in law or the cognate discipline or both. By counting law courses toward the PhD and courses in the cognate discipline toward the JD, students can save up to a year of coursework. The law school provides financial aid to students at the dissertation stage of the program. More information on the JD/PhD in government is available at (512) 471-5121, and on the JD/PhD in philosophy at the School of Law's Web site (<http://www.utexas.edu/law/academics/centers/philosophy>).

## Graduate Portfolio Programs

The goal of graduate portfolio programs is to recognize and encourage cross-disciplinary research and scholarly activity. A portfolio program usually consists of four thematically related graduate courses and a research paper, presentation, or practical experience. The portfolio must include courses offered by at least two graduate programs other than the student's major program. Portfolio programs are approved by the Graduate School. Although the certification requirements of each program are independent of the requirements for graduate degrees, courses included in the Program of Work may, with appropriate approval, be counted toward certification. Upon completion of both degree and portfolio program requirements, the student's University transcript reflects portfolio certification.

Graduate portfolio programs are available in the following areas:

- African and African Diaspora studies
- Aging and Health
- Applied statistical modeling
- Arts and cultural management and entrepreneurship
- Asian American Studies
- Communication, information, and cultural policy
- Cultural studies
- Disability studies
- Dispute resolution
- Energy studies
- Imaging science
- Integrated watershed studies
- Interdisciplinary European studies
- Mexican American and Latina/o studies
- Molecular biophysics
- Museum studies
- Nanomanufacturing
- Nanoscience and nanotechnology
- Native American and indigenous studies
- Nonprofit studies
- Study of religion
- Robotics
- Romance studies
- Romance linguistics
- Russian, East European, and Eurasian studies
- Scientific computation
- Sustainability

- Women's and gender studies

## Cooperative Consortium Program

A cooperative arrangement between The University of Texas System and the Texas A&M University System allows a graduate student at one institution to use unique facilities or courses at the other institution with a minimum of paperwork. The graduate student registers and pays fees at the home institution and may retain any fellowship or financial assistance awarded by it. Space must be readily available, and the instructor or laboratory director of the proposed work must consent to the arrangement. Approval must be given by the graduate dean of each institution.

A similar arrangement among component institutions of The University of Texas System has been authorized by the chancellor and the Board of Regents. The University has active arrangements with the University of Texas Health Science Center at Houston, the University of Texas M. D. Anderson Science Park in Bastrop County, and the University of Texas Medical Branch at Galveston.

## Cooperative Degree Programs

With appropriate approval, the University of Texas at Austin and another component of The University of Texas System may enter into a cooperative agreement in which one component serves as the degree-granting institution while some or all of the courses in the degree program are taught at the other component. The component that grants the degree is the "sponsoring" institution. A student who enters such a cooperative program is admitted on the understanding that institutional sponsorship of the program may change during the student's enrollment. The student's continuation in the program will not be affected by such a transfer of sponsorship, but the student will become subject to the policies and procedures of the new sponsoring institution, which may differ from those of the original sponsor. The student will receive his or her degree from the component that sponsors the program at the time of the student's graduation.

## Libraries and Other Academic Resources

### The University Libraries

The libraries of the University are a resource center for Texas and the Southwest, as well as a national resource center for library materials on Latin America, Texas, the history of the American South and West, and nineteenth- and twentieth-century British, French, and American literature. Libraries include the University of Texas Libraries, the Dolph Briscoe Center for American History, the Harry Ransom Humanities Research Center, and the Joseph D. Jmail Center for Legal Research: Tarlton Law Library. The University of Texas Libraries include the Perry-Castañeda Library, the Nettie Lee Benson Latin American Collection, six science and technology libraries, and several other branches and special collections.

The University Libraries Web site (<http://www.lib.utexas.edu>) serves as the gateway to an array of online information resources. These include the online library catalog (<http://catalog.lib.utexas.edu>) which provides information on most items located in the collections of the University of Texas Libraries, the Dolph Briscoe Center for American History, and the Humanities Research Center, and a partial listing for items in the Law Library. The University Libraries Web site also offers access to millions of pages of specially licensed scholarly information, including the full text of articles and illustrations from thousands of journals, the full text of about eighty thousand books in electronic format, several hundred indexes, and

an extensive online map collection. A variety of library services are also available online.

Detailed information about the University Libraries is given in *General Information*.

## Perry-Castañeda Library

This six-level open stack library (<https://www.lib.utexas.edu/pcl>) contains more than 2.5 million volumes and is the main library of the University. It serves most subject areas but emphasizes the humanities; the social sciences; business; education; nursing; social work; and European, East European, Asian, Middle Eastern, Hebraic, and Judaic studies. Special materials include United States and United Nations official documents, current journals, and newspapers. On-site reference service is offered, and graduate students may consult subject bibliographers to identify useful resources and gain access to them.

## Dolph Briscoe Center for American History

The Dolph Briscoe Center for American History (<http://www.cah.utexas.edu>) is a special collections library, archive, and museum that facilitates research and sponsors programs on the historical development of the United States. The center supports research and education by acquiring and preserving research collections and making them accessible and by sponsoring exhibitions, conferences, fellowships, and grant-funded initiatives. Research collection strengths are the history of Texas, the South, the Southwest, and the Rocky Mountain West, congressional history, and other specific national topics.

More information is given in *General Information* (<http://catalog.utexas.edu/general-information/libraries-and-other-academic-resources/dolph-briscoe-center-for-american-history>).

## Harry Ransom Center

The Harry Ransom Center (<http://www.hrc.utexas.edu>) is one of the world's foremost institutions for literary and cultural research. It offers resources in a number of disciplines and periods, but its principal strength is in its collections of twentieth-century British, American, and French literature. The center houses about a million books, thirty million manuscripts, five million photographs, and more than one hundred thousand works of art.

More information is given in *General Information* (<http://catalog.utexas.edu/general-information/libraries-and-other-academic-resources/harry-ransom-humanities-research-center>).

## Law Library

The Joseph D. Jamail Center for Legal Research: Tarlton Law Library (<http://tarlton.law.utexas.edu>) is one of the largest academic law libraries in the country, with more than a million volumes of codes, statutes, court decisions, administrative regulations, periodicals, textbooks, and treatises on law and related fields. It offers a strong collection of foreign and international legal materials.

More information is given in *General Information*.

## Special Collections and Branch Libraries

The Nettie Lee Benson Latin American Collection (<http://www.lib.utexas.edu/benson>), an internationally recognized resource for research in Latin American and United States Latino studies, contains more than a million volumes of books, pamphlets, and journals, in addition to extensive collections of manuscripts, maps, newspapers, photographs, recordings, and microfilm. It includes materials on any subject related to Latin America or written by a Latin American, regardless of language.

The branch libraries are the Architecture and Planning Library (<http://www.lib.utexas.edu/apl>) (including the Alexander Architectural Archive (<http://www.lib.utexas.edu/apl/aaa>)), the Mallet Chemistry Library (<http://www.lib.utexas.edu/chem>), the Classics Library (<http://www.lib.utexas.edu/classics>), the Collections Deposit Library, the Fine Arts Library (<http://www.lib.utexas.edu/fal>), the Walter Geology Library (<http://www.lib.utexas.edu/geo>), the Human Rights Documentation Initiative (<http://www.lib.utexas.edu/hrdi>), the Life Science Library (<http://www.lib.utexas.edu/lsl>), the Kuehne Physics Mathematics Astronomy Library (<http://www.lib.utexas.edu/pma>), and the Marine Science Library (<http://www.lib.utexas.edu/msl>) in Port Aransas. Reference, circulation, and reserves services are available at all branch libraries.

## Other Libraries in Austin

The Lyndon Baines Johnson Library and Museum (<http://www.lbjlibrary.org>), located on campus, is operated by the National Archives and Records Administration. This library is a valuable resource for the study of the twentieth century. Faculty members and students also have access to other public and private libraries in the Austin area, including several special-interest libraries.

## Research Facilities

The University offers some of the most extensive university research facilities in the United States. There are more than a hundred organized research units on campus and many other informally organized laboratories; they give graduate students the opportunity to conduct laboratory and field research in almost all fields of study. Internships are also offered in many fields.

## Information Technology Services

Information Technology Services (<http://www.utexas.edu/its>) (ITS) supports the University's academic and research programs by providing an information-technology-based environment, technological capabilities, and a staff to assist students, faculty and staff members, academic departments, and research centers with their learning, teaching, research, and outreach activities. ITS provides the University's core computing, wired and wireless networking, videoconferencing, satellite conferencing, network directory, domain name, and information processing infrastructure, as well as a broad range of services and support programs.

The facilities and services provided by ITS are described in *General Information* (<http://catalog.utexas.edu/general-information/libraries-and-other-academic-resources/computing-resources>).

## Financial Aid

### Fellowships

University fellowships, which are administered through the Graduate School, are awarded to both new and continuing graduate students in most academic areas. Students must be nominated by their graduate advisers for any fellowship administered by the Graduate School. Additional information is available from the Graduate School (<http://www.utexas.edu/ogs/funding/fellowships>).

University recruiting fellowships for entering graduate students are awarded on the basis of scholastic excellence and adequate preparation for graduate study in the student's chosen field, as shown by his or her academic record and letters of recommendation. University fellowships for continuing students are awarded on the basis of the student's record since entering the Graduate School, including performance in relevant coursework and research or creative activity, letters of recommendation from University faculty members, and the endorsement of the graduate

adviser; financial need is also considered. There are additional specific qualifications for many of the competitive fellowships awarded by the University and by graduate programs. Generally, fellowships require no service from the recipient. Major fellowships provide for payment of nearly all tuition in addition to the stipend.

## Assistantships

Various teaching, research, and academic assistantships are awarded by the departments. These appointments require specific service. Nonresidents and international students who hold assistantships of at least twenty hours a week may pay resident tuition if the assistantship duties are related to the student's degree program. An applicant may indicate on the admission application that he or she would like to be considered by the graduate program for a teaching assistantship or a research assistantship. Enrolled students should apply directly to the department in which they would serve.

## Additional Financial Aid and Deadlines for Financial Aid

The Office of Student Financial Services offers financial assistance in the form of gift aid, which includes grants and scholarships, and self-help aid, which includes student employment programs and long-term loans. To apply for these programs, all applicants are encouraged to complete the Free Application for Federal Student Aid (FAFSA). More information about these programs and deadlines for filing the FAFSA are published by Student Financial Services (<http://finaid.utexas.edu>). Information is also available by mail from The University of Texas at Austin, Office of Student Financial Services, P O Box 7758, Austin TX 78713-7758.

Individual graduate programs may also offer financial assistance to their students. For more information about these programs and deadlines for applying to them, applicants should contact the graduate program of interest. Financial aid decisions are made soon after program application deadlines, and applicants whose materials have not been received may not be given full consideration.

## Student Services

In addition to student services provided by the Office of Graduate Studies, support services for students are provided by several other offices, including the Division of Housing and Food Service; University Health Services; the Counseling and Mental Health Center; and Parking and Transportation Services. The functions of these and similar offices are described in *General Information*.

Graduate students are represented on campus and in the community by the Graduate Student Assembly, described below. In addition, there are social and professional groups for graduate students in most fields of study, and hundreds of registered student organizations that are open to undergraduates and graduate students.

## Graduate Student Assembly

The Graduate Student Assembly (GSA) is the official representative body for graduate students. GSA addresses issues that are important to its constituents, not only as students but also as teaching assistants, research assistants, and assistant instructors. GSA reports administratively to the vice provost and dean of graduate studies and the vice president for student affairs. Administrative expenses are funded through an allocation from students' tuition.

The objectives of GSA are to represent the views of graduate students to the University community and the community at large; to facilitate graduate student communication and interaction; to gather and disseminate information pertinent to graduate students; to conduct

activities that promote the general welfare of graduate students; and to provide a means of assisting in the selection of graduate student members of departmental, college, and University bodies.

More information about GSA, including contact information for officers, current representatives, meeting agendas and minutes, and current and past activities, is available at the GSA's Web site (<http://www.utexasgsa.org>).

## Student Responsibility

While University faculty and staff members give students academic advice and assistance, each student is expected to take responsibility for his or her education and personal development. The student must know and abide by the academic and disciplinary policies given in this catalog and in *General Information*, including rules governing quantity of work, the standard of work required to continue in the University, warning status and scholastic dismissal, and enforced withdrawal. The student must also know and meet the requirements of his or her degree program; must enroll in courses appropriate to the program; must meet prerequisites and take courses in the proper sequence to ensure orderly and timely progress; and must seek advice about degree requirements and other University policies when necessary.

The student must give correct local and permanent postal addresses, telephone numbers, and e-mail address to the Office of the Registrar and must notify this office immediately of any changes. Official correspondence is sent to the postal or e-mail address last given to the registrar; if the student has failed to correct this address, he or she will not be relieved of responsibility on the grounds that the correspondence was not delivered. Students may update their addresses and telephone numbers at the Office of the Registrar's Web site (<http://registrar.utexas.edu/services>).

The student must register by the deadlines given in the *Course Schedule* and must verify his or her schedule of classes each semester, must see that necessary corrections are made, and must keep documentation of all schedule changes and other transactions.

Students should be familiar with the following sources of information:

**University catalogs.** The catalog of the University is the document of authority for all students. Any academic unit may issue additional or more specific information that is consistent with approved policy. However, the information in the catalog supersedes that issued by any other unit if there is a conflict between the two. The University reserves the right to change the requirements given in the catalog at any time.

The catalog consists of four issues: the *Undergraduate Catalog*, the *Graduate Catalog*, the *Law School Catalog*, and *General Information*. Each issue is published online by the Office of the Registrar (<http://registrar.utexas.edu/catalogs>).

The *Undergraduate Catalog* is published by the first day of class in August of even-numbered years; the *Graduate Catalog* is published by the first day of class in August of odd-numbered years; the *Law School Catalog* is published in the spring of even-numbered years. These issues contain regulations and degree requirements that apply to undergraduates, graduate students, and students in the School of Law. Regulations are valid only for the two academic years indicated by the dates in the title of each publication; for an explanation of the period for which degree requirements are valid, see the section "Graduation under a Particular Catalog" in each issue. The lists of available course offerings for each academic unit are correct at the time of publication but are subject to change. They are superseded by course offerings published each semester and summer session in the *Course Schedule*.

*General Information*, published by the first day of class in August, contains current and historical information about the University's organization and physical facilities. It gives important information about academic policies and procedures that apply to all students for the academic year indicated in the title of the publication. It includes the official academic calendar, admission procedures, residence requirements, information about tuition and fees, and policies on quantity of work, grades and the grade point average, credit by examination and correspondence, adding and dropping courses, withdrawal from the University, and scholastic probation and dismissal. *General Information* is meant to be used along with each of the other issues; each student must be familiar with the regulations given there and with those given in the issue that covers his or her degree program.

Assistance in obtaining information about the University—including costs, refund policies, withdrawal, academic programs, the faculty, accreditation, and facilities and services for disabled persons—is available from V. Shelby Stanfield, Vice Provost and Registrar, at (512) 475-7510 and at The University of Texas at Austin, Office of the Registrar, P O Box 7216, Austin TX 78713-7216.

**The Course Schedule.** The *Course Schedule* is published by the Office of the Registrar and is available before registration for each semester and summer session. The *Course Schedule* includes information about registration procedures; times, locations, instructors, prerequisites, and special fees of classes offered; and advising locations.

**The University Directory.** The University directory (<http://www.utexas.edu/directory>) gives physical and e-mail addresses and telephone numbers of students and faculty and staff members.

**University Web site.** The address for the University's home page (<http://www.utexas.edu>). In addition to the publications described above, the Web site includes sites maintained by departments, colleges, graduate programs, museums, libraries, research units, and student-service offices.

**The Office of Graduate Studies.** The Office of Graduate Studies (<http://www.utexas.edu/ogs>) is the central source of information for graduate students. Doctoral and master's degree evaluators provide information about procedures for submission of reports, theses, dissertations, and treatises, and the student services section assists with registration and related matters. Information for both prospective and current students is available online.

**Graduate advisers, assistant graduate advisers, and graduate coordinators.** The graduate adviser for each program is a faculty member designated to advise students and represent the Graduate School in matters pertaining to graduate study. He or she provides information about the program, including admission and degree requirements, and about fellowships, teaching assistantships, and research assistantships. The assistant graduate adviser, also a faculty member, serves in the absence of the graduate adviser. The graduate coordinator, a staff member who assists the graduate adviser and other faculty members in the administration of the program, also provides services to students.

# Admission and Registration

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All students seeking admission to the Graduate School should consult the Graduate School's admissions Web site: <http://www.utexas.edu/ogs/admissions/> for information and application forms. The student must submit an official transcript from each senior-level college he or she has attended and official scores on the Graduate Record Examinations General Test (GRE) or Graduate Management Admission Test (GMAT). International students whose native language is not English must also submit scores on the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS). The applicant should consult the graduate adviser for the program to which he or she is applying to learn which test to take and to learn about additional material required by the program.

A nonrefundable processing fee is charged each applicant to the Graduate School, the McCombs School of Business, or the School of Law. Current fee amounts are given in Application Processing Fees (<http://catalog.utexas.edu/general-information/admission/graduate-admission/application-processing-fee>). Under certain circumstances, applicants to the Graduate School may be eligible for a waiver of the application fee; additional information about the fee waiver is available online ([http://www.utexas.edu/ogs/admissions/fee\\_waiver.html](http://www.utexas.edu/ogs/admissions/fee_waiver.html)). Applicants may apply simultaneously to more than one graduate program; a fee may be charged for each application.

## Admission

### Admission Requirements

General requirements for admission to the Graduate School are

1. A bachelor's degree from a regionally accredited institution in the United States or a comparable degree from a foreign academic institution. The Graduate and International Admissions Center (GIAC) will determine eligibility for admission in consultation with prospective graduate programs.
2. A grade point average of at least 3.00 in upper-division (junior- and senior-level) coursework and in any graduate work already completed.
3. An official score on the Graduate Record Examinations General Test (GRE), unless otherwise specified by the graduate program to which the student is applying. The McCombs School of Business requires master's and doctoral degree applicants to submit a satisfactory score on either the GRE or the Graduate Management Admission Test (GMAT). Applicants to dual or combined degree programs with the School of Law must submit a satisfactory score on the Law School Admission Test (LSAT) as well as on the GRE or GMAT. International students whose native language is not English must also submit scores on the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS). For more information on which countries qualify for a waiver of this requirement, as well as programs that do not waive the requirement, please visit the Graduate School's Web site ([http://www.utexas.edu/ogs/admissions/test\\_scores.html](http://www.utexas.edu/ogs/admissions/test_scores.html)). Applicants should consult the graduate adviser for the program of interest to learn which test the program requires.
4. Adequate subject preparation for the proposed major. Evidence of adequate preparation varies by program, but examples include letters of reference, auditions, samples of work, and personal statements.
5. A recommendation for acceptance by the Graduate Studies Committee for the proposed major area.

Applicants may apply simultaneously to more than one graduate program, but they may enroll in only one program, with the exception of applicants admitted to dual degree programs. All complete applications are forwarded to the Graduate Studies Committee(s) to which they are directed. Admission decisions are based on a careful review of all aspects of the applicant's file including standardized tests, undergraduate gpa, letters of recommendation, research and teaching experience, etc. Graduates of foreign institutions may be required to have a minimum score on an English-language-proficiency test such as the TOEFL or the IELTS. Information about admission criteria for each graduate program is available from the graduate adviser.

When there are more qualified applicants than can adequately be instructed by the faculty or accommodated in the facilities, the Graduate Studies Committee (GSC) for the proposed area may deny admission to students who have met the prescribed requirements. GSC admissions recommendations to the graduate dean are final; there is no appeal. All admissions must be approved by the graduate dean.

Applicants who feel that their grade point averages or test scores are not valid indicators of ability should explain their concerns in a letter to the graduate adviser of the program to which they are applying.

### Admission Tests

The Graduate Record Examinations General Test (GRE), the Graduate Management Admission Test (GMAT), and the Test of English as a Foreign Language (TOEFL) are offered at testing centers throughout North America and at selected international sites. Current information about GRE and TOEFL test dates, locations, and registration procedures is published by the Educational Testing Service (<http://www.ets.org>). Similar information about the GMAT is published by the Graduate Management Admission Council (<http://www.gmac.com/gmat.aspx>).

The International English Language Testing System (IELTS) is administered in more than 120 countries and is available off-site in additional countries. Information about IELTS test dates, locations, and procedures is published online (<http://www.ielts.org>).

Applicants to dual or combined programs with the School of Law must also take the Law School Admission Test (LSAT), administered by the Law School Admission Council. Information about the LSAT is published by the council online (<http://lsac.org>).

### Graduate School Select Admission Program

The Graduate School Select Admission Program allows graduate programs to recommend academically outstanding University undergraduates for admission to seek a graduate degree. Students are normally nominated in the junior year, and programs are encouraged to limit their nominations each year to one or two outstanding undergraduates.

Nominations are forwarded to the Graduate School by the program's graduate adviser or graduate admissions office with the recommendation of the Graduate Studies Committee. Undergraduate candidates may be extended an offer of admission and financial aid as early as the junior year, conditional upon completion of the baccalaureate degree. Application and transcript fees are waived; some graduate programs may waive submission of GRE scores. Admitted students may enroll in graduate courses at undergraduate tuition rates during the senior year and reserve the courses for graduate credit.



## Admission with Conditions

Almost all of the students who are admitted to the Graduate School have qualifications equal to or better than the minimum standards outlined in Admission Requirements.

However, a Graduate Studies Committee may recommend, with the consent of the graduate dean, that a student be admitted to the Graduate School with conditions. The Graduate Studies Committee may require the student to maintain a certain grade point average or to take a certain number of semester hours of coursework. A conditionally admitted student may also be required to remedy deficiencies in undergraduate preparation by taking upper-division or graduate courses. The graduate adviser notifies the student of these conditions at the time of admission. The Graduate Studies Committee petitions the graduate dean for removal of conditions once the conditions have been met. A student who does not fulfill the conditions within the specified time may be barred from subsequent registration in the Graduate School. If the student changes his or her major before the conditions have been fulfilled, the conditions remain in effect unless the graduate adviser for the new program, on behalf of the Graduate Studies Committee, petitions the graduate dean and receives approval for them to be changed.

**Students admitted with conditions are not eligible to be teaching assistants, assistant instructors, graduate research assistants, academic assistants, assistants (graduate), or tutors (graduate) except under rare and unusual circumstances and with the approval of the graduate dean.**

## Admission as a Nondegree Student

A person who would like to take graduate coursework without becoming a candidate for an advanced degree may apply for admission to a graduate program as a nondegree student. Admission as a nondegree student is not available in all graduate programs. Enrollment as a nondegree student is normally limited to one year. Nondegree students are not eligible to be teaching assistants, assistant instructors, graduate research assistants, academic assistants, assistants (graduate), or tutors (graduate).

The applicant must submit an application and transcripts of all college coursework to the Graduate and International Admissions Center (GIAC); Graduate Record Examinations (GRE) scores are not required unless otherwise specified by the graduate program. International students whose native language is not English must also submit scores on the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) unless otherwise exempt ([http://www.utexas.edu/ogs/admissions/test\\_scores.html](http://www.utexas.edu/ogs/admissions/test_scores.html)). Admission must be recommended by the Graduate Studies Committee for the program and approved by the graduate dean.

A graduate nondegree student who later wishes to seek a graduate degree must meet the requirements for admission listed above, submit the material described in "Applying for Admission" below by the program's deadline and must pay the usual application fee. A degree-seeking student may petition to have applied to the master's degree up to six semester hours of graduate credit earned while he or she was a graduate nondegree student.

**Undergraduate nondegree students.** With the approval of the instructor and the graduate adviser, an undergraduate nondegree student may take any graduate course for which he or she has met the prerequisite. The student will not receive credit toward a graduate degree for courses he or she takes as an undergraduate nondegree student.

**Exchange students.** A graduate student who is admitted to the University through a reciprocal exchange program is classified as a nondegree student and is subject to all policies affecting nondegree students.

Additional information about the exchange student status is given on the Exchange Students page (p. 18).

## Applying for Admission

Application for admission to the Graduate School consists of submitting to the Graduate and International Admissions Center (GIAC) the official online application form, transcripts, test scores, and processing fees. Instructions and forms are available at the Graduate School's admissions Web site (<http://www.utexas.edu/ogs/admissions>). Students may also indicate their interest in assistantships and fellowships on the application form.

Each graduate program may require the submission of additional materials. These materials vary by program, but examples include letters of reference, auditions, samples of the student's work, and personal statements. Information about required materials is available from the graduate adviser of each program.

Because graduate programs set their own application deadlines, the applicant must be sure to inquire about the deadline for the program to which he or she is applying. Many programs have deadlines as early as December 1 for the following summer session or fall semester, but some programs set different dates. Few graduate programs admit new students for the spring semester; those that do have deadlines no later than October 1. It is the applicant's responsibility to meet the deadline set by the graduate program. A list of program deadlines is given at the Graduate School's admissions Web site (<http://www.utexas.edu/ogs/admissions/programs.html>).

**Deadlines for those seeking financial aid.** Information about financial aid and financial aid deadlines is given on the Financial Aid page (p. 13).

## International Students

In addition to meeting the general requirements for admission, applicants whose native language is not English must demonstrate sufficient competence in English to study effectively at the University. These applicants are required to submit scores on either the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) to the Graduate School. Information about TOEFL (<http://www.ets.org/toefl>) and IELTS (<http://www.ielts.org>) is published online.

Because transcripts from foreign universities require special evaluation, prospective international students are advised to submit their application forms, test scores, and upload transcripts well in advance of deadlines. Early submission gives the University enough time to process the application and gives the applicant enough time to obtain visas and make travel arrangements if admission is granted. A nonrefundable processing fee is required with each application for admission to the Graduate School, the McCombs School of Business, or the School of Law. All payments must be in US dollars and drawn on US banks. Current fee amounts are given in Application Processing Fees (<http://catalog.utexas.edu/general-information/admission/graduate-admission/application-processing-fee>).

International students must maintain approved comprehensive health insurance or coverage. The student's registration bill includes the premium for the University health insurance policy, unless approval to substitute alternate, comparable coverage has been given by the International Office.

## Enrollment Deposit

Some graduate programs require students to pay a nonrefundable enrollment deposit upon admission to indicate that they accept the offer of admission. The current amounts of these deposits are given in *General*

*Information.* For students applying to dual degree programs, one deposit serves to confirm the student's intention of enrolling in both programs. When both programs require deposits, only the higher fee is required. The deposit is applied to the payment of fees when the student enrolls.

## Readmission

All graduate students are expected to enroll and pay tuition by the twelfth class day of the fall semester and the spring semester of each academic year until they graduate. A student who does not do so must apply for readmission in order to return to the University. He or she must submit an Application for Readmission to the Graduate and International Admissions Center (GIAC) by the deadline given in *General Information* and must pay the general application fee. The fee is waived if the student has received an official leave of absence as described in Continuous Registration (p. 21). The student must also obtain the approval of the graduate adviser in the program in which he or she was last enrolled. Readmission to a graduate program is not guaranteed. A former graduate student who was in good standing when he or she left the University is not required to submit official transcripts unless they are requested by the student's graduate program.

To change to a different major, the student must submit an Application for Admission to Another Graduate Major to the Graduate School, as described on the Application to Another Graduate Major (Change of Major) page (p. 21).

## Exchange Students

A graduate student who is admitted to the University through a reciprocal exchange program is classified as a nondegree student. An exchange student may not register for more than two long-session semesters and one summer session. The transferability of academic credit to the student's home institution is determined by the home institution.

An exchange student who wishes to take a graduate course must obtain the approval of the instructor and of the graduate adviser for the program that offers the course, must meet all course prerequisites, and must meet any other requirements affecting nondegree students. The rules that apply to nondegree students are given in *General Information*.

An exchange student may later apply for admission to the University as a degree-seeking graduate student. To do so, he or she must submit the usual test scores, application fee, and other required material by the appropriate deadline, as described in "Applying for Admission" on the Admission page (p. 17). If the applicant is admitted, the Graduate Studies Committee may seek the graduate dean's approval to include on the Program of Work for the master's degree up to six hours of graduate coursework that the student completed as a nondegree exchange student. All requirements related to courses that may be counted toward graduate degrees apply, including rules concerning courses counted toward another degree.

## Registration

University students register online for each semester and summer session. Complete information about the registration process is given in the *Course Schedule*.

### Registration for New Graduate Students

Applicants are notified by e-mail of their admission or denial. Admitted applicants should notify their graduate advisers as soon as possible whether they plan to accept admission. Either in an interview or by correspondence, the admitted applicant should then learn the specific requirements of his or her graduate program. Students should consult the

*Course Schedule* to learn whether advising before registration is required in their major area.

## Late Registration

The period of late registration is given in the *Course Schedule*. During this period, a student may register with the consent of the graduate adviser, and a late fee is imposed. After this period, registration is permitted only under exceptional circumstances, upon recommendation of the graduate adviser, and with consent of the graduate dean and the registrar.

## Registration for Continuing Graduate Students

Continuing graduate students should consult the *Course Schedule* to learn whether advising before registration is required in their major area.

To continue in the Graduate School beyond the first semester or summer session, the student must make satisfactory progress in fulfilling any admission conditions that were imposed, meet any requirements made in writing by the Graduate Studies Committee, maintain a graduate grade point average of at least 3.00, and receive the approval of the Graduate Studies Committee. For more information about grade requirements, see Graduate Credit (p. 20).

## Registration Following Graduation

Students who wish to continue enrollment beyond the semester in which their degree is awarded must be admitted as nondegree students or as degree-seeking students in a new degree program. Students must request a change of major or degree-seeking status from the Graduate School.

## Course Load

### Maximum Course Load

The maximum course load for a graduate student is fifteen semester hours in a long-session semester or twelve semester hours in a twelve-week summer session. A heavier course load must have the recommendation of the graduate adviser and the approval of the graduate dean. It is permitted only under exceptional circumstances.

### Full-Time Course Load

There is no minimum course load for graduate students; however, the Graduate School recognizes nine semester hours during a long-session semester and three hours during a summer session as a minimum *full-time* course load. Individual graduate programs may require more.

Agencies that grant loans or provide for educational funding may establish different definitions of full-time status. The student should be familiar with the regulations of any agency to which he or she has an obligation.

Under various circumstances, graduate students must register for and must remain registered for a full-time load. The definition of a full-time load that is used in each case is given below.

*Holders of Graduate School-administered fellowships and scholarships:* Nine hours each semester and three hours in the summer session (in any combination of summer-session terms).

*Graduate student academic employees:* Nine hours each semester and three hours in the summer session (in any combination of summer-session terms). A "graduate student academic employee" is a graduate student who is also employed by the University under one of the following titles: teaching assistant, assistant instructor, graduate research assistant, academic assistant, assistant (graduate), and tutor (graduate).

*Students receiving certain student loans:* Nine hours each semester and three hours in the summer session (in any combination of summer-session terms).

*Students living in University housing* should consult the Division of Housing and Food Service for course-load regulations.

*International students:* Nine hours each semester. An international student must consult with International Student Scholar Services and must have the written permission of his or her dean to take fewer than nine hours. No minimum load is required in the summer. Some approved courses in English as a second language do not carry University credit, but each course is considered the equivalent of a three-hour course for purposes of the course load requirement. Students may enroll in these courses with the approval of their graduate adviser.

*Affiliated studies:* Students enroll in affiliated studies (AS) when they participate in a study abroad program offered by an institution with which the University has an affiliation agreement. Students enrolled in affiliated studies are considered full-time students. More information about affiliated programs is given in *General Information*.

*International study and research:* Students may enroll in international study and research (ISR) when they conduct research or study independently abroad. A student enrolled in international study and research is considered a full-time student. Doctoral candidates may not use registration in ISR to circumvent the continuous registration (p. 21) requirement. When a doctoral candidate receives approval to enroll in ISR, however, that enrollment is an acceptable substitute for registration in dissertation hours, except in the final semester, when enrollment in the dissertation writing course (-99W) is required. More information about international study and research is available from the Study Abroad Office (<http://world.utexas.edu/abroad>).

## In Absentia Registration

Students must be registered for the semester in which they graduate and must apply for graduation by the deadline published in the academic calendar. A student who fails to complete all degree requirements or misses the deadline for acceptance of the thesis, report, recital, dissertation, or treatise must register and pay tuition the following semester or summer session in order to receive the degree.

An exception is made for students who apply to graduate in the summer session but miss the deadline for acceptance of the thesis, report, recital, dissertation, or treatise. In this case, the student will be registered in absentia for the fall semester, only for the purpose of receiving the degree, by degree evaluators in the Office of Graduate Studies. The thesis, report, recital, dissertation, or treatise must be accepted by the deadline for in absentia registration, which falls before the beginning of the following fall semester. Additional exceptions may be granted by the graduate dean under unusual administrative circumstances. The fee for in absentia registration is \$25. The student will be registered in absentia only once.

## Adding and Dropping Courses

Before classes begin, a student who has registered may add or drop a course online as described in the *Course Schedule*. The student may also add or drop a course online during the first four class days of a long-session semester. From the fifth through the twelfth class day, he or she may add or drop a course with the approval of his or her graduate adviser and of the department in which the course is given. After the twelfth class day, the student may add a course only under rare and extenuating circumstances approved by the graduate dean.

In each summer-session term, the student may add or drop a course online during the first two class days. On the third and fourth class days, he or she may add or drop a course with the approval of his or her graduate adviser and of the department in which the course is given. After the fourth class day, the student may add a course only under rare and extenuating circumstances approved by the graduate dean.

A student may drop a course with the required approvals through the last class day of a semester or summer term. He or she receives a refund for courses dropped by the twelfth class day of a long-session semester or by the fourth class day of a summer term. From the thirteenth through the twentieth class day of a long-session semester, and from the fifth through the tenth class day of a summer term, the student may drop a course with no academic penalty; the symbol Q is recorded. If the student drops a course after that time, the instructor determines whether the symbol Q or a grade of F should be recorded.

If the student is in a warning status because of failure to maintain a grade point average of at least 3.00, he or she may not drop a course without the recommendation of the graduate adviser and the approval of the graduate dean.

The student should note that dropping a course may cause his or her course load to drop below that required for full-time status.

Specific deadlines for adding and dropping courses are given in the academic calendar; procedures are given in the *Course Schedule*.

## Evaluation

Letter grades and the symbols for credit and no credit, *CR* and *NC*, are most commonly used to record the instructor's evaluation of students' performance in a course. Under specific conditions, other symbols may be used to record students' standing in a class. Grades and symbols and the policies governing them are described in *General Information*.

## Withdrawal from the University

Dropping an entire course load constitutes withdrawal from the University for that semester.

To withdraw from the Graduate School, the student must file with the graduate dean a withdrawal petition, a form that also explains refund policies. The student may withdraw through the last class day of the semester. If the student abandons his or her courses without withdrawing, the instructor in each class determines what grade should be recorded.

Students in a warning status because of failure to maintain a grade point average of at least 3.00 may not withdraw without a petition from the graduate adviser and the approval of the graduate dean.

A student may not be employed in an academic position beyond the last date of his or her enrollment. Students must end their academic appointments prior to withdrawing.

# Degree Requirements

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The general requirements for graduate degrees are given in this chapter. Specific requirements and course descriptions for each graduate program are given in Fields of Study (p. 27). Detailed information about each degree program is available from the graduate adviser and the graduate coordinator for that program.

## Limitation for Faculty

No tenured member of the faculty of the University of Texas at Austin may pursue an advanced degree at this institution.

## Grade Point Average

The graduate grade point average is calculated by the registrar and appears on the student's official record maintained by the registrar. To graduate, all graduate students must have a graduate grade point average of at least 3.00. Additionally, candidates for the master's degree must also have a grade point average of at least 3.00 in courses included on the Program of Work. Individual Graduate Studies Committees may set grade point average requirements of 3.00 or higher for all or a portion of their students' coursework.

Additional information about grades, symbols, and the graduate grade point average is given in *General Information*.

## Graduate Credit

Only the courses that appear on the student's Program of Work are counted toward the degree. The following policies govern the inclusion of courses on the Program of Work.

## Courses Taken in Residence

**Courses completed with a letter grade.** Courses in which the student earned a grade of at least C while registered in the Graduate School may be included in the Program of Work. Limitations on the amount of undergraduate work that may be included are given in the section Reservation of Work for Graduate Credit (p. 21).

**Courses completed on the credit/no credit basis.** No more than 20 percent of the hours on the Program of Work for a master's degree may have been taken on the credit/no credit basis, and no more than a comparable portion of the Program of Work for the doctoral degree. Thesis, master's report, master's recital, dissertation, and treatise courses, which are offered only on the credit/no credit basis, are not included in the 20 percent. More information about credit/no credit grading is given in *General Information*.

**Courses with incomplete grades.** Courses for which the symbol X (incomplete) or I (permanent incomplete) is recorded may not be included on the Program of Work. More information about incomplete grades is given in *General Information*.

## Transfer of Credit

Ordinarily, all work for the master's degree must be done at the University of Texas at Austin. Under some circumstances, a maximum of six semester hours of graduate coursework in which the grade is A or B may be transferred to the Program of Work from another institution, but only on the basis of a petition by the Graduate Studies Committee and with the approval of the graduate dean. (In the School of Nursing, a higher number of hours may be transferred in some degree programs.) A student seeking a transfer of credit must provide the Graduate School with an official transcript and an official explanation of the course numbering and grading

systems at the school at which the credit was earned. Only graduate courses may be transferred. Work counted toward a degree at another institution cannot be transferred. Students are encouraged to seek approval before taking any coursework they plan to transfer. Students should not take courses at another institution during the semester they plan to graduate because the grades may not be received in time to certify the student's Program of Work for graduation. Unless its inclusion has been approved by the graduate dean, no coursework listed on the Program of Work may be over six years old.

The doctoral Program of Work normally includes no more than six semester hours of courses transferred from another university. The Graduate School recognizes that the academic background of each doctoral student is different, and exceptions to the six-hour maximum may be granted with approval of the Graduate Studies Committee.

Transferred coursework as described in this section appears only on the student's Program of Work. It does not appear on the official student record maintained by the registrar. Because it is not part of the official record, such coursework does not appear on the student's transcript and is not included in either the graduate grade point average or the Program of Work grade point average.

## Extension Credit

Up to six semester hours of work done in extension classes through the University's Continuing and Innovative Education may be listed on the Program of Work, with the approval of the Graduate Studies Committee and the graduate dean. The extension credit must be in graduate courses; the courses and instructors must be approved in advance by the Graduate School and by the program in which the student would otherwise take the work on campus; and the student must be admitted to the Graduate School before taking the extension courses. Because students must be registered at the University in the semester in which they graduate, they cannot be registered solely for extension courses in their final semester.

All grades in graduate courses taken through Continuing and Innovative Education are included in the graduate grade point average.

## Correspondence Credit

Courses taken by correspondence may not be counted toward graduate degrees.

## Credit by Examination

Credit by examination may not be counted toward graduate degrees.

## Enrollment of Undergraduates in Graduate Courses

### Graduate Work for Undergraduate Credit

An undergraduate may enroll in a graduate course under the following conditions:

1. He or she must be an upper-division student and must fulfill the prerequisite for the course (except graduate standing).
2. He or she must have a University grade point average of at least 3.00.
3. He or she must receive the consent of the instructor of the course and of the graduate adviser for the field in which the course is offered. Some colleges and schools may also require the approval of the dean's office. Individual divisions may impose additional requirements or bar undergraduates from enrolling in graduate courses.
4. Students in most colleges must have their dean's approval before they register for a graduate course.

Undergraduate students may not enroll in graduate courses that have fewer than five graduate students enrolled.

A graduate course taken by an undergraduate is counted toward the student's bachelor's degree in the same way that upper-division courses are counted, unless the course is reserved for graduate credit as described in the next section. Courses reserved for graduate credit may not also be used to fulfill the requirements of an undergraduate degree.

An undergraduate student enrolled in a graduate course is subject to all University regulations affecting undergraduates.

## Reservation of Work for Graduate Credit

Under the following conditions, a degree-seeking undergraduate may enroll in a graduate course and reserve that course for credit toward a graduate degree:

1. The student must have a University grade point average of at least 3.00.
2. The student must have completed at least ninety semester hours of coursework toward an undergraduate degree.
3. The student may not register for more than fifteen semester hours in the semester or for more than twelve semester hours in the summer session in which the course is reserved.
4. No more than twelve semester hours may be reserved for graduate credit.
5. All courses reserved for graduate credit must be approved by the twelfth class day of the semester or the fourth class day of the summer session by the course instructor, the student's undergraduate adviser, the graduate adviser in the student's proposed graduate major area, the dean of the student's undergraduate college, and the graduate dean. A form ([http://www.utexas.edu/ogs/pdn/pdf/reserve\\_grad\\_credit.pdf](http://www.utexas.edu/ogs/pdn/pdf/reserve_grad_credit.pdf)) for this purpose is available on the Graduate School Web site.

An undergraduate student enrolled in a graduate course is subject to all University regulations affecting undergraduates.

A student who reserves courses for graduate credit must be admitted to a University graduate program through regular channels before the credit may be applied toward a graduate degree. By allowing a student to earn graduate credit while still an undergraduate, the University makes no guarantee of the student's admissibility to any graduate program.

A course reserved for credit may be listed on the student's Program of Work for the master's or doctoral degree. Because it was taken before the student entered the Graduate School, it is not included in the graduate grade point average.

## Use of the Course 398T on the Program of Work

With the consent of his or her Graduate Studies Committee, a student may include the college teaching methodology course, numbered 398T, on the Program of Work. Master's degree students may include up to three semester hours. Doctoral degree students may include up to six semester hours, if they complete both introductory and advanced teaching methodology courses.

## Courses Counted toward Another Degree

No course counted toward another degree may be counted toward a master's degree, either directly or by substitution.

Work done for the master's degree may be included in the work for the doctoral degree, provided it is acceptable to the Graduate Studies

Committee, the supervising committee, and the graduate dean and provided it has not already been used toward another doctoral degree.

Students in a dual degree program must meet the course requirements for both degrees. Courses common to the two curricula in a dual degree program are included on the Program of Work for one of the degrees and are waived by the other degree program as specified in the dual degree program requirements. The Program of Work on which courses are waived must meet the Graduate School's minimum-credit-hour requirements for the degree. A list of approved dual degree programs is given on the Dual Degree Programs (p. 10) page.

## Continuous Registration

All graduate students are expected to enroll and pay tuition by the twelfth class day of the fall semester and the spring semester of each academic year until graduation. If the student has been admitted to candidacy for the doctoral degree, registration in the dissertation course or the equivalent or in international study and research (ISR) is required. The only alternative to continuous registration is a leave of absence, discussed in the Leave of Absence section below.

If a student who is not on approved leave fails to register by the twelfth class day, he or she may not return to the University without applying for readmission. The student must apply for readmission both to the University and to the graduate program and must pay the general application fee. The application is reviewed by the Graduate Studies Committee, which may choose to readmit the student or to deny readmission.

In order to fulfill the continuous registration requirement, doctoral candidates who are readmitted must retroactively register and pay tuition for all semesters that have elapsed since they were last enrolled.

## Leave of Absence

Graduate students may apply for a leave of absence of no more than two semesters. Requests for a leave of absence must be approved in advance by the graduate adviser and the graduate dean. Applications from students who have been admitted to candidacy will be approved by the graduate dean only in rare and unusual circumstances.

A student on approved leave must apply for readmission in order to return to the University, but readmission during the approved period is automatic and the application fee is waived.

A student on leave may not use any University facilities; nor is he or she entitled to receive advice from any member of the faculty. A leave of absence does not alter the time limits for degrees or coursework.

## Application to Another Graduate Major (Change of Major)

To change his or her major, a student must submit the form Application for Admission to Another Graduate Major to the Graduate School Graduate and International Admissions Center (GIAC). The application must be approved by the graduate adviser in the new program. Students should consult the graduate adviser for the proposed new major about deadlines and additional requirements, procedures, and materials.

If the student has been away from the University for a semester or longer, he or she must apply for readmission as described on the Readmission page (p. 18).

# Warning Status, Academic Dismissal, and Termination

To continue in the Graduate School beyond the first semester or summer session, the student must make satisfactory progress in fulfilling any admission conditions that were imposed, meet any requirements made in writing by the Graduate Studies Committee, maintain a graduate grade point average of at least 3.00, and receive the approval of the Graduate Studies Committee.

Graduate Studies Committees are responsible for evaluating the students in their programs to ensure that they are making satisfactory progress toward a degree. If the Graduate Studies Committee finds that a student is not making satisfactory progress, it may recommend to the graduate dean that the student's program be terminated.

A graduate student whose cumulative graduate grade point average falls below 3.00 at the end of any semester or summer session will be warned by the Office of Graduate Studies that his or her continuance in the Graduate School is in jeopardy. The student must attain a cumulative graduate grade point average of at least 3.00 during the next semester or summer session he or she is enrolled or be subject to dismissal; during this period, the student may not drop a course or withdraw from the University without the approval of the graduate adviser and the graduate dean.

A graduate student who has been dismissed may be readmitted for further graduate study only by petition of the Graduate Studies Committee in the student's major area or by the Graduate Studies Committee of another program that will accept the student. The petition must be approved by the graduate dean.

Warning status and academic dismissal are reflected on the student's academic record.

Additional information about grades and the grade point average is given in *General Information*.

## Time Limits

### Master's Degree

All requirements for a master's degree must be completed within one six-year period. Work over six years old may be reinstated only with the permission of the graduate dean, upon recommendation of the Graduate Studies Committee.

### Doctoral Degree

All completed work that is included in a doctoral student's degree program at the time of admission to candidacy must have been taken within the previous six years (exclusive of a maximum of three years of United States military service). The Graduate Studies Committee will review the program of students who have not completed the degree at the end of two years from admission to candidacy; the committee will review the status of the student's program yearly thereafter. At those times, the committee may recommend additional coursework, further examinations, or termination of candidacy. In addition, the program is subject to review by the graduate dean.

## The Master's Degree

The University offers two types of master's degree. The first, the Master of Arts, requires advanced study in the humanities, sciences, or education and the preparation of a thesis or report. This degree frequently serves as preparation for further study. The second type of master's degree

provides preparation in a professional field. These degrees are offered in such fields as architecture, business administration, education, engineering, fine arts, information studies, nursing, pharmacy, public affairs, and social work. A complete list appears on the Graduate Degrees (p. 8) page. Often, these degree programs require more coursework than the Master of Arts but do not include a thesis or report.

The following general requirements for the master's degree set a minimum standard. With the approval of the graduate dean, specific programs may impose additional requirements.

## Prerequisites

Every master's degree program assumes that participants have a general college education through the baccalaureate level. Accordingly, to enter a master's degree program a student must hold a baccalaureate degree from a regionally accredited United States institution or proof of equivalent training outside the United States. He or she must also have taken at least twelve semester hours of upper-division undergraduate coursework in the area of the proposed graduate major or must have the consent of the graduate dean. Some areas may require more undergraduate preparation. Students who lack adequate preparation may be admitted to a graduate program on the condition that they complete additional preparatory coursework designated by the graduate adviser. These courses are in addition to the thirty semester hours or more required for the master's degree itself.

## Supervising Committee

Each master's degree program is developed under the guidance of a supervising committee with two or more members, one of whom is designated as supervisor. The supervisor must be a member of the Graduate Studies Committee in the major area. In general, all committee members must be members of a Graduate Studies Committee. Occasionally, scholars who hold nonfaculty appointments at the University—research scientists, research engineers, or adjunct faculty members—or off-campus scholars are appointed because their expertise would be valuable to the student. The composition of the committee is subject to the approval of the graduate dean. The supervising committee is responsible for the quality, depth, and balance of the student's educational experience.

## Options

The Graduate School recognizes three options under which a student may pursue the master's degree: with thesis, with report, and without thesis or report. All three options may not be available in any one field of study; information about the options that are possible is given in chapter 4 or is available from the student's graduate adviser.

For each option, the Graduate School requires at least thirty semester hours of credit. Individual programs may have higher requirements, and many programs do require more hours in the report and no thesis/no report options than in the thesis option. No more than nine semester hours of upper-division coursework may be included on the Program of Work, and no more than six of these hours may be in the major area. In some degree programs and options, the number of upper-division hours allowed is lower.

At least eighteen semester hours must be in the major area; the thesis, report, or recital course, if part of the program, must be in the major. At least six hours must be in supporting work. Supporting work, often referred to as the minor, is an obligatory part of each degree program. It consists of coursework outside the major area, although the Graduate Studies Committee may permit some or all of it to be taken in other areas within the department.

The exact number of hours in the major area and in supporting work is determined in consultation with the graduate adviser. The Graduate Studies Committee must then review and approve the Program of Work, made up of the proposed courses in the major area and in supporting work. Courses listed on the Program of Work may not be more than six years old. The student may earn no more than 20 percent of the hours of credit listed on the Program of Work on the credit/no credit basis; thesis, report, and recital courses are not included in the 20 percent.

**Master's degree with thesis.** Each student's Program of Work must include at least twenty-one semester hours of graduate courses, including the thesis course. The thesis is prepared under the direction of a supervisor, who is chair of the supervising committee. It is subject to the approval of the committee and ultimately of the graduate dean. Six semester hours of credit are granted for researching and writing the thesis. Course 698A (research project) must precede course 698B (writing period); 698A may not be repeated for credit. Both 698A and 698B must be taken on the credit/no credit basis. The student must register for 698B the semester he or she intends to graduate. In the event that a student completes and submits their Master's thesis while enrolled in 698A, the student will be allowed to add 698B in the same semester in order to graduate. The thesis cannot be accepted before the semester in which the student applies for graduation.

The thesis is normally written in English. Requests for permission to write in another language pertinent to the research will be granted when there are circumstances warranting an exception. An insufficient command of English is not justification for an exception. The petition from the graduate adviser should include assurance that faculty members competent both in the language and in the field are available and willing to serve on the thesis committee. The request must be approved by the graduate dean when the student is admitted to candidacy. The abstract and a substantial summary and conclusions section in English must be submitted with the thesis.

The student must submit the thesis in approved electronic format to the Office of Graduate Studies. The thesis will be retained by the University Libraries and will be made available to the public through the Texas Digital Library. Information about format requirements is available in the Office of Graduate Studies.

Some students seeking the Master of Music complete a recital rather than a thesis. All policies affecting the master's degree with thesis apply to the master's degree with recital, but the student completes the two-semester course Music 698R, *Master's Recital*, rather than a thesis course. The recital is prepared under the direction of a supervisor, who is chair of the supervising committee, and graded by faculty members from the student's performance area.

**Master's degree with report.** Each student's Program of Work must include at least twenty-four hours of graduate courses, including the report course. The report is prepared under the direction of a supervisor, who is chair of the supervising committee. Reports typically result from gathering special materials, from an internship or similar experience, or from seminars, conference courses, or supervised research. The report is subject to the approval of the committee and ultimately of the graduate dean. Three semester hours of credit are granted for preparing the report; the student must register for the master's report course. The student must take this course on the credit/no credit basis and must register for it the semester that he or she files for graduation.

The student must submit the report in approved electronic format to the Office of Graduate Studies. The report will be retained by the University Libraries and will be made available to the public through the Texas Digital Library. Information about format requirements is available in the Office of Graduate Studies.

**Master's degree without thesis or report.** Each student's Program of Work must include at least twenty-four semester hours of graduate courses. Students must be registered the semester they apply to graduate.

## The Doctor of Philosophy

The Doctor of Philosophy is a research degree designed to prepare students to discover, integrate, and apply knowledge as well as to communicate and disseminate it. The degree emphasizes development of the capacity to make significant original contributions to knowledge within the context of free inquiry and expression. The student pursuing this degree is expected to develop the ability to understand and to evaluate the literature of his or her field and to apply appropriate principles and procedures to the recognition, evaluation, interpretation, and understanding of issues at the frontiers of knowledge. In contrast to the PhD, other doctorates such as the Doctor of Education, the Doctor of Audiology, and the Doctor of Musical Arts are designed for professional training or focus on applied rather than basic research.

### Course Requirements

The Program of Work for the Doctor of Philosophy degree must have a minimum of thirty semester hours of advanced coursework, including dissertation hours. All the completed coursework that is included in a degree program at the time of admission to candidacy for a doctoral degree must have been taken within the preceding six years (exclusive of a maximum of three years of United States military service). All doctoral work is subject to review by the graduate dean.

In addition to courses and research in a field of specialization, additional work is taken to broaden or supplement the field. This supporting work may consist of coursework in one area or several; it may be in conference, laboratory, or problems courses; or it may be a supervised activity off campus relevant to the major interest. Normally, some or all of the supporting work is outside the major area, unless that area covers more than one department; at least three courses or the equivalent from outside the major area are generally proposed.

### Foreign Language Requirement

The Graduate School has no foreign language requirement. However, many graduate programs require the study of one or more languages. These requirements are given in Fields of Study (p. 27) or are available from the graduate adviser.

### Graduate Studies Committee Requirements

The Graduate Studies Committee specifies the coursework the student must complete, the qualifying examinations (written or oral or both) he or she must pass, the conditions under which he or she may retake all or part of an examination, and the procedures he or she must follow in developing a dissertation proposal.

In consultation with the graduate adviser, the student proposes a Dissertation Committee to advise or direct the student on the research and writing of the dissertation. The student selects the chair of the Dissertation Committee, with the consent of that person.

### Admission to Candidacy

Each student seeking the PhD must be admitted to candidacy on the recommendation of the Graduate Studies Committee in the major area. Students may not register for the dissertation course until they are admitted to candidacy, and completion of coursework does not in itself

constitute admission. Formal admission to doctoral candidacy consists of the submission and approval of the following:

1. **Program of Work.** The Program of Work comprises a list of courses taken and proposed, the prospective dissertation title, and similar information. The Graduate Studies Committee must approve the Program of Work. The Dissertation Committee may, in a review of the Program of Work, recommend additional course requirements to the Graduate Studies Committee.
2. **Dissertation Committee.** The membership of the Dissertation Committee, proposed by the student with the consultation and approval of the graduate adviser, is submitted to the Graduate School for approval by the graduate dean. The committee consists of at least four members. At least three of the committee members, including the student's supervisor or co-supervisor, must be Graduate Studies Committee members in the student's major program, and at least one committee member must be from outside the student's Graduate Studies Committee. The purpose of the outside committee member is to provide an independent assessment of the student's mastery of their subject. The dissertation supervisor or co-supervisor serves as the committee chair.
3. **Dissertation Proposal.** A brief statement of the proposed dissertation must be submitted.

## The Dissertation Committee

The Dissertation Committee advises the student on the research and writing of the dissertation, conducts the final oral examination, and approves the dissertation.

The chair of the Dissertation Committee ordinarily serves as the supervisor of research. Other members of the committee should be consulted as appropriate. Occasionally, a research scientist, research engineer, or faculty member who is not a member of the Graduate Studies Committee may be recommended by the Graduate Studies Committee to serve as the research supervisor for a specific dissertation. When the research supervisor is not a member of the Graduate Studies Committee, a member of the Graduate Studies Committee will be appointed as co-chair of the Dissertation Committee.

## The Dissertation

The student must register for dissertation courses for a period of more than one semester or summer session. The dissertation research course (-99R) must precede the dissertation writing course (-99W) and may not be repeated. In the event that a student completes and successfully defends his or her dissertation while registered in -99R, the student will be allowed to add -99W in order to graduate. A dissertation is required of every candidate.

The format of the dissertation today ranges from the traditional "book" authored by a single student to a series of unrelated papers and/or journal articles with multiple authorship. Graduate School policy recognizes that approaches to the dissertation vary across disciplines, and specifies only that the format chosen for students of a doctoral program be consistent with practices of similar programs in AAU institutions. Dissertations consisting of multiple-authored papers or articles must include a detailed description of the contribution of the dissertator to each. Supervising committee members will sign the signature page only when they are satisfied that the contribution of the dissertator to the multiple-authored papers or articles is sufficient to represent a dissertation. The dissertation must be approved by the Dissertation Committee.

The dissertation is normally written in English. Requests for permission to write in another language pertinent to the research are granted when there are circumstances warranting an exception. An insufficient command of English is not justification for an exception. The formal

petition from the graduate adviser should include assurance that faculty members competent both in the language and in the field are available and willing to serve on the Dissertation Committee. The request must be approved by the graduate dean when the student is admitted to candidacy. The abstract and a substantial summary and conclusions section in English must be submitted with the dissertation.

## Review of Progress

During their first semester all students intending to pursue doctoral study are required to review and sign the Milestones Agreement Form with their program. The purpose of the form is to ensure that the student has been advised of the degree requirements, has been shown a list of major academic milestones for obtaining the PhD degree, and has been provided with an estimate of the timelines for reaching milestones.

The program Graduate Studies Committee reviews the progress of students who have not completed the doctoral degree by the end of two years from admission to candidacy; the committee reviews each student's progress annually thereafter. The committee may recommend that the student's candidacy be extended for up to one year, that the student take additional courses or examinations, or that the candidacy be terminated for lack of satisfactory academic progress. Recommendations are forwarded to the graduate dean for approval.

## Final Oral Examination (Defense of Dissertation)

A satisfactory final oral examination is required for the approval of a dissertation. The exam is open to all members of the University community and the public, unless attendance is restricted by the Graduate Studies Committee.

Four weeks before the date on which the student intends to defend the dissertation, unless otherwise agreed to by the committee members, a copy of the final draft of the dissertation, reviewed by the supervisor, should be submitted to each member of the dissertation committee. Two weeks before the defense, a written request to hold the final oral examination must be submitted to the Graduate School. This request signifies the receipt of the doctoral dissertation for the purpose of giving the examination.

The examination covers the dissertation and the general field of the dissertation and such other parts of the student's program as the committee determines. If the members of the committee are satisfied that the dissertation is a scholarly investigation in the major field which constitutes a contribution to knowledge and that the student has passed the final oral examination, they indicate approval on the Report of Dissertation Defense.

In the event that a committee cannot reach a decision concerning the dissertation, the matter is referred to the graduate dean for review. The results of the review are communicated to the student, the graduate adviser, the chair of the Graduate Studies Committee, the committee members, and the department chair, if applicable.

## Submission of the Dissertation

After defending the dissertation, the student must submit it in an approved electronic format to the Office of Graduate Studies. The dissertation is retained by the University Libraries. Information about format requirements is available from the Office of Graduate Studies.

Dissertations must be made available to the public. A list of ways of doing this is available from the Office of Graduate Studies. The student may request permission from the graduate dean to temporarily delay making the dissertation available to the public in order to protect patent or other



rights. This request must be supported by a written recommendation from the dissertation supervisor. The graduate dean makes the final decision regarding delayed publication.

The student may arrange for registration of copyright, at his or her own expense, by completing a form available in the Office of Graduate Studies or through an arrangement with a publisher of the student's choice.

## Approval of the Degree

Upon approval by the Dissertation Committee of the dissertation and its defense, the Graduate Studies Committee certifies that the student has completed all degree requirements, has passed all required examinations, and is entitled to the award of the doctoral degree.

## The Doctor of Education

The Doctor of Education (EdD) is a professional degree that emphasizes preparation for the highest levels of educational practice. It provides academic training and educational service experiences for individuals who will have leading roles in educational practice and who will help define the scope and functions of education in society. Programs are oriented toward the application of theory and research to issues of education and human development and to the development of skilled practitioners to fill a variety of roles in institutions that educate children, youth, and adults.

Students in educational administration complete a treatise; those pursuing the EdD in other fields complete a dissertation. Most policies affecting the EdD are similar to those described for the PhD (p. 23), such as the requirement for a minimum of thirty semester hours of advanced coursework, including dissertation or treatise hours. Additional policies on admission to the program and to candidacy are given below.

## Admission

In addition to the requirements for admission to the Graduate School, each department may require evidence of successful performance in an educational setting and evidence of interpersonal problem-solving skills and other skills useful for predicting success in professional educational roles. The applicant must hold a master's degree from a regionally accredited United States institution or the equivalent.

## Admission to Candidacy

In addition to the requirements listed for the PhD degree, the curriculum must have a clear and predominantly applied focus. The student's program normally entails an internship in an operational setting that is distinct from previous or concurrent work experience.

In addition to the requirements listed for the PhD degree in regard to the Dissertation Committee, at least one member of the committee must be from outside the major program or from the field of practice represented by the dissertation.

## The Doctor of Audiology

The Doctor of Audiology provides academic and clinical training for those who plan to enter the profession of audiology. The degree program involves preparation for the diagnosis and nonmedical treatment of hearing and balance disorders; it is designed to prepare audiologists to meet the standards for Texas state licensure in audiology.

The program requires a minimum of eighty-two semester hours of coursework and is designed to be completed in four years. All preprofessional students in audiology complete the same set of core courses and basic clinical practicum. Students may choose from a set of

electives based on their specific interests. Research experiences are part of the curriculum, but a dissertation is not required.

The Graduate Studies Committee in communication sciences and disorders oversees the AuD degree program. More information about the program is available from the graduate adviser in communication sciences and disorders.

## The Doctor of Musical Arts

The Doctor of Musical Arts degree allows for three majors: performance (including conducting, opera, collaborative piano, and voice pedagogy emphases), composition, and music and human learning (including conducting and piano pedagogy emphases). Most policies affecting the DMA are similar to those described for the PhD (p. 23), such as the requirement for a minimum of thirty semester hours of advanced coursework, including treatise hours. Candidates for this degree must pass a comprehensive examination. They must demonstrate outstanding professional competence, artistic maturity, and exceptional knowledge of the historical and practical aspects of their major field. Each candidate must prepare a scholarly treatise in a field appropriate to the major or complete the alternative requirements of the nontreatise degree option. For composition majors, a musical work replaces the treatise. A jazz emphasis is available in each of the three majors.

Further information about requirements in various areas of concentration is available from the graduate adviser.

## Graduation

The University holds commencement exercises at the end of the spring semester. Those who graduate in the preceding summer session or fall semester are eligible to attend along with those who graduate in the spring semester. In addition, the Graduate School holds a Convocation at the end of the spring semester at which master's and doctoral degree candidates are individually recognized.

## Graduation under a Particular Catalog

Degree requirements may be changed from one catalog to the next. The student is normally bound by the requirements of the catalog in force at the time of his or her first registration; the student may choose, however, to fulfill the requirements of a subsequent catalog. If the student does not fulfill the requirements within six years of his or her first enrollment in the Graduate School, he or she is then bound by the requirements of a subsequent catalog. The student may choose the catalog in effect in any year in which he or she is enrolled in the Graduate School, within the six-year limit.

## Procedures of Graduation

Candidates for Master of Business Administration and Master in Professional Accounting degrees should consult advisers in their program for graduation procedures. All other degree candidates must follow the procedures below. More information -- including detailed guidelines, deadlines, and forms -- is available from the Office of Graduate Studies ([http://www.utexas.edu/ogs/student\\_services/convocation](http://www.utexas.edu/ogs/student_services/convocation)).

## Master's Degree Candidates

1. Be registered in the Graduate School in the semester or summer session in which he or she plans to graduate.
2. Submit the online Master's Graduation Application, Program of Work, and post-graduation employment information via the Graduate School Web site by the published deadline; if the student's graduation is postponed, he or she must file a new form.

3. Submit the thesis or report to the supervising committee by the deadline the committee establishes.
4. Submit the thesis or report to the Office of Graduate Studies for final approval by the graduate dean no later than the published deadline. The thesis or report must be submitted in an approved electronic format. The format must follow the guidelines published online.
5. Submit a signature page containing the signatures of the thesis or report supervising committee and all required forms associated with degree certification to the Office of Graduate Studies no later than the published deadline. Candidates who have completed a thesis or report must also submit a copy of the title page and an abstract.

The University of Texas Rio Grande Valley (<http://www.utsystem.edu/institutions/university-texas-rio-grande-valley>)

The University of Texas at San Antonio (<http://www.utsystem.edu/institutions/university-texas-san-antonio>)

The University of Texas at Tyler (<http://www.utsystem.edu/institutions/university-texas-tyler>)

The University of Texas Southwestern Medical Center at Dallas (<http://www.utsystem.edu/institutions/university-texas-southwestern-medical-center>)

The University of Texas Medical Branch at Galveston (<http://www.utsystem.edu/institutions/university-texas-medical-branch-galveston>)

The University of Texas Health Science Center at Houston (<http://www.utsystem.edu/institutions/university-texas-health-science-center-houston>)

The University of Texas Health Science Center at San Antonio (<http://www.utsystem.edu/institutions/university-texas-health-science-center-san-antonio>)

The University of Texas M. D. Anderson Cancer Center (<http://www.utsystem.edu/institutions/university-texas-md-anderson-cancer-center>)

The University of Texas Health Science Center at Tyler (<http://www.utsystem.edu/institutions/university-texas-health-science-center-tyler>)

## Doctoral Degree Candidates

1. Have completed the Intellectual Property (Copyright) Tutorial. If the candidate's research involves human subjects, he or she must have provided evidence of ethical review by the departmental review committee and, if appropriate, by the University Institutional Review Board. The Institutional Review Board form should be attached to the Statement of Research with Human Participants form.
2. Be registered in the Graduate School in the semester or summer session in which he or she plans to graduate.
3. File the Doctoral Graduate Degree Candidate Form, including post-graduation employment information, in the Office of Graduate Studies by the published deadline; if the student's graduation is postponed, he or she must file a new form.
4. Provide each member of the Dissertation/Treatise Committee with a copy of the dissertation or treatise for evaluation.
5. Schedule the final oral examination with the Office of Graduate Studies.
6. Pass the final oral examination. The candidate's Dissertation/Treatise Committee will report the successful result of the examination to the Office of Graduate Studies on the form Report of Dissertation Defense.
7. Upload the final dissertation in electronic format to the submission site by the published deadline.
8. Submit the Committee Certification of Approved Version (signature page) and all required forms and fees associated with degree certification by the published deadline.

## Other Components of the University of Texas System

For information about graduate programs and courses at the following components of The University of Texas System, consult their current catalogs.

The University of Texas at Arlington (<http://www.utsystem.edu/institutions/university-texas-arlington>)

The University of Texas at Brownsville (<http://www.utsystem.edu/institutions/university-texas-brownsville>)

The University of Texas at Dallas (<http://www.utsystem.edu/institutions/university-texas-dallas>)

The University of Texas at El Paso (<http://www.utsystem.edu/institutions/university-texas-el-paso>)

The University of Texas - Pan American (<http://www.utsystem.edu/institutions/university-texas-pan-american>)

The University of Texas of the Permian Basin (<http://www.utsystem.edu/institutions/university-texas-permian-basin>)

# Fields of Study

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- Architecture (p. 27)
- Business (p. 41)
- Communication (p. 67)
- Education (p. 86)
- Engineering (p. 123)
- Fine Arts (p. 188)
- Geosciences (p. 205)
- Information (p. 215)
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- Intercollegial Programs (p. 402)
- English As A Second Language (p. 407)

## School of Architecture

### For More Information

**Campus address:** Sutton Hall (SUT) 2.130, phone (512) 471-2398, fax (512) 471-0716; campus mail code: B7500

**Mailing address:** The University of Texas at Austin, School of Architecture, 310 Inner Campus Drive Stop B7500, Austin TX 78712-1009

**E-mail:** [soa\\_grad@austin.utexas.edu](mailto:soa_grad@austin.utexas.edu)

**URL:** <http://soa.utexas.edu/>

### Facilities for Graduate Work

The School of Architecture (<http://soa.utexas.edu>) is housed in four adjacent buildings at the heart of the campus: Battle Hall (<http://www.utexas.edu/maps/main/buildings/btl.html>) (1911) and Sutton Hall (<http://www.utexas.edu/maps/main/buildings/sut.html>) (1918, renovated in 1982), designed by the American architect Cass Gilbert; Goldsmith Hall (<http://www.utexas.edu/maps/main/buildings/gol.html>) (1933, expanded and renovated in 1988), designed by the French architect Paul Philippe Cret; and the West Mall Office Building (<http://www.utexas.edu/maps/main/buildings/wmb.html>) (1961) by the Texas firm Jessen, Jessen, Millhouse, and Greeven.

The Architecture and Planning Library (<http://www.lib.utexas.edu/apl>), a branch of the University of Texas Libraries, supports the School of Architecture by directly enhancing the value, relevance, and effectiveness of its teaching, research, and public service goals. The library, located in historic Battle Hall, also serves the public with ongoing exhibitions displayed in the grand reading room.

All students, faculty, and staff have convenient access to literature, information, and visual and digital resources that support education and research. While the library is located in close proximity to the school, its catalog, instructional guides, and digital content are web-based, allowing virtual discovery and access via the Internet. Staff provide expert information services that teach and develop research, as well as evaluative and critical thinking skills necessary for professional practice and lifelong learning. The Architecture and Planning Library is home to a large circulating collection, subject-specific journals, special collections of rare or unique publications, and the Alexander Architectural Archives (<http://www.lib.utexas.edu/apl/aaa>), one of the largest such repositories in the country. Materials currently collected by the library and archive meet the curricular needs of the school's programs and enable faculty and graduate students to undertake original research projects.

The Technology Lab and Service Desk (<http://soa.utexas.edu/technology-lab>) in Sutton Hall provide students with access to scanning, printing, and plotting systems as well as spaces for project assembly, collaboration, and presentation. In addition, students can check out digital cameras, digital video cameras, laptops, projectors, light meters, Hobo data recorders, or other useful digital tools. Students can also get help with their advanced design and analysis applications on their required personal computers at the Service Desk. The Digital Fabrication Lab (<http://soa.utexas.edu/resources/digital-fabrication>), also in Sutton Hall, provides access to a variety of digital fabrication tools for 3D scanning, 3D printing, laser cutting, and CNC routing. These tools provide the necessary capability for students to iterate their designs and analyses between physical and digital spaces and modeling processes. The computer classrooms in the West Mall Building double as open computer lab space when not in use for direct instruction, providing fifty-six dedicated workstations with the latest production, design, planning, and analysis software to accommodate the many disciplines of the school.

The Design Lab/Wood Shop (<http://soa.utexas.edu/resources/design-lab>), located in Goldsmith Hall, plays an integral role in the creation of design—ranging from models to full-scale applications—by providing equipment and training, primarily in wood, but also in metal, plastic, and glass.

The Center for Sustainable Development, (<http://www.soa.utexas.edu/csd>) located in the West Mall Building, is a multidisciplinary research center that leads the study and practice of sustainable development in Texas, the nation, and the world through complementary programs of research, education, and community outreach. The center hosts and supports a range of research and outreach activities of School of Architecture faculty and students. The center is unique in its integration of diverse interests to develop creative, balanced, and achievable solutions to the physical and social challenges facing the planning, construction, and preservation of buildings, neighborhoods, landscapes, and regions.

The Thermal Lab (<http://soa.utexas.edu/resources/thermal-lab>), the testing facility of the Center for Sustainable Development, simulates a full-scale room with a south-facing façade, allowing for the thermal experiments which include innovative applications in the fields of light control, ventilation, and the direct and indirect use of solar energy.

The Center for American Architecture and Design (<http://soa.utexas.edu/libraries-centers/center-american-architecture-design>) provides support and resources for the scholarly study of American architecture. Through lectures, exhibitions, seminars, symposia, fellowship support, and the collection of research materials, the center encourages architects, landscape architects, and others to collaborate. Regular scholarly publications of the center include *CENTER*, *Centerline*, and the *O'Neil Ford Monograph* and *Duograph* book series.

The Visual Resources Collection (VRC) (<http://soa.utexas.edu/resources/visual-resources-collection>), located in Sutton Hall, contains a growing collection of digital images—currently numbering over 140,000—for

use by faculty and students in support of teaching and research. The VRC circulates Nikon digital SLR cameras and ancillary photography equipment, manages a fully equipped black and white darkroom, and curates two exhibitions annually highlighting image collection content.

The University Co-op Materials Resource Center (<http://soa.utexas.edu/resources/matlab>), located in the remodeled third floor of the West Mall Building, houses the Materials Lab and Architecture Conservation Lab. It offers an inspirational environment to explore material systems, technologies, and preservation. The Materials Lab is dedicated to material investigation in design and maintains a circulating library of over 27,000 material samples. The collection consists of traditional building construction materials as well as emerging, innovative, and sustainable materials and technologies. Material education is further supported through exhibitions, workshops, field trips, and in-house research.

The Architectural Conservation Lab (<http://soa.utexas.edu/resources/conservation-lab>) is home to the Materials Conservation course series and provides a space for faculty and students to work on their own projects. Additionally, the space allows the Historic Preservation Program to establish affiliations with related facilities on the University campus, including the School of Information Book and Paper Conservation Labs and the Conservation Department at the Harry Ransom Center. The Architectural Conservation Lab was funded in part by a significant grant from the University Co-op.

A variety of other facilities support students in their coursework and professional development. The school's Career Services Center (<http://soa.utexas.edu/resources/career-services>) assists students with finding internships, identifying employment prospects, and preparing for interviews and negotiations with potential employers. The School of Architecture also provides access to a range of facilities and institutes across The University of Texas at Austin campus.

The School of Architecture has a close working relationship with the Lady Bird Johnson Wildflower Center (<http://www.wildflower.org>). The Wildflower Center conducts applied research on sustainable landscapes and ecosystem services, develops comprehensive educational materials, and consults on landscape development projects of all sizes to capitalize on the ability of sustainable landscapes to improve communities. These activities, in partnership with the American Society of Landscape Architects and the United States Botanic Garden, have contributed to guidelines in the Sustainable Sites Initiative (SITES) (<http://www.sustainablesites.org>).

The study of architecture, landscape architecture, and interior design draws upon the collections of the nearby Harry Ransom Center (<http://www.hrc.utexas.edu>), which include china, clothing, decorative arts, furniture, silver, and textiles that contribute to the study of the interior; as well as original maps, texts, and drawings that supplement the teaching of landscape history. Historic rooms and suites on campus include the Willoughby-Blake Room, the John Foster and Janet Dulles Suite, the Republic of Texas Suite, the Office of the President, and the Esther Hoblitzelle Parlor. Other collections on campus include the 15,000 pieces of art, furniture, and accessories in the Elton and Martha Hyder collection and the collection of approximately forty chairs dating from the seventeenth through twentieth centuries that are housed in the Blanton Museum of Art.

The resources of the Teresa Lozano Long Institute of Latin American Studies (<http://www.utexas.edu/cola/insts/llilas>) and the Benson Latin American Collection (<http://www.lib.utexas.edu/benson>), and the proximity of Austin to Latin America, provide exceptional opportunities for the study of Latin American architecture and planning. School of Architecture faculty and students also collaborate with the Environmental Science Institute, the School of Social Work, the Center for Transportation Research,

the Population Research Center, the Center for Research in Water Resources, the Bureau of Economic Geology, and other allied institutes.

In addition, the School of Architecture hosts the editorial offices of the *Journal of the American Planning Association* (<https://www.planning.org/japa>), a premier scholarly journal in the planning field.

## Architecture

*Master of Architecture*

*Master of Arts*

*Master of Science in Architectural Studies*

*Master of Science in Historic Preservation*

*Master of Science in Sustainable Design*

*Master of Science in Urban Design*

*Doctor of Philosophy*

## Areas of Study

### Master's Degrees

The School of Architecture (<http://soa.utexas.edu/programs/architecture>) offers master's degree programs that lead to professional, postprofessional, and academic degrees.

**Master of Architecture.** There are two Master of Architecture (<http://soa.utexas.edu/programs/architecture/architecture-graduate-degrees>) (MArch) programs. The MArch (first professional) degree program fulfills the professional degree requirements for registration as an architect. The MArch (postprofessional) degree program offers students with professional degrees in architecture the opportunity for advanced study in an area of concentration: advanced architectural design and theory, historic preservation, interdisciplinary studies, sustainable design, or urban design. The MArch postprofessional degree is not an NAAB accredited degree and does not fulfill the professional degree requirements for registration as an architect.

**Master of Arts.** The Master of Arts (<http://soa.utexas.edu/programs/architectural-history>) (MA) is an academic degree with a concentration in architectural history. It is a prerequisite for doctoral work in architectural history.

**Master of Science in Architectural Studies.** The MSAS (<http://soa.utexas.edu/programs/architecture/architecture-interdisciplinary-studies>) is an academic degree that offers a concentration in interdisciplinary studies, preparing students for careers in enhanced practice, research, or teaching.

**Master of Science in Historic Preservation.** The MSHP (<http://soa.utexas.edu/programs/historic-preservation>) is an academic degree that prepares students for practice or doctoral study in historic preservation.

**Master of Science in Sustainable Design.** The MSSD (<http://soa.utexas.edu/programs/sustainable-design>) is an academic degree that prepares students for doctoral study, practice-based research, work in public policy, or activism.

**Master of Science in Urban Design.** The MSUD (<http://soa.utexas.edu/programs/urban-design>) is an academic degree focusing on urban design with associated coursework in the disciplines of architecture, landscape architecture, and community and regional planning. The program is designed to help students develop the professional skills needed to engage in improving the quality and structure of the built environment.

## Doctor of Philosophy

The Doctor of Philosophy (<http://soa.utexas.edu/programs/architecture/architecture-graduate-degrees/doctor-philosophy>) is an academic degree with concentrations in the history of architecture and landscape architecture, historic preservation, and sustainability. It provides students holding an appropriate master's degree with a rigorous program of study intended to prepare them to conduct research and teach in these disciplines.

The concentration in the history of architecture and landscape architecture places special emphasis on understanding buildings or landscapes and their designers within their historical contexts as complex and interconnected wholes that include aspects of aesthetics, tectonics, function, culture, and meaning. The student's program of study may address the history of architectural theory; the history of design; the history of interior design; the history of urban design, settlements, or cities; the history of building technology; and the history of landscape design.

The concentration in historic preservation embraces multi-disciplinary and culturally diverse approaches to the conservation of historic resources. The student's program may address preservation planning and development; issues in the theory, history, and practice of the conservation of buildings, interiors, landscapes and neighborhoods; preservation-based strategies of sustainable development; and innovative methodologies for preservation practice.

The concentration in sustainability is practical, technical, and philosophical in scope and integrates three areas of inquiry related to the built environment: biophysical systems, building systems, and political systems. The study of biophysical systems relies upon the disciplines of natural and urban ecological sciences as they relate to architecture. The study of building systems includes investigating component technologies necessary to construct environmentally responsive architecture. The study of political systems situates the biophysical and building systems within the social and political contexts of architectural practice.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Dean J Almy	Michael Holleran
Anthony Alofsin	Benjamin Ibarra Sevilla
Kevin S Alter	Fernando Luiz Lara
Simon D Atkinson	Petra Gabriele Liedl
Michael L Benedikt	Christopher A Long
Miroslava M Benes	Sarah L Lopez
Kory Bieg	S Milovanovic-Bertram
James Sinclair Black	Juan Miro
Danelle I Briscoe	Steven A Moore
Richard L Cleary	Michael Oden
Ulrich C Dangel	Clay Odom
Elizabeth A Danze	Allan W Shearer
Gabriel Diaz Montemayor	Igor P Siddiqui
Larry A Doll	Vincent L Snyder
Matthew L Fajkus	Lawrence W Speck
Nerea Feliz Arrizabalaga	Frederick R Steiner
Michael L Garrison	Danilo F Udovicki
Tamie Michele Glass	Wilfried Wang
Francisco H Gomes	Nichole Wiedemann
David D Heymann	

## Admission Requirements

Upon admission to the program, the student must pay a nonrefundable enrollment deposit to indicate that he or she accepts the offer of admission. The deposit is applied to the payment of tuition when the student enrolls. The deposit is also required of students admitted to dual degree programs.

**Master of Architecture (first professional).** This degree program (<http://soa.utexas.edu/apply/graduate-admissions/application-instructions/master-architecture-first-professional>) is open to qualified applicants who hold baccalaureate degrees in any discipline, including pre-architecture. Prerequisites include one semester of college-level calculus and one semester of college-level physics for non-technical majors (non-calculus based).

**Master of Architecture (postprofessional).** This degree program (<http://soa.utexas.edu/apply/graduate-admissions/application-instructions/master-architecture-post-professional>) is open to qualified applicants who hold a professional 5-year baccalaureate degree in architecture from an NAAB accredited school or its international equivalent. The MArch postprofessional degree is not an NAAB accredited degree. International students interested in pursuing licensure in the United States should instead apply to the Master of Architecture (first professional) degree.

**Master of Arts.** This degree program (<http://soa.utexas.edu/apply/graduate-admissions/application-instructions/master-arts-architectural-history>) in architectural history is open to qualified applicants who hold baccalaureate degrees in any discipline. Prerequisites include twelve hours of architectural history, which may include courses in art history, history, or related subjects, and design experience. The design requirement may be satisfied by coursework or by evidence of previous fieldwork or professional architectural experience.

**Master of Science in Architectural Studies.** This degree program (<http://soa.utexas.edu/apply/graduate-admissions/application-instructions/master-science-architectural-studies>) is open to qualified applicants who hold baccalaureate degrees in any discipline. Prerequisites for students without architecture degrees vary according to the student's experience and intended area of inquiry.

**Master of Science in Historic Preservation.** This degree program (<http://soa.utexas.edu/apply/graduate-admissions/application-instructions/master-science-historic-preservation>) is open to qualified applicants who hold baccalaureate degrees in any discipline. Prerequisites include at least one three-semester-hour course in architectural history as well as design experience. The design requirement may be satisfied by coursework or by evidence of previous fieldwork or professional architectural experience.

**Master of Science in Sustainable Design.** This degree program (<http://soa.utexas.edu/master-science-sustainable-design>) is open to qualified applicants who hold baccalaureate degrees in any discipline. Prerequisites include at least one three-semester-hour course in modern architectural history.

**Master of Science in Urban Design.** This degree program (<http://soa.utexas.edu/apply/graduate-admissions/application-instructions/master-science-urban-design>) is open to qualified applicants who hold professional degrees in architecture or landscape architecture, or baccalaureate degrees in any discipline. Prerequisites for students without degrees in architecture or landscape architecture vary according to the student's experience and intended concentration.

**Doctor of Philosophy.** Students who enter the doctoral degree program (<http://soa.utexas.edu/apply/graduate-admissions/application-instructions/phd-architecture>) must hold a master's degree or the equivalent in a

discipline relevant to their area of concentration and must demonstrate the ability to excel in doctoral work. Admission decisions are made by the doctoral subcommittee of the Architecture Graduate Studies Committee.

## Degree Requirements

### Master of Architecture

#### Professional Degree Program

The Master of Architecture (<http://soa.utexas.edu/programs/architecture/architecture-graduate-degrees/master-architecture-first-professional>) is an accredited first professional degree, with graduate professional courses designed to prepare the student for advanced work in architecture and to apply for registration with the National Council of Architectural Registration Boards (NCARB) as an architect in the United States.

The coursework required is prescribed individually on the basis of the student's previous college work as shown by transcripts, the portfolio, the statement of intent, and references. For students entering with degrees other than professional degrees in architecture, the professional degree program requires at least sixty semester hours of prescribed coursework. For students entering with a professional degree in architecture (B.Arch.), a minimum of forty-eight hours of prescribed coursework is required.

Before progressing into the advanced architectural design sequence, all Master of Architecture professional degree candidates must demonstrate proficiency in design and communication through a qualifying portfolio review conducted by the faculty. Students entering without a background in architecture normally complete the professional degree program in approximately three and one-half years of study in residence; the academic records of students holding preprofessional bachelors degrees (i.e. in architectural studies) are individually evaluated for course credit toward the professional degree program requirements.

Students may earn a Certificate of Specialization in Historic Preservation, Latin American Architecture, Sustainable Design, or Urban Design by completing the relevant sequence of courses. Additional information is available from the graduate adviser.

#### Postprofessional Degree Programs

For students entering with a professional degree in architecture, the Master of Architecture is a postprofessional (<http://soa.utexas.edu/programs/architecture/architecture-graduate-degrees/master-architecture-post-professional>) degree. It requires either thirty semester hours of graduate work, including the six-hour thesis; or thirty-six hours of work, including a final six hours of master's design study or a terminal design studio. Based on the student's interests and an evaluation of the statement of intent, portfolio, and transcripts, specific degree requirements are established for the postprofessional program offerings:

- *Design and Theory*: A postprofessional program (<http://soa.utexas.edu/programs/architecture/architecture-graduate-degrees/m-arch-ii/architectural-design>) providing an opportunity to examine and refine design philosophies and techniques. Participants may develop an individual program of study based on their specific design interests.
- *Historic Preservation*: A postprofessional program (<http://soa.utexas.edu/programs/architecture/architecture-graduate-degrees/m-arch-ii/historic-preservation>) designed to provide knowledge and skills appropriate for architects who are engaged in preservation practice and policy, written and graphic documentation of historic structures, building pathology, materials conservation, and sensitive design for restoration or adaptive reuse.
- *Interdisciplinary Studies*: Postprofessional graduate study (<http://soa.utexas.edu/interdisciplinary-studies>) aimed at acquiring and

integrating knowledge from specific fields outside of architecture into the practice of architecture.

- *Sustainable Design*: A postprofessional program (<http://soa.utexas.edu/programs/architecture/architecture-graduate-degrees/m-arch-ii/sustainable-design>) emphasizing the integration of natural systems, building systems, and cultural systems into architectural design.
- *Urban Design*: Postprofessional graduate study (<http://soa.utexas.edu/programs/architecture/architecture-graduate-degrees/m-arch-ii/urban-design>) designed to develop the student's understanding of the urban environment and its users' needs, and to promote the design skills he or she needs to improve the quality and efficiency of city life.

### Master of Arts

The degree program (<http://soa.utexas.edu/programs/architectural-history>) consists of at least thirty semester hours of coursework, including a thesis. Students must demonstrate reading knowledge of French, Spanish, German, or another language appropriate to their area of study. An individual plan of study is defined for each student by the program director.

### Master of Science in Architectural Studies

The Master of Science in Architectural Studies degree program (<http://soa.utexas.edu/programs/architecture/architecture-interdisciplinary-studies>) consists of advanced academic work with a focus on interdisciplinary studies. This degree program is tailored to applicants who wish to pursue research and advanced academic study. It is available to students with or without a professional degree in architecture.

The program requires at least thirty semester hours of work and includes a thesis. An individual plan of study is defined for each student by the program director.

This degree does not fulfill the professional degree requirements for registration as an architect.

### Master of Science in Historic Preservation

The degree program (<http://soa.utexas.edu/programs/historic-preservation>) consists of at least forty-eight semester hours of coursework, including a thesis, professional report, or coursework-only option. An individual plan of study is defined for each student by the program director.

### Master of Science in Sustainable Design

The degree program (<http://soa.utexas.edu/programs/sustainable-design>) consists of at least forty-two semester hours of work, including a thesis or professional report. Up to twenty-four semester hours of coursework may be chosen in the student's area of concentration. An individual plan of study is defined by each student in conjunction with the program director.

### Master of Science in Urban Design

The degree program (<http://soa.utexas.edu/programs/urban-design>) requires at least thirty-six semester hours of work, including either a terminal design studio or a thesis. Additional hours may be required for students without a prior degree in either architecture or landscape architecture. An individual plan of study is defined for each student by the program director.

### Doctor of Philosophy

The doctoral subcommittee of the Architecture Graduate Studies Committee determines course requirements, prescribes qualifying

examinations, and approves dissertation topics. The degree (<http://soa.utexas.edu/programs/architecture/architecture-graduate-degrees/doctor-philosophy>) plan requires a minimum of thirty semester hours. These include twenty-one semester hours of seminars, independent research, and reading courses leading to the qualifying examination. Nine of these hours must satisfy the program's core requirements, as specified by the doctoral subcommittee (credit may be awarded for core courses taken as part of a School of Architecture master's program). After passing the qualifying examination, the student registers for a three-semester-hour dissertation colloquium to develop a dissertation topic. Continuous registration is required through the writing, oral defense, revision, and final acceptance of the dissertation. All tracks require experience in design, which may be gained through design studio coursework or professional practice, reading proficiency in two foreign languages, and/or proficiency in qualitative or quantitative analysis as determined by the doctoral subcommittee.

## Dual Degree Programs

The following dual degree programs are offered within the School of Architecture. More information is available from the graduate adviser in each program.

Field(s) of Study	Degree(s)
Community and regional planning	Master of Science in Community and Regional Planning
Sustainable design	Master of Science in Sustainable Design
Community and regional planning	Master of Science in Community and Regional Planning
Urban design	Master of Science in Urban Design

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Architecture: ARC

#### ARC 180R. Proseminar in Architecture.

Study of theories related to design, livability, and sustainability in the built environment. Includes collaboration with other students and research. One lecture hour a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and admission to the Master of Architecture (postprofessional) degree program.

#### ARC 381F. Digital Drawing and Fabrication.

Focus on advanced visual communication methodologies necessary for architectural generation, translation, and output. Five laboratory hours a week for one semester. Architecture 381F and 381R (Topic: Digital Drawing and Fabrication) may not both be counted. Prerequisite: Graduate standing and consent of the graduate adviser.

#### ARC 381R. Advanced Visual Communication.

Advanced topics in visual communication in such media as freehand drawing, modeling, photography, computer graphics, photogrammetry, and measured drawings. Five laboratory hours a week for one semester. With consent of the graduate adviser, may be repeated for credit when the

topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

#### ARC 381T. Technical Communication.

Studio to provide skills in producing construction documents as they relate to the design and building process. Six laboratory hours a week for one semester. Prerequisite: Graduate standing, Architecture 385N, 694 (or 393 and 394), concurrent enrollment in Architecture 695, and consent of the graduate adviser.

#### ARC 381W. Visual Communication Workshop.

Introductory workshop with a focus on developing graphic and basic design skills for the purpose of describing and communicating architectural ideas and form. Exposure to a diverse range of approaches involving freehand drawing, architectural graphic conventions, three-dimensional modeling of ideas, and an introduction to the design process. Five laboratory hours a week for one semester. Architecture 381R (Topic: Visual Communication Workshop) and 381W may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### ARC 382. Professional Practice.

Ethical, legal, economic, and administrative processes and responsibilities of the practitioner in architecture and allied fields. Topics may include preservation law, community development, participatory design, and other aspects of organizations; methods and roles in design, planning, and preservation of the built environment. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

#### ARC 383S. Site Design.

Fundamentals of building and landscape relationships. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

#### ARC 383T. Site, Landscape, and Urban Studies.

Topics in the history, design, and preservation of building sites, landscapes, and rural and urban communities. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

#### ARC 384K. Environmental Control I.

Survey of acoustics, color, light, illumination, and electrical and information systems in architectural interiors. Includes techniques of documentation. Three lecture hours and one laboratory hour a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

#### ARC 384L. Environmental Control II.

Survey of heating, ventilating, air conditioning, vertical transportation, and plumbing systems in buildings. Includes techniques of documentation. Three lecture hours and one laboratory hour a week for one semester. Prerequisite: Graduate standing, Architecture 384K with a grade of at least C, and consent of the graduate adviser.

#### ARC 384T. Topics in Building and Environment Studies.

Topics include daylighting and the history of building technology. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **ARC 385K. Construction I.**

Introduction to building construction, materials, and structures. Three lecture hours and three laboratory hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### **ARC 385L. Construction II.**

Analysis of building assemblies and materials, envelope design, and structures. Three lecture hours and three laboratory hours a week for one semester. Prerequisite: Graduate standing, Architecture 385K with a grade of at least C, Mathematics 408C or the equivalent with a grade of at least C, Physics 302K with a grade of at least C, and consent of the graduate adviser.

### **ARC 385M. Construction III.**

Theories of building construction and materials; structural component analysis and design. Three lecture hours and three laboratory hours a week for one semester. Prerequisite: Graduate standing, Architecture 385L with a grade of at least C, and consent of the graduate adviser.

### **ARC 385N. Construction IV.**

Theories of building behavior and materials; structural system analysis and design. Three lecture hours and three laboratory hours a week for one semester. Prerequisite: Graduate standing, Architecture 385M with a grade of at least C, and consent of the graduate adviser.

### **ARC 385T. Topics in Building Construction and Conservation.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **ARC 386K. Theory of Architecture I.**

Examines how architecture carries meaning. Uses case studies of buildings constructed in the past forty years. Three lecture hours a week for one semester. Prerequisite: Graduate standing and admission to the graduate program in architecture or architectural studies.

### **ARC 386L. Theory of Architecture II.**

Survey of architectural theory since the Renaissance. Three lecture hours a week for one semester. Prerequisite: Graduate standing and admission to the graduate program in architecture or architectural studies.

### **ARC 386M. Topics in Architectural Theory.**

Study of critical theories and practices that affect the built environment. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **ARC 387F. World Architecture: Origins to 1750.**

Introduction to architectural types, principles, and building technologies from prehistory to the mid-eighteenth century. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### **ARC 387G. World Architecture: The Industrial Revolution to the Present.**

Examination of architecture types, principles, and building technologies with special attention to cultural transfers. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Architecture 387F with a grade of at least C, and consent of the graduate adviser.

### **ARC 388R. Topics in the History of Architecture and Historic Preservation.**

Seminars and lecture/seminars on advanced topics in architectural history, historic preservation, and the history of building technology.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser; additional prerequisites vary with the topic.

### **ARC 389, 689. Research in Architecture.**

Investigation of problems in architecture, urban design, and development selected by the student with approval of the Graduate Studies Committee. Three or six lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### **ARC 189R. Architectural Research.**

Investigation of problems selected by the student with approval of the supervising faculty member. One studio hour a week for one semester. May be repeated for credit. Prerequisite: Graduate standing.

### **ARC 190C, 390C. Architecture Practicum.**

Restricted to students in the following programs: Master of Architecture (first professional), Master of Architecture (post-professional), Master of Science in Sustainable Design, Master of Science in Urban Design, Master of Arts in Architectural History, Master of Science in Historic Preservation, Master of Science in Architectural Studies. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester, with additional hours to be arranged. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, and written consent of the graduate adviser and chair of the Architecture Graduate Studies Committee.

### **ARC 690H. Master's Design Studio--Dual Degree.**

Restricted to dual degree students. Advanced study in architecture, addressing complex design problems and issues related to various architectural topics. The equivalent of nine laboratory hours a week for two semesters. Prerequisite: Graduate standing and consent of the graduate adviser.

### **ARC 690J. Urban Design Project: Dual Degree.**

Restricted to Master of Science in Community and Regional Planning and Master of Science in Urban Design dual degree students. Research project in urban design. The equivalent of three lecture hours a week for two semesters. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### **ARC 391C. Urban Design History, Theory, and Criticism.**

Study of critical theories and practices that affect the built environment. Three lecture hours a week for one semester. Architecture 386M (Topic: Urban Design History/Theory/Criticism) and 391C may not both be counted. Prerequisite: Graduate standing and consent of the graduate adviser.

### **ARC 692K. Historic Preservation Studio.**

Interdisciplinary studio integrating design and other preservation issues at scales from interiors to landscapes and urban districts. The equivalent of fifteen laboratory hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing.

### **ARC 693K. Urban Design Studio.**

Interdisciplinary studio integrating urban design at scales from interiors to landscapes and urban districts. The equivalent of fifteen laboratory hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing.

### **ARC 694. Architectural Design: Vertical Studio.**

Design problems dealing with subjective and objective decision making, study and application of drawing and other communication skills for architects, investigation of physical and social contexts, and the practical requirements of sound building. The equivalent of fifteen laboratory hours



a week for one semester. Architecture 393 and 694 may not both be counted. Architecture 394 and 694 may not both be counted. Prerequisite: Graduate standing and consent of the graduate adviser.

### **ARC 695. Advanced Architectural Design: Comprehensive Studio.**

Comprehensive advanced studio to develop skills in assimilating concepts into a feasible building design. Fifteen laboratory hours a week for one semester. Prerequisite: Graduate standing, Architecture 694 (or 393 and 394), concurrent enrollment in Architecture 381T, and consent of the graduate adviser.

### **ARC 395C. Mexican Architecture and Urbanism: From Pre-Columbian to Contemporary.**

A survey of Mexican architecture and urbanism from its origins in pre-Columbian times to the twenty-first century. Evaluation of architecture as a cultural production intricately connected to its artistic and historical context and the landscape that supports it. Three lecture hours a week for one semester. Architecture 388R (Topic: Mexican Architectural History) and 395C may not both be counted. Prerequisite: For students in the School of Architecture, graduate standing; for all others, graduate standing and consent of instructor.

### **ARC 395D. Frank Lloyd Wright: Design, Method, Theory.**

Comprehensive study of Frank Lloyd Wright's life and work with emphasis on the analyses of his concepts of organic architecture, design methods, and theories. Three lecture hours a week for one semester. Architecture 388R (Topic: Frank Lloyd Wright) and 395D may not both be counted. Offered on the letter-grade basis only. Prerequisite: For students in the School of Architecture, graduate standing; for all others, graduate standing and consent of instructor.

### **ARC 395E. History and Theories of Landscape Architecture I.**

Overview and chronological series of in-depth studies in the history of major garden cultures and designed landscapes of the Western and Eastern worlds. Introduction to methodological approaches to the formal, social, and cultural history of gardens and landscapes, as well as to relevant theoretical frameworks for interpreting these designed landscapes and for use in conceptualizing landscapes, architecture, and urban projects in studio design. Three lecture hours a week for one semester. Architecture 388R (Topic: History and Theories of Landscape Architecture I) and 395E may not both be counted. Prerequisite: Graduate standing and consent of the graduate adviser.

### **ARC 395F. History and Theories of Landscape Architecture II.**

Continuation of Architecture 395E through the modern period and contemporary times. Formal and cultural history of gardens, parks, and public landscapes from 1700 to about 1990. Includes comparative material from the contemporary period, 1980 to 2010. Three lecture hours a week for one semester. Architecture 388R (Topic: History and Theories of Landscape Architecture II) and 395F may not both be counted. Prerequisite: Graduate standing and consent of the graduate adviser.

### **ARC 696. Advanced Architectural Design.**

Advanced problems in architectural design to help develop skills in areas of students' and faculty member's choice, including interior architecture and preservation, as well as landscape, urban, and sustainable design. The equivalent of fifteen laboratory hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, Architecture 694 or the equivalent, and consent of the graduate adviser.

### **ARC 697. Master's Design Studio.**

Forum for advanced study in architecture, addressing complex design problems and issues related to various architectural topics. The equivalent of eighteen laboratory hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **ARC 397K. Doctoral Research in Architecture.**

Conference course for students preparing for the dissertation colloquium. Conference course. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in architecture and consent of the graduate adviser.

### **ARC 697U. Urban Design Project.**

Restricted to urban design students. Research project in urban design. The equivalent of six lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### **ARC 698. Thesis.**

For students seeking the Master of Science or Master of Arts degrees in the School of Architecture, those seeking the Master of Architecture as a postprofessional degree, and those seeking the Master of Architecture as a first professional degree who choose to complete the requirements of a concentration. The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in architecture and consent of the graduate adviser; for 698B, Architecture 698A.

### **ARC 398D. Departmental Report.**

Preparation of a degree project to fulfill the requirement for the Master of Science in Historic Preservation or other School of Architecture degree program under the departmental report option. May be taken for a single semester (similar to the Professional Report), or two semesters (similar to the Thesis). The equivalent of three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### **ARC 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in architectural studies and consent of the graduate adviser.

### **ARC 398T. Supervised Teaching in Architecture.**

Designed to orient the beginning teacher in effective methods of teaching architecture and related topics. Three lecture hours a week for one semester. Required for assistant instructors in architecture. Prerequisite: Graduate standing and consent of the graduate adviser.

### **ARC 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and written consent of the graduate adviser.

### **ARC 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Architecture 399R, 699R, or 999R, and written consent of the graduate adviser.

# Community and Regional Planning

*Master of Science in Community and Regional Planning  
Doctor of Philosophy*

## Areas of Study

In conjunction with completion of the core portion of the curriculum, students may choose to specialize in a field within urban planning (<http://soa.utexas.edu/programs/community-and-regional-planning>). An official specialization requires completion of a minimum of four elective courses plus a thesis or professional report within the chosen field. Areas of specialization (<http://soa.utexas.edu/programs/community-and-regional-planning/specializations>) include social and economic equity; environmental planning; land use, transportation and infrastructure; urban design and development; and historic preservation. Students can also pursue specialized interests through dual degree programs, which are described under Degree Requirements (<http://soa.utexas.edu/programs/community-and-regional-planning/dual-degree-programs>). Selection of an official field of specialization is not a requirement of the degree program. Students may instead choose to tailor the choice of elective courses to their specific interests.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Dean J Almy	Sandra Rosenbloom
Sarah Eileen Dooling	Allan W Shearer
Michael Holleran	Bjorn I Sletto
Junfeng Jiao	Frederick R Steiner
Talia M McCray	Jacob A Wegmann
Steven A Moore	Patricia A Wilson
Elizabeth Mueller	Robert F Young
Michael Oden	Ming Zhang
Robert G Paterson	

## Admission Requirements

**Master of Science in Community and Regional Planning.** There are no specific course prerequisites for admission to the master's degree program (<http://soa.utexas.edu/apply/graduate-admissions/application-instructions/master-science-community-and-regional-planning>). However, facility in basic computer skills (using spreadsheets and word processing) is assumed.

**Doctor of Philosophy.** To be admitted to the doctoral program (<http://soa.utexas.edu/apply/graduate-admissions/application-instructions/phd-community-and-regional-planning>), an applicant must have a master's degree in community and regional planning or a related field.

To be admitted to any of the dual degree programs, the applicant must be admitted to each of the individual participating programs.

For more information about admission to the master's or doctoral degree program or to any of the dual degree programs, consult the graduate adviser in care of the program or the community and regional planning Web site (<http://soa.utexas.edu/programs/community-and-regional-planning>).

Upon admission to the program, the student must pay a nonrefundable enrollment deposit to indicate that he or she accepts the offer of admission. The deposit is applied to the payment of tuition when the

student enrolls. The deposit is also required of students admitted to the dual degree programs.

## Degree Requirements

### Master of Science in Community and Regional Planning

Each student must complete forty-eight semester hours of coursework, including introductory courses in planning history, theory, and ethics; quantitative planning methods; qualitative and participatory planning methods; sustainable land use planning; GIS and visual planning tools; planning law; and financing public services. The student may then choose an area of specialization; for each specialization, at least four courses are required. During the final year, the student synthesizes his or her educational experience by taking an integrative planning studio and completing either a thesis or a professional report. With the assistance of the graduate adviser, each student develops an individual program based on his or her interests; each program of study must include at least thirty semester hours in community and regional planning or acceptable substitutes.

### Doctor of Philosophy

The doctoral degree requires forty-eight semester hours of work, including graduate coursework, directed research, and the dissertation. Each doctoral student must specialize in a planning field, such as environmental and natural resources planning, land development and urban design, housing and community economic development, land use and infrastructure planning (including transportation), historic preservation (through cross-listed architecture courses), or a special field defined by the supervisor and the student and approved by the community and regional planning PhD Committee. In addition, doctoral students must complete advanced work in an outside field; a variety of supporting (outside) fields are available through other University programs. Depth and breadth of experience in planning theory and research design and methods are required of all doctoral students.

After completing the required coursework, the student advances to candidacy according to procedures set by the Graduate Studies Committee. Advancement to candidacy involves an evaluation of the student's research proposal and a comprehensive written examination. A faculty committee evaluates the research in progress, and reads the dissertation.

### Dual Degree Programs

The community and regional planning program offers the following dual degree programs in cooperation with other divisions of the University. More information is available from the graduate adviser in each program.

Field	Degree
Geography	Doctor of Philosophy
Latin American studies	Master of Arts
Law	Doctor of Jurisprudence
Public affairs	Master of Public Affairs

In addition, the following dual degree programs are offered within the School of Architecture. More information is available from the graduate adviser in each program.

Field	Degree
Sustainable design	Master of Science in Community and Regional Planning/Master of Science in Sustainable Design

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Community and Regional Planning: CRP

#### CRP 380C. Theoretical and Historical Foundations of Planning.

Historical and conceptual foundations of the field. Three lecture or seminar hours per week for one semester. Prerequisite: Graduate standing.

#### CRP 381. Legal and Economic Foundations of Planning.

Land use and other areas of law related to urban planning; public finance, public economics, and political economy. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Financing Public Services.** Restricted to students admitted to the community and regional planning graduate program.

**Topic 2: Planning Law.** Restricted to students admitted to the community and regional planning program.

**Topic 3: Preservation Law.**

**Topic 4: Growth Management.**

**Topic 5: Dispute Resolution.**

**Topic 7: Neighborhood Participatory Planning.**

**Topic 8: Deep Democracy: Dialogue of Exchange.**

**Topic 9: Environmental Policy and Law.**

#### CRP 381M. Foundational Methods in Planning.

Restricted to students admitted to the Community and Regional Planning program. Three lecture hours a week for one semester. May be repeated for credit when the topics vary.

**Topic 1: Quantitative Methods.** Community and Regional Planning 381M (Topic 1) and 386 (Topic 2) may not both be counted.

**Topic 2: Qualitative and Participatory Methods.** Community and Regional Planning 381 (Topic: Participatory Methods in Community Planning) and 381M (Topic 2) may not both be counted. Prerequisite: Community and Regional Planning 381M Quantitative Methods (Topic 1).

#### CRP 382C. Physical Planning and Design.

Subjects may include place-making, landscape and urban design, and physical planning and design at the national, regional, or local level. Three lecture hours a week for one semester. Some topics may require additional studio hours. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Urban Design Practice.**

**Topic 2: Design for Planners I.**

**Topic 3: Design for Planners II.**

**Topic 4: Urban Land Institute Workshop.**

**Topic 5: Garden City to New Community.**

**Topic 6: Urban Landscapes and Place-Making.**

**Topic 7: Spatial Analysis and Design.**

**Topic 8: Planning Studio for Landscape and Urban Design.**

**Topic 9: Social Life of Public Places.**

**Topic 10: Principles of Physical Planning.**

**Topic 11: The Future: Views in Planning.**

**Topic 12: Geodesign.**

#### CRP 383. Environment and Natural Resources.

Seminars and workshops on subjects including environmental and ecological analysis and planning topics. Workshops are based on active research or cooperation with public or private clients. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Techniques in Environmental Analysis.**

**Topic 2: Coastal Zone Planning.**

**Topic 3: Environmental Impact Assessment.**

**Topic 4: Disasters and Resilience: Planning and Response.**

**Topic 5: Natural Resources and Environmental Planning Workshop.**

**Topic 6: Urban Environmental Analysis.**

**Topic 7: Introduction to Urban Ecology.**

**Topic 8: Basic Ecology for Designers and Planners.**

**Topic 9: Environmental Readings.**

**Topic 10: Planning for Megaregions.**

**Topic 11: Aesthetics and Ecology.**

#### CRP 384. Transportation.

Neighborhood, city, and regional transportation policy and practice. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of graduate adviser.

**Topic 1: Urban Transportation Planning.**

**Topic 2: Neighborhood Transportation Planning.**

**Topic 3: Planning for Accessibility.**

**Topic 4: Land Use and Transportation Planning.**

**Topic 5: International Transportation Issues.**

**Topic 6: Metropolitan Transportation Studies with Geographic Information Systems.**

**Topic 7: Transit-Oriented Development.**

**Topic 8: Transportation, Access, and Equity.**

#### CRP 385C. Economic and Community Development.

Seminars and workshops on subjects including theory and analysis of social and economic sustainability of communities and regions and community led responses and initiatives. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Urban and Regional Theory.**

**Topic 2: Urban Economic Development Policy.**

**Topic 3: Sustainable Urban Economic Development Planning.**

**Topic 4: Community Development.**

**Topic 5: Development and Planning in Latin America.**

**Topic 6: International Sustainable Social Development.**

**Topic 7: Social, Spatial, and Environmental Justice.**

**Topic 8: Built Environment and Public Health.**

**Topic 9: Sustainable Cities.**

**Topic 11: City and Regional Planning in Texas.**

**Topic 12: Building a Sustainable Region.**

**Topic 15: Migratory Urbanism.**

#### CRP 685D. Planning Studio.

An integrative and comprehensive planning studio project course, involving application of theory, research, fieldwork, and oral, graphic, and written communication. Six lecture hours and four laboratory hours a week

for one semester. With consent of the graduate adviser, may be repeated for credit. Prerequisite: Graduate standing.

### **CRP 386. Applied Planning Techniques.**

Quantitative and qualitative methods of planning analysis, spatial analysis and mapping, and visual communication techniques. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of graduate adviser.

**Topic 1: Quantitative Methods.** Restricted to students admitted to the community and regional planning program.

**Topic 2: Applied Methods.** Restricted to students admitted to the community and regional planning program. Additional prerequisite: Community and Regional Planning 386 (Topic 1).

**Topic 3: Data Sources and Analysis.** Major sources and types of data available in the public and private domains; data analysis and applications.

**Topic 4: Qualitative Research Methods.**

**Topic 5: Urban Geographic Information Systems.**

**Topic 6: Introduction to Visual Communications and Geographic Information Systems for Planners.** Restricted to students admitted to the community and regional planning program.

**Topic 7: Planning Studio for Landscape and Urban Design.**

**Topic 8: Research Design.**

**Topic 9: Sustainable Land Use Planning.**

**Topic 10: Agenda 21: Sustainable Urbanism.**

### **CRP 387C. Infrastructure Planning.**

Policy and techniques for providing soft and hard urban infrastructure; infrastructure planning and analysis. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Infrastructure Planning and Development.**

**Topic 2: Water Resources Planning.**

**Topic 3: Urban Parks and Open Space Planning.**

**Topic 5: Urban Agricultural Systems.**

**Topic 6: Resource Management and Recycling.**

### **CRP 388. Housing.**

Planning and housing policies and programs related to production and access to housing; community strategies for meeting housing needs. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Housing Demand and Production.**

**Topic 2: Housing and Culture.**

**Topic 3: Affordable Housing Planning and Policy.**

**Topic 4: Affordable Housing Development and Design.**

**Topic 5: Housing Practice and Public Policy in Latin America.**

### **CRP 389C. Land Use and Land Development.**

Analysis of land use patterns, planning principles, and strategies for achieving sustainability goals, and private land development principles and practices. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Planning for Land Development.**

**Topic 2: Research in Land Development.**

**Topic 3: Landscape and Culture.**

**Topic 4: Images of the City.**

### **CRP 390. Conference Course in Community and Regional Planning.**

Readings and case studies in current topical issues in planning and planning education. Conference course. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **CRP 391D. Doctoral Seminar.**

Advanced theory and research methodology. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the community and regional planning doctoral program.

**Topic 1: Colloquium on Planning Issues.**

**Topic 2: Planning Theory Seminar.**

**Topic 3: Research Methodology Seminar.**

### **CRP 392C. Historical Preservation.**

Includes topics in architectural history, with a focus on the twentieth century and Modernism; architectural conservation; preservation planning and cultural resource management; and design. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: History of American City Building.** Only one of the following may be counted: Architecture 388R (Topic: History of American City-Building), Community and Regional Planning 389C (Topic: History of American City-Building), 392C (Topic: History of American City-Building), 392C (Topic 1).

**Topic 2: Preservation History and Theory.**

**Topic 3: National Registry of Historic Places Documentation.**

**Topic 4: Research Seminar in Sustainable Preservation.**

**Topic 5: Historic Preservation: Planning and Practice.**

### **CRP 395C. Planning Studio.**

An integrative and comprehensive planning studio project course, involving application of theory, research, fieldwork, and oral, graphic, and written communication. Three lecture hours and two laboratory hours a week for one semester. With consent of the graduate adviser, may be repeated for credit. Prerequisite: Graduate standing and consent of the graduate adviser.

### **CRP 395D. Planning Studio.**

Continuation of Community and Regional Planning 395C. Three lecture hours and two laboratory hours a week for one semester. With consent of the graduate adviser, may be repeated for credit. Prerequisite: Graduate standing, Community and Regional Planning 395C, and consent of the graduate adviser.

### **CRP 396. Independent Research in Community and Regional Planning.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### **CRP 397. Planning Internship.**

Includes placement with a public or private planning agency, faculty supervision, and presentation of report. Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### **CRP 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in community and regional planning and consent of the graduate adviser; for 698B, Community and Regional Planning 698A.

### **CRP 398R. Master's Professional Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in community and regional planning and consent of the graduate adviser.

### **CRP 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **CRP 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Community and Regional Planning 399R, 699R, or 999R.

## **Interior Design**

*Master of Interior Design*

### **Areas of Study**

The two master's degree programs in interior design lead to professional and postprofessional academic degrees.

The Master of Interior Design (first professional) may qualify (<http://accredit-id.org/students-parents/faqs>) graduates to become licensed or registered as an interior designer. Interested students are encouraged to confirm requirements (<http://www.iida.org/content.cfm/state-licensing-guide>) for the state in which they hope to practice and confirm NCIDQ eligibility requirements (<http://www.ncidqexam.org/exam/eligibility-requirements>).

The Master of Interior Design (postprofessional) degree offers students advanced studies, theory, and research for those holding a prior professional degree in interior design or architecture.

For more information, visit the interior design Web site (<http://soa.utexas.edu/programs/interior-design>).

### **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Elizabeth A Danze	Christopher A Long
Nerea Feliz Arrizabalaga	Clay Odom
Tamie Michele Glass	Igor P Siddiqui

### **Admission Requirements**

Upon admission to the program, the student must pay a nonrefundable enrollment deposit to indicate that he or she accepts the offer of admission. The deposit is applied to the payment of tuition when the student enrolls.

**Master of Interior Design (first professional).** This degree program (<http://soa.utexas.edu/programs/interior-design/master-interior-design-mid/first-professional-mid>) is open to qualified applicants who hold baccalaureate degrees in any discipline without a prior professional degree in interior design or architecture.

**Master of Interior Design (postprofessional).** This degree program (<http://soa.utexas.edu/programs/interior-design/master-interior-design-mid/post-professional-mid>) is open to qualified applicants with a prior professional baccalaureate degree in interior design or architecture.

## **Degree Requirements**

### **Master of Interior Design (first professional)**

For students entering with degrees other than professional degrees in interior design or architecture, the Master of Interior Design is a first professional degree, with accelerated graduate professional courses designed to prepare the student for advanced work in interior design; the coursework is prescribed on the basis of the student's previous college work as shown in transcripts, portfolio, statement of intent, résumé, and references. This program includes thirty-two hours of qualifying coursework (some course requirements may be waived upon review of transcripts and experience) prior to forty-nine semester hours of graduate work, including a master's thesis contributing to the knowledge base of interior design or a master's design studio.

### **Master of Interior Design (postprofessional)**

For students entering with a professional degree in interior design or architecture, the Master of Interior Design is a postprofessional degree. This program requires forty-eight semester hours of graduate work, including a master's thesis contributing to the knowledge base of interior design or a master's design studio.

## **Graduate Courses**

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### **Architectural Interior Design: ARI**

#### **ARI 281. Visual Communications.**

Introduction to using digital tools for communicating design, with an emphasis on integrating digital image, CAD, and 3-D software processes with hand drawing and modeling techniques. Subjects may include the manipulation of digital images, the combination of text and image, rendered perspectives, measured drawings, an introduction to 3-D modeling, and the use of advanced visual language. Some projects are based on work done in the student's design studios. Six hours of lecture and studio a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

#### **ARI 381R. Topics in Representation.**

Topics in the fundamental components of interior design and visual communication. Five or six laboratory hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

#### **ARI 381T. Topics in Emerging Technologies.**

Examines tools, techniques, and methods used in simulating, constructing, and experiencing interior space. Studies how various emerging technologies affect interior design, from initial design to fabrication to completion. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

**ARI 382. Interior Design Practice.**

Business procedures, professional practice, design project control and management, and professional ethics as they relate to interior design. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

**ARI 384K. Environmental Control I.**

Survey of acoustics, color, light, illumination, and electrical and information systems in architectural interiors. Includes techniques of documentation. Three lecture hours and one laboratory hour a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

**ARI 384L. Environmental Control II.**

Survey of heating, ventilation, air conditioning, vertical transportation, and plumbing systems in buildings. Includes techniques of documentation. Three lecture hours and one laboratory hour a week for one semester. Prerequisite: Graduate standing, Architectural Interior Design 384K with a grade of at least C, and consent of the graduate adviser.

**ARI 385K. Construction I.**

Restricted to students in the Master of Interior Design, first professional program. Introduction to building construction, materials, and structures. Three lecture hours and three laboratory hours a week for one semester. Prerequisite: Graduate standing and consent of graduate adviser.

**ARI 385L. Construction II: Interior Materials and Assemblies.**

Restricted to students in the Master of Interior Design, first professional program. Core concepts in interior materials, assemblies, and systems. Includes material properties, environmental and sustainable issues, attachment, detailing, and product specifications. Projects encourage manipulation and assembly of various material systems. Also includes case studies using material samples, and field trips to sites of fabrication. Six lecture hours and three laboratory hours a week for one semester. Prerequisite: Graduate standing, Architectural Interior Design 385K with a grade of at least C, and consent of graduate adviser.

**ARI 385T. Topics in Materials and Tectonics.**

Investigates traditional interior design materials and materials emerging from new technologies. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

**ARI 386K. Seminar in Interior Design.**

Introductory subjects in interior design. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

**ARI 386M. Topics in Interior Design Theory and Criticism.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

**ARI 388. Designing for Human Behavior.**

Restricted to students in the Master of Interior Design, first professional program. Three lecture hours a week for one semester. Architectural Interior Design 386M (Topic: Designing for Human Behavior) and 388 may not both be counted. Prerequisite: Graduate standing.

**ARI 388K. Interior Design History I.**

Survey of interior design from antiquity through the eighteenth century, including theoretical, social, technical, and environmental issues. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

**ARI 388L. Interior Design History II.**

Study of function and aesthetics, and decoration and use, emphasizing interiors from the nineteenth century to the present. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Architectural Interior Design 388K with a grade of at least C.

**ARI 388R. Topics in Interior Design History.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser. Additional prerequisites may vary with the topic.

**ARI 389, 689. Research in Interior Design.**

Investigation of problems selected by the student and approved by the graduate adviser. Three or six lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

**ARI 693. Master's Design Studio.**

Restricted to students in the Master of Interior Design, first professional program. Advanced study in architectural interior design, addressing complex design problems and issues related to various architectural topics. The equivalent of eighteen laboratory hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

**ARI 693K. Interior Design Core Studio I.**

Explores interior spaces and their sequence and adjacencies. Studies individual rooms, their locations, and their uses in such fields as hospitality, health care, and entertainment. Special emphasis on the design of transitions from public spaces to personal spaces. Fifteen hours of lecture and studio a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

**ARI 693L. Interior Design Core Studio II.**

Examination of the elements of interior space and scale, including specific human factors. Particular emphasis on the design, documentation, production, and placement of objects in interiors. Fifteen hours of lecture and studio a week for one semester. Prerequisite: Graduate standing, Architectural Interior Design 693K with a grade of at least C, and consent of the graduate adviser.

**ARI 694. Advanced Design: International Studio.**

Advanced problems in international interior design. Students help design new residential or commercial buildings, incorporating local architectural style. Includes research of local historical texts. Taught abroad in locations that vary by semester, but may include Italy and Mexico. Fifteen studio hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing, Architectural Interior Design 693K and 693L, and consent of the graduate adviser.

**ARI 695. Interior Design: Technical Studio.**

Comprehensive studio that focuses on combining the elements that create a thorough interior design. Fifteen studio hours a week for one semester. Prerequisite: Graduate standing, Architectural Interior Design 693K and 693L, and consent of the graduate adviser.

**ARI 696. Advanced Interior Design Studio.**

Studies advanced problems in interior design and examines design strategies and different phases of design. Topics may focus on interior design as it relates to retail, education, sustainability, and health care. Fifteen studio hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, Architectural Interior Design 693K and 693L, and consent of the graduate adviser.

### **ARI 197. Interior Design Internship.**

Practical application of design procedures in a professional design office. Sixteen to twenty hours of work a week for one semester (a total of at least 250 hours). Prerequisite: Graduate standing and consent of the graduate adviser.

### **ARI 698. Thesis.**

For students seeking the Master of Interior Design degree. The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in interior design and consent of the graduate adviser; for 698B, Interior Design 698A.

## **Landscape Architecture**

*Master of Landscape Architecture*

### **Areas of Study**

The Master of Landscape Architecture, first professional degree, is a professional degree program for students who do not have a background in landscape architecture or an LAAB-accredited degree in landscape architecture.

The Master of Landscape Architecture, postprofessional degree, is a postprofessional degree program for students who hold an LAAB-accredited degree in landscape architecture.

For more information, visit the landscape architecture Web site (<http://soa.utexas.edu/programs/landscape-architecture>).

### **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Dean J Almy	David D Heymann
Miroslava M Benes	Allan W Shearer
Richard L Cleary	Jason S Sowell
Gabriel Diaz Montemayor	Frederick R Steiner
Hope Hasbrouck	

### **Admission Requirements**

Upon admission to the program, the student must pay a nonrefundable enrollment deposit to indicate that he or she accepts the offer of admission. The deposit is applied to the payment of tuition when the student enrolls.

**Master of Landscape Architecture (first professional).** This degree program (<http://soa.utexas.edu/apply/graduate-admissions/application-instructions/master-landscape-architecture-first-professional>) is open to qualified applicants who hold baccalaureate degrees in any discipline. Applicants with an accredited professional degree in architecture may be eligible for admission with advanced standing. Applicants with a nonaccredited preprofessional degree in architecture, landscape architecture, or environmental design may also be granted advanced standing. Prerequisites include at least one three-semester-hour course in basic ecology or the equivalent.

Those who qualify are generally granted advanced standing of up to one or two terms, subject to review by the admissions committee. Students may be able to waive degree requirements by a petition process and by demonstrating equivalent study in any of the required course areas.

**Master of Landscape Architecture (postprofessional).** This degree program ([http://soa.utexas.edu/apply/graduate-admissions/application-](http://soa.utexas.edu/apply/graduate-admissions/application-instructions/master-landscape-architecture-post-professional)

[instructions/master-landscape-architecture-post-professional](http://soa.utexas.edu/apply/graduate-admissions/application-instructions/master-landscape-architecture-post-professional)) is open to qualified applicants who hold accredited professional degrees in landscape architecture.

## **Degree Requirements**

### **Master of Landscape Architecture (first professional)**

This accelerated graduate program (<http://soa.utexas.edu/programs/landscape-architecture/landscape-architecture-degree-programs/masters-landscape-architecture-i>) is designed to prepare students for advanced work in landscape architecture. Upon admission, students must complete a structured core sequence of courses in design, visual communication, natural systems, history and theory, and technology in landscape architecture. Upon completion of the core sequence, students are qualified to begin advanced study in the discipline. Students in the first professional degree program must be enrolled full time and must complete at least eighty-seven semester hours of coursework. Students granted advanced standing normally complete their studies in two or more years, with sixty or more semester hours of coursework. The number of hours will vary according to the program of study outlined by the faculty upon admission.

### **Master of Landscape Architecture (postprofessional)**

This graduate program (<http://soa.utexas.edu/programs/landscape-architecture/landscape-architecture-degree-programs/masters-landscape-architecture-ii>) is designed to provide individuals who have completed an accredited undergraduate professional landscape architecture degree or its equivalent an opportunity to engage in advanced scholarship and professional development. Students in the postprofessional degree program normally complete their studies in two years, with a total of forty-eight semester hours of coursework.

Enrolled students who seek to obtain course credit toward the Master of Landscape Architecture from other educational institutions must petition for approval for credit substitution from the Graduate Studies Committee in landscape architecture both prior to, and upon completion of, that coursework. Such approval will usually only be granted in hardship situations and upon evidence that completed coursework is commensurate with the same at the University.

## **Graduate Courses**

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### **Landscape Architecture: LAR**

#### **LAR 380. Summer Atelier in Landscape Architecture.**

An introduction to the fundamental components of landscape architecture and graphic communication. Students are introduced to basic drawing and representational skills. Three lecture hours a week for one semester. Prerequisite: Graduate standing, admission to the Master of Landscape Architecture program, and consent of the graduate adviser.

### **LAR 381R. Topics in Visual Communication.**

Advanced topics in media and interpretation, such as freehand drawing, measured drawings, aspects of computer graphics, geographic information systems, and photography. Six laboratory hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **LAR 682. Design and Visual Studies in Landscape Architecture I.**

First core design studio that introduces students to the practice of landscape architectural design, representation, and theoretical practices. Fifteen laboratory hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing, Landscape Architecture 380, credit or registration for Landscape Architecture 385K and 388K, and consent of the graduate adviser.

### **LAR 682T. Design and Visual Studies in Landscape Architecture II.**

Second core design studio that examines the issues, methods, and theories studied in Landscape Architecture 682 with increasing levels of complexity. Fifteen laboratory hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing, Landscape Architecture 682 with a grade of at least C, credit or registration for Landscape Architecture 385L and 388L, and consent of the graduate adviser.

### **LAR 384. Topics in Horticulture and Plants in Design.**

Study of habitat, site and technical conditions, and characteristics of plant typologies and their application to landscape practice. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **LAR 385. Topics in Natural Systems.**

Elective seminars in aspects of environmental analysis, ecological and systemic approaches, sustainable development, and applied methods of geographic information systems. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **LAR 385K. Technology Workshop I.**

Introduces the principles, processes, and practices of site manipulation, description, and construction techniques. Includes systems of measurement, grading, earthwork, site circulation, and site drainage, and examines the representation, application, and integration of site-related operations. Two lecture hours and three laboratory hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### **LAR 385L. Technology Workshop II.**

Materials and methods of landscape construction, advanced site work techniques, and theories for material selection and application within the design process. Examines the representation, application, and integration of detail and design intent. Two lecture hours and three laboratory hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing, Landscape Architecture 385K with a grade of at least C, and consent of the graduate adviser.

### **LAR 385M. Design Methods.**

Examines methods of analysis and composition for landscape architecture and urban design. Readings, lectures, and discussions are applied to on-site assignments. Subjects include spatial, social, and ecological factors and their interactions. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing; Landscape Architecture 385L with a grade of at least C; credit or

registration for Landscape Architecture 694T; or consent of the graduate adviser.

### **LAR 385N. Native Plants.**

Plant identification and principles of ecology using Central Texas habitats and plants as examples, including how soil, climate, and management affect plant success. Three lecture hours a week for one semester. Landscape Architecture 384 (Topic: Native Plants) and 385N may not both be counted. Prerequisite: Graduate standing, and admission to the Master of Landscape Architecture program or consent of the graduate adviser.

### **LAR 386. Professional Practice.**

Ethical, legal, economic, and administrative processes and responsibilities of the landscape architect practitioner. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### **LAR 387. Landscape Ecology.**

Introduction to foundational concepts in landscape ecology, with emphasis on structure, function, and change of ecological systems. Addresses design and planning in relation to biological and cultural resources. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### **LAR 388. Topics in Landscape Architecture History and Theory.**

Seminars on advanced topics in history and theory, including analysis, readings, and critique of significant positions, practice, and discourse. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and Landscape Architecture 388L or consent of the graduate adviser.

### **LAR 388K. History and Theories of Landscape Architecture I.**

Landscape architecture in formal, social, and cultural terms in the Western and Eastern worlds. Covers the development of ideas and principles related to context, designer, and text. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### **LAR 388L. History and Theories of Landscape Architecture II.**

Landscape architecture from 1700 to the present, with a focus on design language, theoretical frameworks, and the critical components of contemporary landscape design and thought. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Landscape Architecture 388K with a grade of at least C, and consent of the graduate adviser.

### **LAR 388M. Postprofessional Seminar in Landscape Architecture.**

Examines fundamental aspects about the design of the built environment, design-related research, and design practices. Explores representation, process, evaluation, change, impact, and synthesis for design decision making based upon cultural values. Three lecture hours a week for one semester. Prerequisite: Graduate standing; admission to the Master of Landscape Architecture (first professional) degree program with advanced standing, or admission to the Master of Landscape Architecture (postprofessional) degree program; and consent of the graduate adviser.

### **LAR 389, 689. Research in Landscape Architecture.**

Investigation of topics in landscape architecture selected by the student with approval of the Graduate Studies Committee. Independent study. Prerequisite: Graduate standing and consent of the graduate adviser.



### **LAR 694T. Landscape Architectural Design.**

Third core design studio that engages issues, theories, and methods central to the planning and design of large projects. Emphasis is given to the resolution of multiple interrelated objectives. Fifteen laboratory hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing, Landscape Architecture 682T with a grade of at least C, credit or registration for Landscape Architecture 385M and 385N, and consent of the graduate adviser.

### **LAR 695. Comprehensive Landscape Studio.**

Fourth core design studio that engages theory and practice, and provides students with an opportunity to consider a landscape project from initial research and site investigation to detailed design, implementation, and technical resolution. Fifteen laboratory hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing, Landscape Architecture 694T with a grade of at least C, and consent of the graduate adviser.

### **LAR 696. Advanced Design.**

Elective studios offering students an opportunity to explore particular topics in landscape, often in collaboration with architecture and community and regional planning students. Fifteen laboratory hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, Landscape Architecture 695 with a grade of at least C, and consent of the graduate adviser.

### **LAR 397. Master's Design Study in Landscape Architecture--Preparation.**

Investigation of topics in landscape architecture selected by the student in preparation for Landscape Architecture 697K. The equivalent of three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### **LAR 697K. Master's Design Study in Landscape Architecture.**

An independent design project in which the investigation, design process, and critical evaluation are formulated by the student. The project must have a theoretical and research base, provide a comprehensive exploration of a landscape design topic, and offer insight for the furthering of landscape studies. Eighteen laboratory hours a week for one semester. Prerequisite: Graduate standing, Landscape Architecture 696 and 397, and consent of the graduate adviser.

### **LAR 197L. Landscape Architecture Practicum.**

Restricted to students enrolled in the Master of Landscape Architecture First Professional Degree or Master of Landscape Architecture Post-Professional Degree programs. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

## **Red McCombs School of Business**

## **Business Administration**

*Master of Business Administration*

### **For More Information**

**Campus address:** College of Business Administration Building (CBA) 2.502, phone (512) 471-7698, fax (512) 471-4131; campus mail code: B6004

**Mailing address:** The University of Texas at Austin, Red McCombs School of Business, MBA Program Office,

1 University Station B6004, Austin TX 78712-0205

**E-mail:** [texasmba@mcombs.utexas.edu](mailto:texasmba@mcombs.utexas.edu)

**URL:** [www.mcombs.utexas.edu](http://www.mcombs.utexas.edu)

## **Facilities for Graduate Work**

Facilities for graduate study in business include state-of-the-art classrooms and seminar rooms, which are equipped with multimedia and computer terminal facilities. Computer classrooms, computer laboratories, a Financial Trading and Technology Center, and a behavioral science laboratory are also available. A variety of special collections and databases are available for research and study. In addition, there are extensive study and research facilities for individual and group projects.

Library holdings in business, economics, and related areas are unusually comprehensive; the University has several noteworthy collections, such as those on Latin America and Texas, that are of special interest to business students. Also available are personalized reference services, including library instruction classes, Web-based subject and course guides, and an extensive array of online business and statistical databases; a tax collection; and a large selection of materials to aid in productive problem solving. These holdings are located in the Perry-Castañeda Library and are available through the University Libraries Web site (<http://www.lib.utexas.edu>).

Other facilities of interest, especially to students of international business, include the Center for International Business Education and Research, the Benson Latin American Collection, the Teresa Lozano Long Institute of Latin American Studies, the Center for Middle Eastern Studies, the Center for East Asian Studies, the South Asia Institute, and the Population Research Center. Additional opportunities for research are provided by the AIM Investment Center; the Center for Business, Technology, and Law; the Center for Customer Insight and Marketing Solutions; the Real Estate Finance and Investment Center; the Center for Research in Electronic Commerce; the EDS Financial Trading and Technology Center; the Hicks, Muse, Tate & Furst Center for Private Equity Finance; the Herb Kelleher Center for Entrepreneurship; the IC2 Institute; the Supply Chain Management Center of Excellence; the Center for Energy Finance Education and Research; the Center for Risk Management and Insurance; the Energy Management and Innovation Center; and the Jon Brumley Texas Venture Labs.

The McCombs School of Business has its own computer network that links the school's laboratories and other computing resources. The network is also connected to the University's computing infrastructure. All Master of Business Administration (MBA) students are required to own a laptop computer.

The MBA Program Office provides information, academic advising, and student services to MBA students; contact information is given on the top of this page.

## **Areas of Study**

Graduate study is offered in the following areas: accounting; business, government, and society; finance; information, risk, and operations management; management; marketing; and technology commercialization. Students in the full-time program may concentrate their coursework in one of these areas.

## **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Ashish Agarwal  
John R Allison  
Andres Almazan  
Aydogan Alti  
Emily Amanatullah  
Edward G Anderson Jr  
Fernando Antonio Nunes Dionisio Anjos  
Rowland Atiase  
Uttarayan Bagchi  
Anantaram Balakrishnan  
Caroline A Bartel  
Anitesh Barua  
Y Sekou Bermiss  
Patrick L Brockett  
Susan M Broniarczyk  
Keith C Brown  
Ethan R Burris  
Johnny S Butler  
Carlos Marinho Carvalho  
Judson Caskey  
Deepayan Chakrabarti  
Naveed Chehrazi  
Shuping Chen  
Michael B Clement  
Jonathan B Cohn  
Eli P Cox III  
Frank B Cross  
William H Cunningham  
John A Daly  
Paul Damien  
James W Deitrick  
Jade S Dekinder  
Andres Francisco Donangelo  
Dain Donelson  
Jun A Duan  
Janet M Dukerich  
James S Dyer  
Douglas Stephen Fearing  
Cesare Fracassi  
James W Fredrickson  
Robert N Freeman  
Rajiv Garg  
George W Gau  
Kishore Gawande  
Andrew D Gershoff  
Stephen M Gilbert  
Kate Gillespie  
Thomas W Gilligan  
Linda L Golden  
Melissa E Graebner  
Michael H Granof  
Betsy S Greenberg  
John M Griffin  
Genaro J Gutierrez  
Beverly L Hadaway  
David A Harrison  
Jay C Hartzell  
John William Hatfield  
Andrew D Henderson  
Ty Henderson  
D E Hirst  
Wayne D Hoyer  
Julie R Irwin  
Sirikka L Jarvenpaa

Travis Lake Johnson  
Steven J Kachelmeier  
Matthias Kahl  
William R Kinney Jr  
Prabhudev C Konana  
Lisa L Koonce  
Samuel Arthur Kruger  
Guoming Lai  
Tim Landvoigt  
Volker Laux  
Stephen T Limberg  
James Richard Lowery Jr  
Stephen P Magee  
Vijay Mahajan  
Luis D Martins  
Leigh M McAlister  
Reuben R McDaniel Jr  
John M McInnis  
Rafael Mendoza-Arriaga  
Lillian F Mills  
Douglas J Morrice  
John R Mote  
Paula C Murray  
Kumar Muthuraman  
Donald P Newman  
Robert Parrino  
Shefali V Patil  
Robert A Peterson  
Francisco Polidoro Jr  
Robert A Prentice  
Rajagopal Raghunathan  
Ramkumar Ranganathan  
Raghunath S Rao  
Ramesh K Rao  
Brian Richter  
Violina P Rindova  
John R Robinson  
Ehud I Ronn  
Maytal Saar-Tsechansky  
Thomas W Sager  
Jaime Joy Schmidt  
Jan Schneider  
Jeri Kristina Seidman  
Thomas S Shively  
Clemens Sialm  
Garrett P Sonnier  
Lewis J Spellman  
David B Spence  
Rajashri Srinivasan  
Laura T Starks  
Huseyin Tanriverdi  
Frenkel Ter Hofstede  
Sheridan Titman  
Efsthios Tompaidis  
Wen Wen  
Timothy Daniel Werner  
Andrew B Whinston  
Brian White  
Jennifer Whitson  
Michael G Williamson  
Sinead Williamson  
Yong Yu  
Thaleia Zariphopoulou  
Xiaolan Zhang  
Mingyuan Zhou

Ross G Jennings

## Admission Requirements

Several scheduling options are available to students seeking the MBA: full-time, executive, and evening programs in Austin; weekend programs in Dallas and Houston; and a weekend executive program in Mexico City at the Tecnológico de Monterrey–Campus Santa Fe.

Admission decisions for all programs are based on the applicant's test scores, academic and professional background, letters of recommendation, and other factors.

With the following exceptions, all applicants must submit a valid score from the Graduate Management Admission Test (GMAT) or the Graduate Records Examination General Exam (GRE).

Applicants to the Mexico City program may, at their option, submit scores on the Tecnológico de Monterrey Prueba de Admisión a Estudios de Posgrado (PAEP).

The admissions committee may consider waiving the GMAT/GRE requirement in the executive MBA programs in Austin and Mexico City when one of the following conditions is met: (1) fifteen years of postgraduate work experience, (2) five years of people/project management experience, (3) an advanced degree, (4) an expired GMAT or GRE.

TOEFL or IELTS scores are required of all applicants who are not United States citizens or permanent residents, and for those who received their undergraduate education in a country where English is not the official language.

Upon admission to the program, the student must pay a nonrefundable enrollment deposit to indicate that he or she accepts the offer of admission. The deposit is applied to the payment of tuition when the student enrolls. The deposit is also required of students admitted to the dual degree (p. 43) programs.

More information about the admission process for each program is published by the McCombs School online (<http://www.mcombs.utexas.edu/MBA>).

## Degree Requirements

The objective of each of the programs described below is to develop influential business leaders who are able to assume high-level responsibilities in the rapidly changing national and international environment of the public and private sectors. The curriculum is designed to stimulate intellectual curiosity; to develop analytical and research ability; and to give students the ability to make sound managerial decisions, to plan, organize, and control activities in order to achieve established goals, and to manage people, organizations, and change. Students are expected to acquire the concepts, tools, and understanding to operate in and contribute successfully to new economic environments. Such environments are characterized by rapid technological change, global competition, and information-rich or information-deficient management decisions. Each program is designed to accommodate students with baccalaureate degrees in a wide variety of fields. Each affords the student a wide range of choices to complete a course of advanced study that integrates developments, theory, and applications involved in the exercise of executive and managerial administrative responsibilities.

## Full-Time Program

The full-time Master of Business Administration (MBA) is a two-year program taught in Austin. Students enter the program in the fall and

graduate at the end of the second spring semester. At least fifteen hours of coursework are required each semester. A one-hour career management course is required in the first semester.

The program requires sixty to sixty-two semester hours of coursework. Twenty-three hours are provided by required core courses. Students are required to take certain core courses in an assigned cohort.

During the first semester of the program, students are organized into cohorts of about sixty members. The students in each cohort take most core courses together. Within the cohort and in particular courses, students may be assigned to four- or five-person study groups to encourage group problem solving and teamwork and the development of leadership skills.

At least thirty-seven semester hours of approved graduate electives are required. The student may concentrate the elective coursework within a discipline, such as marketing; each concentration consists of a sequence of courses that offers strong preparation for a particular career path. Students are not required to choose a concentration.

Further information about prerequisites, requirements, and concentrations is available from the MBA Program Office, online (<http://www.mcombs.utexas.edu/MBA/Full-Time.aspx>) and by e-mail.

## Weekend and Evening Programs in Austin

A carefully planned program of continuing education and development for executives is essential in today's dynamic business environment. The following programs provide this graduate business education for early-career to senior managers while permitting them to continue their careers.

**Executive MBA.** The executive MBA program is a twenty-one month program designed to meet the needs of academically qualified midcareer professionals who wish to pursue an MBA degree while continuing to carry the full responsibilities of their jobs. Classes are held on alternate Fridays and Saturdays. This rigorous and demanding program requires a serious commitment from both the student and the student's employer. All students must complete thirty-six semester hours of required coursework and six hours of electives.

Prospective students should have at least five years of experience in management. The average work experience of currently enrolled students exceeds twelve years. A brochure describing the program is available from the MBA Program Office. Information is also available online (<http://www.mcombs.utexas.edu/MBA/Executive-EMBA.aspx>) and by e-mail.

**Evening MBA.** This two and one-half year graduate business program is designed for working professionals who choose to work while pursuing the MBA. Classes are held on Monday and Tuesday evenings, from 6:00 pm - 9:15 pm. Occasional weekend classes are scheduled in order to meet minimum contact hour requirements. Students attend classes in the fall, spring, and summer, and must complete forty-eight semester hours of coursework. The evening MBA program is designed to help high-potential managers become global business leaders.

Prospective students should have at least two years of work or professional experience. The average work experience of currently enrolled students is nearly six years. A brochure describing the program is available from the MBA Program Office. Information is also available online (<http://new.mcombs.utexas.edu/mba/temba.aspx>).

## Weekend Programs Outside Austin

**MBA at Houston and MBA at Dallas-Fort Worth.** These rigorous, two-year graduate business programs are designed for managers and professionals who wish to pursue an MBA degree outside normal working hours. Classes are held Friday evenings from 4:00 pm to 8:00 pm and

Saturdays from 8:00 am to 5:00 pm on alternate weekends. Occasional three-day (Friday through Sunday) class weekends will be scheduled in order to meet minimum contact hour requirements. Classes held in Dallas meet at the University of Texas Southwestern Medical Center at Dallas. Classes held in Houston meet at the University of Texas Health Science Center at Houston. Students must complete forty-eight semester hours of coursework. In addition, the programs include two one-week intensive seminars in Austin and a week-long international trip.

The high academic standards and dedicated faculty are the same as in the full-time MBA program. Information about the Houston program (<http://www.mcombs.utexas.edu/mba/houston.aspx>) and the Dallas-Fort Worth program (<http://www.mcombs.utexas.edu/mba/dallas.aspx>) are available online.

**Executive MBA at Mexico City.** This two-year program for executives is taught by McCombs School and Tecnológico de Monterrey faculty members at the EGADE Business School—Campus Santa Fe. Students who complete the forty-two semester hours of coursework earn both the MBA degree from the University of Texas at Austin and a Master of Administration degree from Tecnológico de Monterrey. Classes meet Friday evenings and all day Saturday, usually on alternate weekends. In addition, students take part in three one-week intensive seminars, two in Austin and one at an international location. Information about the program is available online (<http://www.mcombs.utexas.edu/MBA/MBA-Mexico>).

## Dual Degree Programs

The McCombs School of Business offers the following dual degree programs in cooperation with other divisions of the University. More information is available from the graduate adviser in each program.

Field(s) of Study	Degree(s)
Advertising	Master of Arts
Asian studies	Master of Arts
Communication studies	Master of Arts
Global policy studies	Master of Global Policy Studies
Journalism	Master of Arts
Latin American studies	Master of Arts
Law	Doctor of Jurisprudence
Mechanical engineering, with a concentration in manufacturing and decision systems engineering	Master of Science in Engineering
Middle Eastern studies	Master of Arts
Nursing, with a concentration in nursing systems	Master of Science in Nursing
Public affairs	Master of Public Affairs
Radio-television-film	Master of Arts
Russian, East European, and Eurasian studies	Master of Arts
Energy and Earth Resources	Master of Science or Master of Arts

## Double Degree Programs

Students interested in a Master of Business Administration degree with an international focus may seek admission to the Double Degree Program. This program allows students in the full-time MBA program to take a substantial part of their coursework at a partner school outside the United States. The student must complete at least thirty-seven semester hours of graduate coursework in residence at the McCombs School and must also fulfill the partner school's requirements for coursework in residence. Students who complete the program earn both the MBA from the University and the equivalent degree from the partner school.

Applicants must be proficient in English and must meet the language requirements of the partner school. The McCombs School offers this program in cooperation with the Chinese University of Hong Kong; Escuela de Administración de Negocios para Graduados, Lima, Peru; Fundação Getúlio Vargas, São Paulo, Brazil; Guanghua School of Management, Beijing, China; Pontificia Universidad Católica de Chile, Santiago; WHU—Koblenz Otto Beisheim School of Management, Vallendar, Germany; and various campuses of the Instituto Tecnológico y de Estudios Superiores de Monterrey, Mexico. Additional partner schools may be added in the future. Further information on the Double Degree Program is published online (<http://www.mcombs.utexas.edu/MBA/Full-Time/Hands-On/International/Double-Degree.aspx>).

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Business Administration: B A

#### **B A 180C, 280C, 380C. Information Technology Management.**

Restricted to students in the MBA program. A discussion of technical architecture, including hardware/software platforms, operating systems, networking and the Internet; development strategies; and management issues for the introduction of new technology. For each semester hour of credit earned, one lecture hour a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the McCombs School of Business.

#### **B A 380F. Accounting Information for Managerial Decision Making.**

Restricted to second-year students in the MBA program. Financial information regarding revenue, cost, and assets, with an emphasis on the interpretation of numbers to derive well-informed management decisions. Covers the role of taxes in business strategy. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **B A 380M. Management Science.**

Introduction to the structure and use of mathematical models and methods for analyzing managerial decision problems. Development and application of modeling concepts and skills underlying the analytical techniques used to solve such problems. Introduction to a range of computers, and use of the latest in computer-based decision support systems. Three lecture hours a week for one semester. Prerequisite: Admission to the McCombs School of Business.

#### **B A 180N, 280N, 380N. Operations Management.**

An introduction to the issues and decisions involved in the production of goods and services. Focuses on designing, operating, controlling, and improving the systems that accomplish production. For 180N, one lecture hour a week for one semester; for 280N, four lecture hours a week for half a semester; for 380N, three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the McCombs School of Business.

#### **B A 180S, 280S, 380S. Managerial Economics.**

Microeconomic and macroeconomic forces that influence an organization's decisions: interest rates, business cycles, financial systems, input demand and supply, industry factors, market structure, and externalities. For each semester hour of credit earned, one lecture

hour a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the McCombs School of Business.

#### **B A 181C. Strategic Career Planning.**

Restricted to first-year students in the MBA program. Issues surrounding career planning, including exploration and implementation. Professional development issues, including self-assessment. One and one-half lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### **B A 181T, 281T, 381T. Marketing Management.**

An introduction to the marketing perspective on strategy development and to the elements of marketing analysis. Includes the functional decision areas of the marketing manager, such as products and product lines, pricing policies, branding, promotion and advertising, and channels of distribution, and how organizations use these components to create, capture, and sustain value for the firm. For 181T, one lecture hour a week for one semester; for 281T, four lecture hours a week for half a semester; for 381T, three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the McCombs School of Business.

#### **B A 182T, 282T, 382T. Managerial Accounting.**

An investigation of the conceptual and operational relationship of planning and control with management and accounting information systems. Topics include data collection and analysis for short-range and long-range organizational decisions. For each semester hour of credit earned, one lecture hour a week for one semester. Only one of the following may be counted: Accounting 329, 359, 287 (Topic 1), 287 (Topic 5), 387 (Topic 1), 387 (Topic 5) Business Administration 182T, 282T, 382T. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the McCombs School of Business.

#### **B A 184S, 284S, 384S. Economics for Business.**

Restricted to students in the McCombs School of Business. Microeconomic and macroeconomic forces that influence an organization's decisions, such as interest rates, business cycles, financial systems, input demand and supply, industry factors, market structure, and externalities. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

**Topic 1: Managerial Microeconomics.** Microeconomic forces that influence an organization's decisions, including input supply and demand, industry factors, market structure, and externalities. For each semester hour of credit earned, one lecture hour a week for one semester. Offered on the letter-grade basis only.

**Topic 2: Managerial Macroeconomics.** Macroeconomic forces that influence an organization's decisions, including interest rates, business cycles, and financial systems. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Offered on the letter-grade basis only.

#### **B A 184T, 284T, 384T. Financial Accounting.**

An examination of the information needs of capital market participants in a dynamic and complex socioeconomic system; emphasis on interpretation, measurement, and disclosure of economic events. For 184T, one lecture hour a week for one semester; for 284T, four lecture hours a week for half a semester; for 384T, three lecture hours a week for one semester. Accounting 381 and Business Administration 184T, 284T, 384T may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the McCombs School of Business.

**B A 185T, 285T, 385T. Financial Management.**

An exploration of concepts and techniques employed in investment decision making, working capital management, and financing the activities of a business. For 185T, one lecture hour a week for one semester; for 285T, four lecture hours a week for half a semester; for 385T, three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the McCombs School of Business.

**B A 186T, 286T, 386T. Statistics.**

A unified approach to basic concepts in collection, analysis, and interpretation of data, emphasizing capabilities of different statistical methods and business applications. Students use statistical software packages. For 186T, one lecture hour a week for one semester; for 286T, four lecture hours a week for half a semester; for 386T, three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the McCombs School of Business.

**B A 287T. Legal and Regulatory Environment of Business.**

Examination of relationships between public and private institutions, with emphasis on the legal constraints on managerial decision making. Two lecture hours a week for one semester. Prerequisite: Admission to the McCombs School of Business.

**B A 188T, 288T, 388T. Strategic Management.**

Designed to help students develop a general management orientation. Subjects include the role of the general manager, formulating business and corporate-level strategy, managing strategic change, strategy implementation, and developing general managers. For each semester hour of credit earned, one lecture hour a week for one semester. Business Administration 188T, 288T, 388T and Management 385 (Topic 49: Strategic Management) may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the McCombs School of Business.

**B A 389T. Managing People and Organizations.**

Development of the general areas of theory most central to dealing with the varieties of social/psychological behavior of direct import to the administrator and manager. Three lecture hours a week for one semester. Prerequisite: Admission to the McCombs School of Business.

**B A 390C. Hardware, Software, and Telecommunications.**

Provides a broad familiarity with the latest advances in the fundamental concepts and terminology of computer architecture and software. Three lecture hours a week for one semester. Prerequisite: Admission to the McCombs School of Business and to the concentration in information systems management.

**B A 190D, 290D, 390D. Management Information Systems.**

The use of decision support systems and database management concepts in an organization for information management and processing by mainframe and personal computer. For each semester hour of credit earned, one lecture hour a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the McCombs School of Business.

**B A 390F. Information Systems Design and Implementation.**

Specification, design, implementation, and testing of information systems. Three lecture hours a week for one semester. Prerequisite: Admission to the McCombs School of Business.

**B A 390H. Managing Information.**

Management and use of information in organizations, including database management, analytical approaches for effective information

management, and organizational issues. Three lecture hours a week for one semester. Prerequisite: Graduate standing and admission to the McCombs School of Business.

**B A 390J. Data Communications, Networks, and Distributed Processing.**

Functional aspects of data communications, computer networks, and distributed information systems, using campus computers and the network systems available in the classroom. Three lecture hours a week for one semester. Prerequisite: Admission to the McCombs School of Business.

**B A 191, 291, 391, 691. Special Studies in Business Administration.**

Conference course. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Finance.**

**Topic 2: Management.**

**Topic 3: Real Estate.**

**Topic 4: Risk Management.**

**Topic 5: Accounting.**

**Topic 6: Marketing.**

**Topic 8: Business, Government, and Society.**

**B A 192C, 292C, 392C, 692C. Special Studies in Business, Government, and Society.**

Restricted to McCombs graduate students. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Conference course. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

**B A 192D, 292D, 392D, 692D. Special Studies in Business, Government, and Society.**

Restricted to McCombs graduate students. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Conference course. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**B A 192E, 292E, 392E, 692E. Special Studies in Finance.**

Restricted to McCombs graduate students. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Conference course. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

**B A 192F, 292F, 392F, 692F. Special Studies in Finance.**

Restricted to McCombs graduate students. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Conference course. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**B A 192G, 292G, 392G, 692G. Special Studies in International Business.**

Restricted to McCombs graduate students. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Conference course. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

**B A 192H, 292H, 392H, 692H. Special Studies in International Business.**

Restricted to McCombs graduate students. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Conference course. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**B A 192J, 292J, 392J, 692J. Special Studies in Legal Environment of Business.**

Restricted to McCombs graduate students. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Conference course. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

**B A 192K, 292K, 392K, 692K. Special Studies in Legal Environment of Business.**

Restricted to McCombs graduate students. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Conference course. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**B A 192L, 292L, 392L, 692L. Special Studies in Management.**

Restricted to McCombs graduate students. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Conference course. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

**B A 192M, 292M, 392M, 692M. Special Studies in Management.**

Restricted to McCombs graduate students. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Conference course. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**B A 192N, 292N, 392N, 692N. Special Studies in Management Information Systems.**

Restricted to McCombs graduate students. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Conference course. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

**B A 192P, 292P, 392P, 692P. Special Studies in Management Information Systems.**

Restricted to McCombs graduate students. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Conference course. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**B A 192Q, 292Q, 392Q, 692Q. Special Studies in Marketing.**

Restricted to McCombs graduate students. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Conference course. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

**B A 192R, 292R, 392R, 692R. Special Studies in Marketing.**

Restricted to McCombs graduate students. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester.

Conference course. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**B A 192S, 292S, 392S, 692S. Special Studies in Operations.**

Restricted to McCombs graduate students. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Conference course. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

**B A 192T, 292T, 392T, 692T. Special Studies in Operations.**

Restricted to McCombs graduate students. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Conference course. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**B A 192U, 292U, 392U, 692U. Special Studies in Risk Management.**

Restricted to McCombs graduate students. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Conference course. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

**B A 192V, 292V, 392V, 692V. Special Studies in Risk Management.**

Restricted to McCombs graduate students. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Conference course. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**B A 398L. Written and Oral Communication for International Students.**

Designed to provide students at the high-intermediate level of English proficiency with communication skills beyond pronunciation and grammatical accuracy. Three lecture hours a week for one semester. Prerequisite: Graduate standing, admission to a doctoral program in the McCombs School of Business, and consent of instructor.

**B A 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in business administration, completion of the core courses for the degree, and consent of the supervising professor and the graduate adviser.

**B A 398T. Supervised Teaching in Business Administration.**

Teaching in the McCombs School of Business for two semesters under the close direction of the course instructor or supervisor; weekly group meetings with the instructor, individual consultations, and reports throughout the teaching period. Three lecture hours a week for one semester. Prerequisite: Graduate standing, approval of the department chair and the dean, and appointment as a teaching assistant.

## Accounting

*Master in Professional Accounting  
Master of Science in Accounting  
Doctor of Philosophy*

## For More Information

### MPA Program

**Campus address:** Graduate School of Business Building (GSB) 4.112C, phone (512) 471-6559, fax (512) 471-3365; campus mail code: B6400

**Mailing address:** The University of Texas at Austin, MPA Program, Department of Accounting, 2110 Speedway B6400, Austin TX 78712

**E-mail:** mpa@mcombs.utexas.edu

**URL:** <http://www.mcombs.utexas.edu/mpa/>

### MSACC and PhD Programs

**Campus address:** College of Business Administration Building (CBA) 4M.202, phone (512) 471-0157, fax (512) 471-3904; campus mail code: B6400

**Mailing address:** The University of Texas at Austin, PhD Program, Department of Accounting, 2110 Speedway, B6400, Austin TX 78712

**E-mail:** accounting.phd@mcombs.utexas.edu

**URL:** <http://www.mcombs.utexas.edu/departments/accounting/degree-programs/doctoral>

### Facilities for Graduate Work

The physical facilities, computing systems, and research centers that support graduate work in the McCombs School are described in the Business Administration section under Facilities for Graduate Work (p. 41).

### Areas of Study

The objective of this program is to provide the student with a sound foundation in the body of knowledge of business administration, broad exposure to the discipline of accounting, and the greater depth in accounting required to specialize and to enter the profession with the prospect of rapid career progress, high-level responsibility, and future leadership. The program is designed to provide outstanding students with the educational foundation for successful careers in public accounting, industry, consulting, not-for-profit organizations, and educational and financial institutions.

The faculty has designed three concentrations within the Master in Professional Accounting (MPA) program: financial reporting and assurance, managerial accounting and control, and taxation. Each concentration is a sequence of courses that offers strong preparation for a particular career path. In addition, the student may choose a generalist curriculum.

### Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Rowland Atiase  
Shuping Chen  
Michael B Clement  
James W Deitrick  
Dain Donelson  
Robert N Freeman  
Michael H Granof  
D E Hirst  
Ross G Jennings  
Steven J Kachelmeier  
William R Kinney Jr  
Lisa L Koonce

Volker Laux  
Stephen T Limberg  
John M McInnis  
Lillian F Mills  
Donald P Newman  
John R Robinson  
Jaime Joy Schmidt  
Jeri Kristina Seidman  
Brian White  
Michael G Williamson  
Yong Yu

## Admission Requirements

### Master in Professional Accounting

Applications to the Master in Professional Accounting (MPA) program are accepted for the fall semester only.

The Admissions Committee considers each completed application, giving particular attention to the statement of purpose, prior academic performance, letters of recommendation, extracurricular and community activities, honors and achievements, test scores, and work history (if applicable). Personal characteristics that add to the diversity of the class may also be considered, such as country of citizenship, family background, gender, multilingual skills, and socioeconomic history.

The MPA program is sufficiently flexible to accommodate students with bachelor's degrees in any field of study. However, students without a sufficient background in financial accounting may be required to complete undergraduate coursework before they begin the MPA curriculum.

Upon admission to the program, the student must pay a nonrefundable enrollment deposit to indicate that he or she accepts the offer of admission. The deposit is applied to the payment of tuition when the student enrolls. All fees and deposits are subject to change with appropriate approval. Students should consult *General Information* for the current amount of the enrollment deposit.

### Doctor of Philosophy

Admission to the PhD program is based on a holistic review by the PhD Admissions Committee of several factors, including the applicant's motivations for doctoral study, academic and work experience, and academic credentials. The number of applicants admitted is limited by the faculty's commitment to provide financial assistance, excellent teaching, and expert guidance to each student.

## Degree Requirements

### Master in Professional Accounting

The core of the Master in Professional Accounting (MPA) curriculum consists of twenty-five semester hours of coursework. Four of the core courses may be waived if the student has completed equivalent undergraduate work. In addition to the core, students complete eighteen hours in more specialized courses. They may choose one of the three tracks designed by the faculty—financial reporting and assurance, managerial accounting and control, and taxation—or they may choose courses to meet their specific academic and professional goals in the generalist curriculum.

Depending on their undergraduate backgrounds, students must earn from thirty to forty-three semester hours of credit to complete the program; all MPA students must complete at least nineteen semester hours in accounting. Students must complete at least two long-session semesters

in residence in the MPA program. In order to graduate, the student's overall, MPA, and accounting grade point averages must each be at least 3.00.

## Master of Science in Accounting

The Master of Science in Accounting is offered only to students who are enrolled in the doctoral program in accounting. This degree is offered in three options: with thesis, with report, and without thesis or report. The thesis option requires at least thirty semester hours of credit; the report option, at least thirty-three hours; and the option without thesis or report, at least thirty-six hours. All coursework must be logically related, and the student's entire program must be approved by the student's primary adviser and the graduate adviser. The Graduate Studies Committee's approval is not required.

## Doctor of Philosophy

The coursework for the doctoral degree includes four nonaccounting core courses, five accounting seminars, and coursework in two supporting fields outside accounting. Students also write first-year and second-year research papers. Those without teaching experience complete Business Administration 398T and teach an entry-level accounting course. Four or five years are generally needed to complete the coursework and dissertation phases of the degree program.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Accounting: ACC

#### ACC 180C. MPA Distinguished Speaker Lyceum.

Discussion of current issues confronting the accounting profession. Two lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and admission to the traditional approach to the Master in Professional Accounting program.

#### ACC 380D. Advanced Topics in Financial Reporting.

Examines issues in financial reporting from a user's perspective, including how important economic transactions of large public companies are reflected in financial statements. Three lecture hours a week for one semester. May not be counted by students with credit for Accounting 380K (Topic 1: Financial Accounting Standards and Analysis I) or 380K (Topic 2: Financial Accounting Standards and Analysis II). Prerequisite: Graduate standing, admission to the Master of Business Administration program, and Business Administration 384T.

#### ACC 180K, 280K, 380K. Contemporary Accounting Topics.

In-depth study of selected accounting topics. One, two, or three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

##### Topic 1: Financial Accounting Standards and Analysis I.

Accounting 326 and 380K (Topic 1) may not both be counted. Additional prerequisite: For students enrolled in the Master of Business Administration program, Business Administration 384T and 385T; for students enrolled in the traditional approach to the Master in Professional Accounting program, Accounting 381 or the equivalent

and credit or registration for Business Administration 385T or the equivalent; for students enrolled in the integrated approach to the Master in Professional Accounting program, Accounting 356 and Finance 357 or the equivalent.

##### Topic 2: Financial Accounting Standards and Analysis II.

Accounting 360 and 380K (Topic 2) may not both be counted. Additional prerequisite: Accounting 380K (Topic 1) or the equivalent or consent of instructor.

##### Topic 3: Financial Reporting Institutions and Regulations.

**Topic 4: Auditing and Other Assurance Services.** Only one of the following may be counted: Accounting 358C, 362, 380K (Topic 4). Additional prerequisite: Accounting 356, 381, Business Administration 384T, or the equivalent.

**Topic 5: Introduction to Management Advisory Services.** Additional prerequisite: Accounting 356, 381, Business Administration 384T, or the equivalent.

##### Topic 6: Issues in Accounting and Control for Nonprofit

**Organizations.** Accounting 361 and 380K (Topic 6) may not both be counted. Additional prerequisite: Accounting 356, 381, Business Administration 384T, or the equivalent.

**Topic 7: Financial Statement Analysis.** Accounting 327 and 380K (Topic 7) may not both be counted. Additional prerequisite: Accounting 356, 381, Business Administration 384T, or the equivalent.

**Topic 8: Petroleum Accounting: Principles, Procedures, and Issues.** Additional prerequisite: Accounting 356, 381, Business Administration 384T, or the equivalent.

**Topic 10: Tax Factors in Business Management.** Additional prerequisite: Accounting 356, 381, Business Administration 384T, or the equivalent.

**Topic 11: Introduction to Taxation.** Only one of the following may be counted: Accounting 355, 364, 380K (Topic 11). Additional prerequisite: For students enrolled in the Master of Business Administration program, Business Administration 384T; for students enrolled in the traditional approach to the Master in Professional Accounting program, credit or registration for Accounting 381 or the equivalent.

**Topic 12: Computer Auditing and Systems Security.** Additional prerequisite: Accounting 356, 381, Business Administration 384T, or the equivalent.

**Topic 13: Information Technology for Accounting and Control.** Additional prerequisite: Accounting 356, 381, Business Administration 384T, or the equivalent.

**Topic 14: Managing Information.** Additional prerequisite: Accounting 356, 381, Business Administration 384T, or the equivalent.

**Topic 15: Business and Systems Change.** Additional prerequisite: Accounting 356, 381, Business Administration 384T, or the equivalent.

**Topic 16: Cross-Functional Integrated Systems.** Additional prerequisite: Accounting 380K (Topic 15).

**Topic 17: Cross-Functional Project Management.** Additional prerequisite: Accounting 356, 381, Business Administration 384T, or the equivalent.

**Topic 18: Project Management in Fast-Cycle Environments.** Additional prerequisite: Accounting 356, 381, Business Administration 384T, or the equivalent.

**Topic 19: International Accounting Policies and Procedures.** Additional prerequisite: For students enrolled in the Master of Business Administration program, Business Administration 384T; for students enrolled in the traditional approach to the Master in Professional Accounting program, Accounting 381 or the equivalent; for students enrolled in the integrated approach to the Master in Professional Accounting program, Accounting 355, 356, 358C, and 359.

**Topic 20: International and European Accounting Standards.** Additional prerequisite: For students enrolled in the Master of Business Administration program, Business Administration 384T; for students enrolled in the traditional approach to the Master in Professional



Accounting program, Accounting 381 or the equivalent; for students enrolled in the integrated approach to the Master in Professional Accounting program, Accounting 355, 356, 358C, and 359.

**Topic 21: Global Teams.**

**Topic 22: Accounting and Auditing Research: Introduction to Design and Evaluation.** Designed to help students evaluate, formulate, and conduct scholarly research in financial reporting. Subjects include advantages of archival, experimental, and theoretical methods, evaluating validity of design, and overcoming research barriers. Accounting 380K (Topic: Accounting and Auditing Research: Introduction to Design and Evaluation) and 380K (Topic 22) may not both be counted.

**Topic 23: Accounting Issues in Measurement and Valuation.** Examines the predictive analytics of financial statement numbers and how these accounting forecasts, estimates and judgments are made in practice, and how external auditors evaluate them. Insights from financial economics, psychology, and statistics provide a foundation for exploring accounting and auditing measurement challenges such as customer behavior analytics for loan default or loyalty award redemption; actuarial methods for establishing product warranty or insurance reserves; fair value models for brand names, trade secrets, and customer relationships; and other applications involving uncertain accounting numbers. For each semester hour of credit earned, one lecture hour a week for one semester. Accounting 380K (Topic: Accounting Issues in Measurement and Valuation) and 380K (Topic 23) may not both be counted. Additional prerequisite: The following coursework: Accounting 356, 381, Business Administration 384T, or the equivalent; Accounting 380K (Topic 1) or 380D; and 358C or 380K (Topic 4).

**ACC 381. Financial Accounting.**

Concepts and issues involved in the preparation and interpretation of financial statements; the use of financial information to evaluate and control an organization. Three lecture hours a week for one semester. Accounting 381 and Business Administration 284T, 384T may not both be counted. Prerequisite: Graduate standing, admission to the traditional approach to the Master in Professional Accounting program, and Accounting 311 or the equivalent.

**ACC 381M. Financial Accounting Issues in Business Decisions.**

An integrative and intensive examination of financial accounting, with emphasis on management's alternative reporting strategies and investors' decisions. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Business Administration 384T or the equivalent.

**ACC 381N. Managerial Accounting and Financial Statement Analysis.**

Surveys the strategic uses of the most important elements of internal accounting systems, including cost accounting systems and management control systems used for planning and budgeting, and the use of publicly available financial accounting information to evaluate past performance, forecast future performance, and estimate the value of debt and equity securities. Meets all day on alternate Fridays and Saturdays. May not be counted by students with credit for Accounting 380K (Topic 7). Prerequisite: Graduate standing.

**ACC 382K. Studies in Accounting Information Systems.**

Quantitative and/or computerized applications to business problems; computer-based accounting information systems; analysis of optimizing models; simulation of important functional activities; large-scale simulation of the firm. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; Accounting 356, Accounting 381, Business Administration 384T, or the equivalent, or consent of instructor; and Accounting 359, Accounting 387

(Topic 1: Introduction to Managerial Accounting), or the equivalent, or consent of instructor.

**Topic 1: Principles of Systems Analysis.** Three lecture hours a week for one semester. Some sections require two laboratory hours a week as well; these sections are identified in the Course Schedule. Accounting 365 and 382K (Topic 1) may not both be counted.

**Topic 2: Computer Auditing.** Additional prerequisite: Accounting 358C or 380K (Topic 4: Introduction to Assurance Services), and Accounting 380K (Topic 13: Information Technology for Accounting and Control) or the equivalent.

**Topic 3: Topics in Accounting Systems and Control.**

**Topic 4: Database Management in Accounting.**

**Topic 5: Topics in Information Systems.**

**ACC 383K. Studies in Auditing.**

Professional and technical aspects of practice; ethics and legal responsibilities; review of fieldwork, emphasizing materiality, sampling, and working papers; reporting problems, including long-form and special purpose reports; fraud examination and audit methods. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 1: Studies in Auditing, MPA Program.** Additional prerequisite: Accounting 358C, 380K (Topic 4: Introduction to Assurance Services), or the equivalent, or consent of instructor.

**Topic 2: Management Auditing and Control.** Additional prerequisite: For students in the Master of Business Administration program, Business Administration 384T or the equivalent; for students in the traditional approach to the Master in Professional Accounting program, credit or registration for Accounting 381, Business Administration 384T, or the equivalent; for students in the integrated approach to the Master in Professional Accounting program, credit or registration for Accounting 358C or the equivalent.

**Topic 3: Auditing and Control, MBA Program.** Additional prerequisite: Accounting 387 (Topic 1: Introduction to Managerial Accounting) or the equivalent, and Business Administration 384T or the equivalent.

**Topic 4: Fraud Examination.** Additional prerequisite: For students in the Master of Business Administration program, Business Administration 384T or the equivalent; for students in the traditional approach to the Master in Professional Accounting program, Accounting 381, Business Administration 384T, or the equivalent, or consent of instructor; and Accounting 387 (Topic 1: Introduction to Managerial Accounting) or the equivalent, or consent of instructor; for students in the integrated approach to the Master in Professional Accounting program, Accounting 356 or consent of instructor, and Accounting 359 or the equivalent or consent of instructor.

**Topic 5: Topics in Auditing.** Additional prerequisite: Accounting 356, 359, 381, 387 (Topic 1: Introduction to Managerial Accounting), and Business Administration 384T, or their equivalents.

**Topic 6: Practicum.** Additional prerequisite: Credit or registration for Accounting 358C or 380K (Topic 4: Introduction to Assurance Services).

**ACC 384. Research and Planning in Federal Taxes.**

Advanced analysis in federal taxation, with emphasis on historical and current developments; application of research techniques to income tax and estate tax planning; case studies and reports. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and admission to the Master in Professional Accounting degree program or consent of instructor.

**Topic 1: Tax Research Methodology.** Additional prerequisite: For students in the integrated approach to the Master in Professional

Accounting program, Accounting 355 or the equivalent; for students in the traditional approach to the Master in Professional Accounting program, credit or registration for Accounting 380K (Topic 11: Introduction to Taxation) or the equivalent or consent of instructor.

**Topic 2: Taxation of Entities I.** Focuses on taxation of C corporations and their shareholders. Additional prerequisite: Credit or registration for Accounting 384 (Topic 1).

**Topic 3: Taxation of Entities II.** Focuses on flow-through entities, including partnerships. Additional prerequisite: Credit or registration for Accounting 384 (Topic 1).

**Topic 4: Tax Planning for Business Entities.** Additional prerequisite: Accounting 384 (Topic 2).

**Topic 5: Family Tax Planning--Estates, Trusts, and Gifts.** Additional prerequisite: Credit or registration for Accounting 384 (Topic 1) or consent of instructor.

**Topic 6: International and Interstate Taxation.** Additional prerequisite: Credit or registration for Accounting 384 (Topic 1).

**Topic 7: Fundamentals of Taxation--Advanced Topics.** Additional prerequisite: Accounting 355, 380K (Topic 11: Introduction to Taxation), or the equivalent.

**Topic 8: Miscellaneous Tax Topics.** Restricted to students enrolled in the tax internship program. Additional prerequisite: Accounting 384 (Topic 1) and consent of instructor.

### **ACC 386K. Studies in Accounting Theory.**

Financial accounting theory; current pronouncements on theory; problems of income determination; accounting research and research methodology applied to accounting issues. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, admission to the doctoral degree program in accounting, and consent of instructor.

**Topic 1: Contemporary Accounting Topics.**

**Topic 2: Introduction to Research Methodology in Accounting.**

**Topic 3: Empirical Research in Accounting.**

**Topic 4: Analytical Research in Accounting.**

**Topic 5: Behavioral Research in Accounting.**

**Topic 6: Doctoral Research Topics.** Offered on the credit/no credit basis only.

**Topic 7: Foundations of Financial Accounting Research.**

### **ACC 287, 387. Studies in Profit Planning and Control.**

The use of accounting information by managers within the organization for decision making, planning, and the design of control systems for implementing the organization's strategy. Topics include long-range planning, annual profit planning, activity-based costing, cost prediction, strategic control systems, and performance evaluation. Case studies are used. For 287, four lecture hours a week for half a semester; for 387, three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 1: Introduction to Managerial Accounting.** Only one of the following may be counted: Accounting 329, 359, 287 (Topic 1), 287 (Topic 5), 387 (Topic 1), 387 (Topic 5), Business Administration 382T.

**Topic 2: Topics in Profit Planning and Control.** Additional prerequisite: Accounting 359, 387 (Topic 1), or the equivalent.

**Topic 3: Strategic Cost.** Additional prerequisite: Accounting 359, 387 (Topic 1), or the equivalent.

**Topic 4: Strategic Control Systems.** Additional prerequisite: Accounting 359, 387 (Topic 1), or the equivalent.

**Topic 5: Performance Management and Control.** Only one of the following may be counted: Accounting 329, 359, 287 (Topic 1), 287 (Topic 5), 387 (Topic 1), 387 (Topic 5), Business Administration 382T.

### **ACC 191C, 291C, 391C, 691C. Special Studies in Accounting.**

Conference course. May be repeated for credit. Prerequisite: Graduate standing; admission to the Master in Professional Accounting program or the doctoral program in accounting; and consent of instructor.

### **ACC 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in the doctoral program in accounting and consent of the supervising faculty member and the graduate adviser; for 698B, Accounting 698A.

### **ACC 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in the doctoral program in accounting, completion of the core courses for the degree, and consent of the supervising faculty member and the graduate adviser.

### **ACC 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and fulfillment of the language requirement for the doctoral degree.

### **ACC 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Accounting 399R, 699R, or 999R.

## **Business, Government, and Society**

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## **Business, Government, and Society: BGS**

### **BGS 180, 380. Topics in Business, Government, and Society.**

For each semester hour of credit earned, one lecture hour a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

### **BGS 380C. Strategic Corporate Communication.**

Studies corporate efforts to inform, motivate, and persuade various constituencies, including investors, employees, communities, and regulators. Includes public relations, investor relations, and government relations. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **BGS 380D. Strategic Corporate Social Responsibility.**

A study of how corporations can engage in corporate social responsibility and sustainable activities to improve the world with strategic considerations kept in mind. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

### **BGS 380E. Global Political Economy.**

Exploration of how firms can successfully integrate their traditional strategies with non-market strategy in the global arena, including how to successfully engage with international non-market actors such

as foreign governments, regulators, political parties, NGOs, and the media. Examines the necessary tools to craft successful, integrated firm strategies in diverse institutional and political environments. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

### **BGS 281, 381. Law, Ethics, and Corporate Social Responsibility.**

Examines corporate responsibility issues and the tools necessary to manage relationships with external stakeholders such as governments, nongovernmental organizations, and communities in legal, political, and cultural contexts. Two or three lecture hours a week for one semester. Business, Government, and Society 381 and Legal Environment of Business 380 (Topic 36: Law, Ethics, and Corporate Social Responsibility) may not both be counted. Prerequisite: Graduate standing.

### **BGS 381L. Social and Ethical Responsibility of Business.**

Restricted to students admitted to the Master in Professional Accounting program. Examines ethical aspects of the managerial decision-making process and the application of fundamental ethical principles to business, legal, and social problems. Includes ethical implications of financial markets, race and gender discrimination, employee privacy, multinational business, and health, safety, environmental, and consumer issues. Three lecture hours a week for one semester. Business, Government, and Society 381L and Legal Environment of Business 380 (Topic 1: Social and Ethical Responsibility of Business) may not both be counted. Prerequisite: Graduate standing.

### **BGS 281M, 381M. Social and Ethical Responsibility of Business.**

Restricted to students in the Master of Business Administration program. Examines ethical aspects of the managerial decision-making process and the application of fundamental ethical principles to business, legal, and social problems. Includes ethical implications of financial markets, race and gender discrimination, employee privacy, multinational business, and health, safety, environmental, and consumer issues. Two or three lecture hours a week for one semester. Business, Government, and Society 381M and Legal Environment of Business 380 (Topic 1) may not both be counted. Prerequisite: Graduate standing.

### **BGS 382. Corporate Political Strategy.**

A study of how the political and regulatory environment enables and constrains business activity and how individual firms and groups of firms can ethically, yet effectively, lobby legislatures, negotiate with regulators, create industry associations, make campaign contributions, and engage in other political activity to gain competitive advantage. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

### **BGS 382D. Economics of Health Care.**

Explores the production and provision of health care in the United States. Includes the study of basic economic concepts, differences between health care and other goods, impact of regulatory policies, and the importance of health for economic development. May include international and ethical aspects of health care. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **BGS 382E. Energy Economics.**

Studies domestic and international policy issues of energy and the environment, with a focus on market solutions to various problems and market limitations in the allocation of environmental resources. Also examines the economics of fossil fuel alternatives. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **BGS 382L. Labor Economics.**

Studies the functioning of the labor market and examines determinants of wage and employment levels in perfect and imperfect labor markets. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **BGS 382R. Economic Analysis of Law.**

Uses economic analysis to study law and its impact on business activity. Includes the economics of contract law, tort law, property law, securities regulation, antitrust law, intellectual property, and environmental law. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **BGS 382S. Economics of Sustainable Business.**

Examines the policy and practical implications of sustainability. Topics covered may include property rights, air and water pollution, solid-waste disposal, hazardous substances, and wilderness preservation and the protection of endangered species. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **BGS 383. Business Ethics in the Global Market.**

Moral theory and its application to business issues in diverse cultures. Three lecture hours a week for one semester. Business, Government, and Society 383 and Legal Environment of Business 380 (Topic 28: Business Ethics in the Global Market) may not both be counted. Prerequisite: Graduate standing.

### **BGS 384. Global Macroeconomic Policy.**

Practical study of global macroeconomic policy, including monetary policy, financial market regulation, and economic growth and development policies. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **BGS 385. Business, Government, and Public Policy.**

Studies the relationship between business and government throughout the policy process and examines the constitutional constraints that affect businesses across different political and legal systems. Explores ethical issues of the role of business in the policy process. Three lecture hours a week for one semester. Business, Government, and Society 385 and Legal Environment of Business 380 (Topic 34: Business, Government, and Public Policy) may not both be counted. Prerequisite: Graduate standing and admission to the Master of Business Administration program.

### **BGS 385W. Business, Government, and Public Policy: Washington Campus.**

Restricted to students in the executive Master of Business Administration program. Studies the relationship between business and government throughout the formation and implementation of public policy; includes examination from economic, political, legal, and behavioral perspectives. Focuses primarily on the political, regulatory, and legal system of the United States and addresses issues covered further in the Washington Campus event, a week-long seminar with policy makers in Washington DC that precedes the course. The equivalent of three lecture hours a week for one semester. Business, Government, and Society 385W and Legal Environment of Business 380 (Topic 35: Business, Government, and Public Policy: Washington Campus) may not both be counted. Prerequisite: Graduate standing.

### **BGS 386. Market Structure and Performance.**

Studies industrial organization economics using game-theory to model strategic market behavior. Examines econometric methods used to test hypotheses regarding firm conduct and market performance. Explores profit-maximizing business strategies of firms with market power and strategic interactions among firms in imperfectly competitive markets.

Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **BGS 389. Environmental Regulation of Business.**

Examines federal and state regulation of business activities that affect the environment and the potential liability of business for environmental damage. Three lecture hours a week for one semester. Business, Government, and Society 389 and Legal Environment of Business 380 (Topic 15: Environmental Regulation of Business) may not both be counted. Prerequisite: Graduate standing.

### **BGS 390. Behavioral and Institutional Economics.**

Uses aspects of the social sciences, including economics, psychology, and sociology to explore the evolution of economic organizations, the need for business regulation, bubbles and speculation, and economic herd behavior. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **BGS 390E. Business in the Global Political Environment.**

Examines global business from a political science perspective. Includes the politics of international trade and investment and the regulatory expectations of national regulators and of international organizations such as the World Trade Organization and the World Bank. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **BGS 390F. Federal Regulatory Policy.**

Studies the federal regulatory framework in the United States, including the processes through which regulations are promulgated and the stakeholders involved. Particular emphasis on cost-benefit analysis. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **BGS 390J. Modern Political Economy.**

Studies economic theory from Adam Smith to the modern day, with a focus on the interrelationship between economic models and political behavior. Explores the development of American capitalism; includes works from Marx, Hayek, Polanyi, and Williamson. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **BGS 191, 291, 391, 691. Conference Course in Business, Government, and Society.**

Individual instruction. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

## **Finance**

*Master of Science in Finance  
Doctor of Philosophy*

### **For More Information**

**Campus address:** College of Business Administration Building (CBA) 6.222, phone (512) 471-4368, fax (512) 471-5073; campus mail code: B6600

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Finance, 2110 Speedway Stop B6600, Austin TX 78712

**PhD program e-mail:** [finphd@mcombs.utexas.edu](mailto:finphd@mcombs.utexas.edu)

**PhD program URL:** <http://www.mcombs.utexas.edu/Departments/Finance/PhD>

**MSF program e-mail:** [msfinance@mcombs.utexas.edu](mailto:msfinance@mcombs.utexas.edu)

**MSF program URL:** <http://www.mcombs.utexas.edu/msf.aspx>

## **Facilities for Graduate Work**

Faculty members and graduate students in finance are involved in the work of several research centers: the AIM Investment Center; the Center for Energy Finance Education and Research (CEFER); the Hicks, Muse, Tate & Furst Center for Private Equity Finance; and the Real Estate Finance and Investment Center. Additional research centers that support graduate work in the McCombs School, as well as the school's physical facilities and computing systems, are described in the Business Administration section under Facilities for Graduate Work (p. 41).

## **Areas of Study**

The graduate program in finance gives students opportunities for specialized study in behavioral finance, corporate finance, investments, financial intermediaries, international finance, energy, and finance and real estate.

## **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Andres Almazan	Travis Lake Johnson
Aydogan Altı	Samuel Arthur Kruger
Fernando Antonio Nunes Dionisio	Tim Landvoigt
Anjos	James Richard Lowery Jr
Keith C Brown	Stephen P Magee
Jonathan B Cohn	Robert Parrino
Andres Francisco Donangelo	Ramesh K Rao
Cesare Fracassi	Ehud I Ronn
George W Gau	Jan Schneider
Thomas W Gilligan	Clemens Sialm
John M Griffin	Lewis J Spellman
Beverly L Hadaway	Laura T Starks
Jay C Hartzell	Sheridan Titman
John William Hatfield	

## **Admission Requirements**

Admission to the program is extremely competitive. The admission decision is based on the applicant's academic record, test scores, personal statement, résumé, and letters of recommendation.

Students must enter the PhD program in the fall semester. Students must enter the Master of Science in Finance Option III program in the summer semester.

## **Degree Requirements**

### **Master of Science in Finance**

The Master of Science in Finance is offered in three options: with thesis, with report, and without thesis or report. The thesis option requires at least thirty semester hours of credit; the report option, at least thirty-three hours; and the option without thesis or report, at least thirty-six hours. The Master of Science in Finance Option III requires thirty-six hours and is without thesis or report. All coursework must be logically related, and the student's entire program must be approved by the student's primary adviser and the graduate adviser. The Graduate Studies Committee's approval is not required.

### **Doctor of Philosophy**

The core of the program is a set of courses required of all students. The core is supplemented with special courses and electives. Students are required to study one minor field in addition to finance; typically, they

choose economics, statistics, or mathematics, all of which provide skills important to financial research.

A required element of the student's development as a scholar is the completion of first- and second-year summer papers. The quality of these two papers is a factor in judging the student's progress in the program. Students must take a comprehensive examination at the end of their second year. They then undertake dissertation research.

Students normally complete coursework, research, and the dissertation in approximately five years.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Finance: FIN

#### FIN 286. Valuation.

Study of subjects such as financial modeling, derivatives in corporate finance, business valuation, and value-based management. Four lecture hours a week for half a semester. Prerequisite: Graduate standing and Business Administration 285T or 385T.

#### FIN 290, 390. Seminar: Money and Capital Markets.

For each semester hour of credit earned, one lecture hour a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, Business Administration 285T or 385T, Finance 286, and credit or registration for Finance 394 (Topic 1: Advanced Corporate Finance) and 397 (Topic 1: Investment Theory and Practice).

**Topic 1: Financial Markets and Institutions.** How financial markets are organized and function. Includes debt equity and foreign exchange markets, primary and secondary market operations, and investment banking.

**Topic 2: Special Topics in Capital Markets and Financial Institutions.** Study of issues and topics in the capital markets and financial institutions that are not covered in other courses.

#### FIN 294, 394. Seminar: Financial Management and Theory.

For each semester hour of credit earned, one lecture hour a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and Business Administration 285T or 385T.

**Topic 1: Advanced Corporate Finance.** Advanced corporate financial management in the global marketplace: valuation concepts, optimal capital structure, risk management, corporate control and restructuring, and mergers and acquisitions. Additional prerequisite: Credit or registration for Finance 286.

**Topic 2: Financial Strategies.** An integrated analysis of the interaction between the investment and operating policies of a corporation and its financial strategies. Additional prerequisite: Finance 286, 394 (Topic 1), and credit or registration for Finance 397 (Topic 1: Investment Theory and Practice).

**Topic 3: Global Finance.** Additional prerequisite: Finance 286, 394 (Topic 1), and 397 (Topic 1: Investment Theory and Practice).

**Topic 4: Financial Management of Small Business.** Additional prerequisite: Finance 286.

**Topic 6: Special Topics in Corporate Finance.**

**Topic 7: Raising Capital.** An analysis of the decision to raise capital, including sources of debt and equity, financial distress, restructuring, and financing acquisitions. Offered on the letter-grade basis only. Additional prerequisite: Finance 286, 394 (Topic 1: Advanced Corporate Finance), and credit or registration for Finance 397 (Topic 1: Investment Theory and Practice).

**Topic 8: Financial Strategies for Energy Firms.** An integrated analysis of the interaction between the investment and operating policies of a corporation and its financial strategies, with special emphasis on firms in the energy industry. Offered on the letter-grade basis only. Additional prerequisite: Finance 286, 394 (Topic 1: Advanced Corporate Finance), and credit or registration for Finance 397 (Topic 1: Investment Theory and Practice).

**Topic 9: Advanced Valuation and Financial Modeling for Energy Firms.** Construction and use of financial models for valuation and decision-making, with applications to the energy industry. Offered on the letter-grade basis only. Additional prerequisite: Finance 286, 394 (Topic 1: Advanced Corporate Finance), and 397 (Topic 1: Investment Theory and Practice).

**Topic 11: Private Equity.** An examination of the application of advanced corporate finance concepts in the private equity markets. Additional prerequisite: Finance 286, 394 (Topic 1: Advanced Corporate Finance), and credit or registration for Finance 397 (Topic 1: Investment Theory and Practice).

**Topic 12: Energy Development and Corporate Strategies.** Introduction to the legal, engineering, business, and financial aspects of energy development and operations. Additional prerequisite: Finance 286 and credit or registration for Finance 394 (Topic 1: Advanced Corporate Finance).

**Topic 14: Venture Capital Fellows Program.** Additional prerequisite: Credit or registration for Finance 286 and 394 (Topic 1).

**Topic 15: Energy Finance Practicum.** Additional prerequisite: Credit or registration for Finance 286.

**Topic 16: Corporate Finance and Financial Markets.** Restricted to students admitted to the McCombs School of Business.

**Topic 17: Advanced Valuation and Financial Modeling.** Construction and use of financial models for valuation and decision-making. Additional prerequisite: Finance 286, 394 (Topic 1: Advanced Corporate Finance), and 397 (Topic 1: Investment Theory and Practice).

#### FIN 395. Finance Doctoral Seminar.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Fundamentals of Financial Theory.** An overview of finance theory and empirical evidence.

**Topic 2: Uncertainty in Economics and Finance.** The notions of risk, risk aversion, prudence, arbitrage, and equilibria in economies that include financial markets. The impact of adverse selection and moral hazard problems on the existence and properties of market equilibria.

**Topic 3: Asset Pricing Theory.** Detailed introduction to asset pricing theory, focusing on absence of arbitrage, consumption-portfolio choice, and simple equilibrium models.

**Topic 4: Empirical Methods in Asset Pricing.** In-depth study of existing empirical work in asset pricing, including econometric and statistical methods.

**Topic 5: Corporate Finance.** Analysis of the theory of corporate finance and empirical evidence regarding corporate finance.

**Topic 6: Current Research Topics in Finance.** Restricted to doctoral students in finance. Offered on the credit/no credit basis only.

**Topic 7: Summer Research Topics.** Restricted to doctoral students in finance. Provides an opportunity for students to develop and conduct original research projects.

**Topic 8: Special Topics in Finance Theory.**

**Topic 9: Applied Finance Research.** Restricted to doctoral students in finance. Provides an opportunity for students to develop and conduct original research.

**Topic 10: Empirical Methods in Corporate Finance.** Restricted to doctoral students. In-depth study of existing empirical work in corporate finance, including econometric and statistical methods.

### **FIN 297, 397. Seminar: Investment Theory and Management.**

For each semester hour of credit earned, one lecture hour a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and Business Administration 285T or 385T.

**Topic 1: Investment Theory and Practice.** Analysis of the investment decision-making process, asset allocation, security analysis, risk and expected return measurement, asset-pricing models, and international investment. Additional prerequisite: Credit or registration for Finance 286.

**Topic 2: Portfolio Management and Security Analysis.** Modern practices in managing investment portfolios, portfolio optimization methods, asset management for individual and institutional investors, and valuation of equity securities. Additional prerequisite: Finance 286 and 397 (Topic 1), and credit or registration for Finance 394 (Topic 1: Advanced Corporate Finance).

**Topic 4: Financial Risk Management.** Studies how firms manage their financial risk exposures and how they use derivative securities. Additional prerequisite: Finance 286 and 397 (Topic 1), and credit or registration for Finance 394 (Topic 1: Advanced Corporate Finance).

**Topic 5: Fixed Income Analysis.** Comprehensive analysis of debt securities and the techniques used to value these instruments.

Additional prerequisite: Finance 286 and 397 (Topic 1), and credit or registration for Finance 394 (Topic 1: Advanced Corporate Finance).

**Topic 6: Special Topics in Investments.** Issues and topics in the investment area that are not covered in other courses. Additional prerequisite: Finance 286 and 397 (Topic 1), and credit or registration for Finance 394 (Topic 1: Advanced Corporate Finance).

**Topic 7: Derivative Securities.** Analysis and pricing of derivative securities, including forwards, futures, and options. Offered on the letter-grade basis only. Additional prerequisite: Finance 286 and 397 (Topic 1: Investment Theory and Practice).

**Topic 8: Energy Derivatives.** Analysis and pricing of derivative securities, including forwards, futures, and options, with emphasis on derivatives related to the energy industry. Offered on the letter-grade basis only. Additional prerequisite: Finance 286 and 397 (Topic 1: Investment Theory and Practice).

**Topic 9: Alternative Investments.** Overview of alternative investments, including hedge funds, private equity, and real estate. Offered on the letter-grade basis only. Additional prerequisite: Finance 286 and 397 (Topic 1: Investment Theory and Practice).

### **FIN 397P. Investments Practicum.**

Project-based study with a focus on the application of finance principles to practical investment problems. At least fifteen lecture hours and sixty hours of project work scheduled throughout the semester. Prerequisite: Graduate standing.

### **FIN 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in finance and consent of the graduate adviser; for 698B, Finance 698A.

### **FIN 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for

one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in finance and consent of the supervising faculty member and the graduate adviser.

### **FIN 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and fulfillment of the language requirement for the doctoral degree.

### **FIN 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Finance 399R, 699R, or 999R.

## **Real Estate: R E**

### **R E 386. Seminar in Real Estate Analysis.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Business Administration 285T or 385T, and credit or registration for Finance 286.

**Topic 1: Real Estate Markets.** Overview of real estate principles, markets, and valuation. Introduction to the major types of commercial property, methods of analyzing real estate markets and investments, urban economics, and real estate institutions.

**Topic 2: Real Estate Investment Decisions.** In-depth coverage of approaches used to analyze real estate investments, including debt and equity. Additional prerequisite: Real Estate 386 (Topic 1).

**Topic 3: Real Estate Analysis.** Additional prerequisite: Finance 394 (Topic 1: Advanced Corporate Finance), 397 (Topic 1: Investment Theory and Practice), and Real Estate 386 (Topic 1); or consent of instructor.

**Topic 7: Real Estate Decision Making.** Additional prerequisite: Real Estate 386 (Topic 1).

### **R E 388. Seminar in Real Estate Finance.**

Current aspects of real estate finance as they affect lenders, borrowers, and investors. Institutional changes affecting trends in real estate finance are presented within a decision-making framework. Special emphasis on real estate capital markets, public and private debt, and equity. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **R E 389. Real Estate Practicum.**

Project-based study with a focus on the application of real estate and finance principles to practical problems. At least fifteen lecture hours and sixty hours of project work scheduled throughout the semester. Prerequisite: Graduate standing, Business Administration 285T or 385T, Real Estate 386 (Topic 1: Real Estate Markets), and credit or registration for Finance 286.

## **Information, Risk, and Operations Management**

*Master of Science in Information, Risk, and Operations Management*

*Master of Science in Business Analytics*

*Doctor of Philosophy*

### **For More Information**

**Campus address:** College of Business Administration Building (CBA) 5.202, phone (512) 471-3322, fax (512) 471-0587; campus mail code: B6500

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Information, Risk, and Operations Management, 2110 Speedway B6500, Austin TX 78712-1277

**MS Business Analytics e-mail:**

msbusinessanalytics@mcombs.utexas.edu

**PhD program e-mail:** iromphd@mcombs.utexas.edu**MS Business Analytics program URL:** <http://www.mcombs.utexas.edu/Business-Analytics>**PhD program URL:** <http://www.mcombs.utexas.edu/Departments/IROM/Degree-Programs/PhD>

## Facilities for Graduate Work

Faculty members and graduate students in information, risk, and operations management are involved in the work of the Center for Business, Technology, and Law, the Center for Research in Electronic Commerce, the risk management and insurance program, and the Supply Chain Center of Excellence. Additional research centers that support graduate work in the McCombs School, as well as the school's physical facilities and computing systems, are described in the business administration section under Facilities for Graduate Work (p. 41).

## Areas of Study

The master's and doctoral programs have three independent concentrations: information systems; risk analysis and decision making; and supply chain and operations management. The master's Option III program has one concentration: business analytics.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Paul C Adams	Douglas J Morrice
Susan N Beretvas	Peter Mueller
J Eric Bickel	Marc A Musick
Patrick L Brockett	Daniel A Powers
Carlos Marinho Carvalho	William H Press
Lawrence K Cormack	Pradeep Ravikumar
Paul Damien	Brian E Roberts
Michael Daniels	Maytal Saar-Tsechansky
Inderjit S Dhillon	Thomas W Sager
Dragan Djurdjanovic	Purnamrita Sarkar
Betsy S Greenberg	Sahotra Sarkar
John J Hasenbein	James G Scott
Stephen A Jessee	Thomas S Shively
Timothy H Keitt	Chandler W Stolp
David A Kendrick	Paul Von Hippel
Lizhen Lin	Stephen G Walker
Tse-Min Lin	Claus O Wilke
John E Luecke	Sinead Williamson
Robert C Luskin	Mingyuan Zhou
Lauren A Meyers	

## Admission Requirements

Admission to information, risk, and operations management programs is extremely competitive. The admission decisions are based on the applicant's academic record, test scores, personal statement, résumé, and letters of recommendation. Students must enter the PhD program in the fall semester.

The admissions timeline for the Master of Science in Business Analytics Option III program is separate from other degrees in the department.

# Degree Requirements

## Master of Science in Business Analytics

The Master of Science in Business Analytics Option III program is a stand-alone program for students pursuing specialization in business analytics. Coursework is designed to include technical and quantitative methods from multiple disciplines, such as information management, statistics, optimization, and computer science, to solve business problems using large data sets. The program ends with a capstone project. Graduate programs in the Department of Information, Risk, and Operations Management (IROM) are overseen by the IROM Graduate Studies Committee (GSC). The IROM GSC has delegated operational authority over the MSBA program to a Program Committee consisting of faculty who teach in the program from the IROM department as well as other departments. The Program Committee determines degree requirements and rules for registration which are communicated to students in a handbook.

## Master of Science in Information, Risk, and Operations Management

The Master of Science in Information, Risk, and Operations Management is offered only to students who are enrolled in the doctoral program in information, risk, and operations management. This degree is offered in three options: with thesis, with report, and without thesis or report. The thesis option requires at least thirty semester hours of coursework; the report option, at least thirty-three hours; and the option without thesis or report, at least thirty-six hours. All coursework must be logically related, and the student's entire program must be approved by the student's primary adviser and the graduate adviser. The Graduate Studies Committee's approval is not required.

## Doctor of Philosophy

The doctoral program in information, risk, and operations management has three areas of concentration: information systems, risk and decision making, and supply chain and operations management. Degree requirements vary slightly among these. After the first year, each student must pass a qualifying examination that is based on the core courses in the appropriate area of concentration. Students concentrating in information systems must complete a first-year research paper.

In the second and third years of the program, students complete core coursework and take other methodological and contextual courses in the areas of their research interest. Although students are expected to begin working on research as soon as possible, they will spend increasing amounts of time on research as they progress through the second and third years. At the end of the second year, students in the information systems and risk and decision making areas of concentration complete a candidacy paper; students in the supply chain and operations management area of concentration complete a comprehensive examination that includes a research paper.

Following the candidacy research paper or the comprehensive exam, students undertake dissertation research, which concludes in a written dissertation and an oral defense before the student's dissertation committee. Students in the risk analysis and decision making or the supply chain and operations management areas of concentration must also pass an oral defense of their dissertation proposal prior to the final dissertation defense. For students in the information systems area of concentration, the requirement for a dissertation proposal is left to the discretion of the student's adviser.

# Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## Management Information Systems: MIS

### MIS 380. Seminar in Organizational Communication.

Selected topics in organizational communication, written and oral. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Research Methodology in Business and Organizational Communication.**

**Topic 2: Projects, Proposals, and Presentations.** Communicating effectively in business using advanced writing and presentation concepts and techniques to increase individual and team effectiveness.

**Topic 3: Advanced Report Writing, Professional Reports, and Other Scholarly Papers.**

### MIS 380N. Topics in Information Management.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 2: Managing Information.** Understanding, designing, and controlling the information processing activities of an organization. Complements Business Administration 380C by focusing on information systems rather than information technology. Includes business intelligence, knowledge management, data modeling, group decision support systems, and electronic commerce. Offered on the letter-grade basis only. Additional prerequisite: Business Administration 380C.

**Topic 3: Business Process Excellence.** Emerging technology, data and process modeling (flow focus for integrated applications), reengineering, and change management. Offered on the letter-grade basis only. Additional prerequisite: Business Administration 380C.

**Topic 4: Digital Economy and Commerce.** Offered on the letter-grade basis only. Additional prerequisite: Management Information Systems 380N (Topic 2) and credit or registration for Management Information Systems 380N (Topic 3).

### MIS 381N. Topics in Information Systems.

Selected topics in information technology and management of information systems development. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Introduction to Data Management.**

**Topic 2: Research in Information Systems: Organizational and Behavioral Perspectives.**

**Topic 3: Strategic Analysis for High-Tech Industries.** Management 385 (Topic 9: Strategic Analysis for High-Tech Industries) and Management Information Systems 381N (Topic 3) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Management Information Systems 380N (Topic 2: Managing Information), 380N (Topic 3: Managing Systems), and credit or registration for Management Information Systems 380N (Topic 4: Digital Economy and Commerce).

**Topic 4: Decision Support Systems.**

**Topic 5: Information Systems Design and Implementation.** Offered on the letter-grade basis only. Additional prerequisite: Management

Information Systems 380N (Topic 2: Managing Information), 380N (Topic 3: Managing Systems), and credit or registration for Management Information Systems 380N (Topic 4: Digital Economy and Commerce).

**Topic 6: Research Seminar.**

**Topic 7: Information and Knowledge Management.** Additional prerequisite: Management Information Systems 380N (Topic 2: Managing Information), 380N (Topic 3: Managing Systems), and credit or registration for Management Information Systems 380N (Topic 4: Digital Economy and Commerce).

**Topic 8: Managing Disruptive Innovations.** Focuses on the management of disruptive technologies, including analyzing whether an emerging technology is sustaining or disruptive, identifying new markets for disruptive technologies, justifying investments in disruptive technologies, implementing disruptive technologies, and appropriating value from them. Offered on the letter-grade basis only.

**Topic 9: Change Management Practicum I.** Project-oriented course focusing on design of organizational change.

**Topic 10: Change Management Practicum II.** Project-oriented course focusing on implementation of organizational change. Additional prerequisite: Management Information Systems 381N (Topic 9).

**Topic 11: Research in Information Technology.**

**Topic 12: Advanced Information Systems Readings.**

**Topic 13: Advanced Data Communications.** Additional prerequisite: Management Information Systems 381N (Topic 8).

**Topic 14: Global Information Technology Management.**

**Topic 15: Introduction to Electronic Commerce.**

**Topic 16: Information Systems Projects.**

**Topic 17: Client/Server Development.**

**Topic 18: Innovation, Technology, and Commercialization.**

**Topic 19: Technology Transfer: Theory and Practice.**

**Topic 20: Cross-Cultural Issues in Information Systems.**

**Topic 21: Seminar in Multimedia Systems.**

**Topic 22: Information Technology Strategy and Services.** Offered on the letter-grade basis only. Additional prerequisite: Management Information Systems 380N (Topic 2: Managing Information), 380N (Topic 3: Managing Systems), and credit or registration for Management Information Systems 380N (Topic 4: Digital Economy and Commerce).

**Topic 23: E-Business: Strategy and Policy.** The responsibilities of the strategist for choosing, developing, and managing an overall e-business firm strategy in uncertain market, technology, and policy environments.

**Topic 24: Global E-Business: Theory and Cases.** Analysis of case studies, incorporating Oracle and other Web-based distributed computing solutions. Additional prerequisite: Consent of instructor.

**Topic 25: E-Security and E-Forensic Frameworks.** Discussion and hands-on use of current Web and distributed computing security software and e-forensic solutions. Additional prerequisite: Consent of instructor.

**Topic 26: Research Methods in Information Systems.** Restricted to doctoral students. Overview of research methods used to study information systems problems. Fundamental concepts and criteria for use with and evaluation of quantitative and qualitative, positivist and interpretive research methods. Current state-of-the-art applications.

**Topic 27: Strategies for Networked Economy.** Analyzes the competitive dynamics of platform-mediated networks; explores innovations like cloud computing in supporting network-based competition, the implications of information technology-enabled global sourcing, and business intelligence for business value and competitive advantage; and discusses the role of information technology in business transformation and making a case for information technology investments.



### **MIS 382N. Topics in Information Management.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Managing Financial Information.** Data modeling and information management for investment analysis and financial systems.

**Topic 2: E-Business Change.** Offered on the letter-grade basis only.

**Topic 3: E-Business Application Development.**

**Topic 4: Cross-Functional Systems Integration.** Additional prerequisite: Management Information Systems 380N (Topic 2: Managing Information), 380N (Topic 3: Managing Systems), and credit or registration for Management Information Systems 380N (Topic 4: Digital Economy and Commerce).

**Topic 5: Managing Complexity.**

**Topic 6: Computer Auditing and Systems Security.**

**Topic 7: Project Management in Fast-Cycle Environments.**

**Topic 8: Balanced Scoreboard: An Information Systems Perspective.** Theory and tools that support the design and implementation of balanced scoreboard evaluation systems.

**Topic 9: Business Data Analytics with Data Mining.**

**Topic 10: Data Mining for Marketing.**

**Topic 11: Business Intelligence Capstone.** Explores foundations of business analytics related to database management, data analysis techniques, and business decision making to solve a business problem of a client. Additional prerequisite: Consent of instructor.

**Topic 12: Social Media Analytics.** An introduction to social network analysis for business value using statistical optimization and decision theory, including the foundation for analyzing online search and conversation data for market sensing, sentiments, product quality, reputation, recommendations, and brand awareness. Additional prerequisite: Consent of instructor.

### **MIS 383N. Topics in Information-Intensive Business Processes.**

Topics in management of information in specific industries or application areas. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Health Care Management.**

**Topic 2: Health Services Seminar.**

**Topic 3: Customer Insights.**

**Topic 4: Supply Chain Management.**

**Topic 5: Computer Tools for Investment Science.**

**Topic 6: Trading-Floor Technology.**

**Topic 10: Practicum in Multimedia Systems Development.**

Restricted to MBA and MPA students who have chosen the information management concentration. Additional prerequisite: Business Administration 380C and consent of instructor.

**Topic 12: E-Business Innovation.**

**Topic 13: Managing Innovation in a Global Company.** Examines innovation-based business strategies that rely on internal and external sources, processes in different organization forms, and market structures.

### **MIS 184N, 284N, 384N. Topics in Business Analytics.**

Restricted to students admitted to the Master of Science in Information, Risk, and Operations Management. Selected topics in business analytics. One, two, or three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate Standing; additional prerequisites vary with the topic.

### **MIS 385. Management Information Systems.**

Overview of hardware and software life cycles; in-depth considerations of program design, including experience programming for large-scale

computer systems in COBOL, FORTRAN, and/or BASIC. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **MIS 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in information, risk, and operations management and consent of the graduate adviser; for 698B, Management Information Systems 698A.

### **MIS 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in information, risk, and operations management and consent of the supervising faculty member and the graduate adviser.

### **MIS 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and fulfillment of the language requirement for the doctoral degree.

### **MIS 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Management Information Systems 399R, 699R, or 999R.

## **Operations Management: O M**

### **O M 380. Seminar in Operations Management.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 1: Combinatorial Optimization.** Concepts of computational complexity; the foundation of discrete mathematics and combinatorial theory.

**Topic 2: Linear Programming.** Model formulation: solution algorithms; duality theory; decomposition; sparse matrix issues; sensitivity and parametric analysis; optimization and matrix generation computer software.

**Topic 3: Network Optimization.** Applications, theory, and algorithms of the shortest path, maximum flow, and minimum cost flow problems. Discussion of classic and contemporary aspects of network optimization, including auction algorithms and cost-scaling techniques, to provide an integrated view of theory, algorithms, and applications. Additional prerequisite: Coursework in linear algebra and introductory coursework in operations management.

**Topic 4: Algorithms and Implementations.** Design, analysis, implementation, and use of computer algorithms. Introduction to fundamental data structures, sorting, recursive programs, dynamic data structures, memory management, algorithm design techniques and complexity analysis, and applications in optimization problems. Examples from linear and integer programming, covering, knapsack, graph-theoretic problems, network analysis, and scheduling.

**Topic 5: Business Process Simulation.** Modeling with simulation languages; random number generation; statistical analysis of input and output; variance reduction techniques; computer software applications. Additional prerequisite: Introductory coursework in operations management and statistics.

**Topic 6: Integer Programming.** Mathematical programming models with discrete (integer) decision alternatives. Model formulation and solution algorithms. Additional prerequisite: Coursework in linear programming.

**Topic 7: Nonlinear Programming.** Optimization of nonlinear functions of many variables subject to linear or nonlinear constraints. Basic theory, solution algorithms, applications, computer software. Additional prerequisite: Coursework in advanced calculus and linear algebra.

**Topic 8: Large-Scale System Optimization.** Formulation and solution of large mathematical optimization models. Focus on algorithms that exploit special structure of linear and nonlinear programming models. Applications. Additional prerequisite: Coursework in advanced calculus and linear programming.

**Topic 9: Stochastic Processes.** Discrete stochastic systems, queueing processes, inventory models, replacement, renewal theory, Markovian processes. Additional prerequisite: Mathematics 362K or the equivalent; completion of calculus and mathematical statistics and probability is recommended.

**Topic 10: Queueing Systems.** Deterministic queues, priorities, random walks, networks, approximations, and applications. Additional prerequisite: Operations Management 380 (Topic 9) or the equivalent.

**Topic 11: Graduate Seminars.** Required for doctoral students in operations management.

**Topic 12: Logistics.** Tools and concepts for the management of the flow of information, material, product, and cash between the initial suppliers of raw material and the ultimate consumers of finished goods.

**Topic 13: Management Planning and Control of Complex Systems.** Designed to provide guidance to doctoral students interested in research on new approaches to management planning and control of complex systems, and to MBA students interested in evaluating new practices currently being used in management planning and control activities.

**Topic 15: Optimization I.** Introduction to operations research and optimization, including linear programming, network models, deterministic dynamic programming, decisions under uncertainty, game theory, inventory models, and simulation. Emphasis on mathematical programming models and algorithmic approach of operations research problems.

**Topic 16: Optimization II.** Designed to provide students, especially those involved in research, with more advanced optimization tools in several broad areas. Includes nonlinear programming, graph theory, integer programming, Markov chains, probabilistic dynamic programming, queueing theory, and metaheuristics. Emphasis on mathematical programming modeling and algorithmic approach of operations research problems. Additional prerequisite: Operations Management 380 (Topic 15).

**Topic 17: Supply Chain Analytics.** Supply chain analytics combines analytical tools with technology to identify trends, compare performance and highlight improvement opportunities in supply chain areas including sourcing, inventory management, manufacturing, quality, sales and logistics. Additional prerequisite: Consent of instructor.

#### **O M 184, 284, 384. Topics in Business Analytics.**

Restricted to students admitted to the Master of Science in Information, Risk, and Operations Management (MSIROM) program. Selected topics in business analytics. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### **O M 386. Current Issues in Operations Management.**

Strategic problems, policies, models, and concepts for the design and control of new or existing operations systems. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Service Management.**

**Topic 2: Supply Chain and Operations Strategy.**

**Topic 3: Strategic Quality Management.**

**Topic 4: Operations Practicum.**

**Topic 5: Managing Projects.**

**Topic 6: Decision-Support Modeling.** Operations research and modeling to assist in decision making through building data models and operations research software systems. Management Information

Systems 383N (Topic: Decision-Support Modeling) and Operations Management 386 (Topic 6) may not both be counted.

#### **O M 392. Seminar: Operations Management.**

Intensive analysis of operations management issues. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Admission to the doctoral degree program and consent of instructor.

##### **Topic 1: Operations Management Colloquium.**

### **Risk Management: R M**

#### **R M 391. Topics in Decision Analysis.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 1: Decision Analysis.** Descriptive and normative principles of decision making. Additional prerequisite: Admission to the PPA or MPA program or consent of instructor.

**Topic 2: Managing Decisions under Risk.** State-of-the-art methods and tools to analyze risky decisions and design optimal strategies. Practical knowledge and practice are emphasized.

**Topic 3: Research Issues in Decision Making.** Talks by students and faculty members with research interests in decision making, and group discussion of the talks and of students' decision-related research. Additional prerequisite: Admission to the doctoral program in the Department of Information, Risk, and Operations Management.

**Topic 4: Behavioral Decision Theory.** The psychology of decision making: how and why our judgments are more fallible than we ordinarily suppose, and the extent to which predictive judgment can be improved through use of normative strategies that tell us how we should make judgments and decisions.

#### **R M 392. Topics in Quantitative Finance.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Financial Modeling and Optimization.**

**Topic 2: Statistics for Finance.**

**Topic 3: Financial Engineering.**

**Topic 4: Mathematical Finance.**

**Topic 5: Computational Finance.**

#### **R M 194, 294, 394. Topics in Business Analytics.**

Restricted to students admitted to the Master of Science in Information, Risk, and Operations Management program. Selected topics in business analytics. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### **R M 395. Seminar: Risk Management.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Corporate Risk Management.** Analysis of risk management and security needs of businesses and individuals; related insurance coverages and other tools available to deal with risk.

**Topic 2: Financial and Economic Aspects of Risk Management.**

Analysis of risk management techniques and insurance company operations. Similarities between insurance pricing techniques and risk management methodology.

**Topic 3: Risk Management and Finance.** Examination of theories underlying risk management techniques for business and insurance mechanisms; theoretical analysis of problems and practices in risk management.

**Topic 5: Managing Environmental Risk.**

**Topic 6: Risk Analysis and Management.**

**Topic 7: Managing International Risk.** The global aspects of risk management; basic risk and crisis management principles pertinent to multinational firms; financially, legally, and culturally multinational marketplaces such as reinsurance markets, captive offshore insurance.

**Topic 8: Managing Employee Risks and Benefits.** Corporate planning and public policy issues associated with employee benefits.

## Statistics: STA

### STA 380. Seminar in Business Statistics.

Selected topics in the applications of statistical methods to business problems. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 1: Correlation and Regression Analysis.**

**Topic 2: Design of Experiments.**

**Topic 3: Statistical Computing with SAS.**

**Topic 4: Nonparametric Methods.**

**Topic 5: Statistical Consulting.** Additional prerequisite: Coursework in mathematical statistics and regression.

**Topic 6: Survey Research Methods.**

**Topic 7: Forecasting.** Development of forecasting techniques for use in business applications. Additional prerequisite: Business Administration 386T or the equivalent.

**Topic 8: Cybernetics and the Law: Societal, Economic, and Other Problems.**

**Topic 9: Applied Linear Models.** Theory and application of linear models in empirically oriented research in business. Additional prerequisite: Business Administration 386T or the equivalent.

**Topic 10: Mathematical Statistics for Applications.** Introduction to the basic concepts of probability and mathematical statistics for doctoral degree students who plan to use statistical methods in their research but do not need a highly mathematical development of the subject. Topics include probability distributions and estimation theory and hypothesis testing techniques. Additional prerequisite: A calculus course covering integration and differentiation.

**Topic 11: Analysis of Variance.** Additional prerequisite: Business Administration 386T or the equivalent.

**Topic 12: Applied Multivariate Methods.** Additional prerequisite: Business Administration 386T or the equivalent, and familiarity with statistical software.

**Topic 13: Statistical Decision Theory.** Development of the mathematical basis of statistical decision theory from both the Bayesian and the frequentist point of view. Additional prerequisite: A calculus-level course in statistics.

**Topic 14: Risk Analysis and Management.** The quantification and analysis of risk, considered from several perspectives: financial risk measures, strategic risk measures, stochastic dominance rules, chance constrained programming, and safety-first approaches.

**Topic 15: Research on Probabilistic Judgment.** Research training and experience for graduate students and advanced Business Honors Program undergraduate students who are interested in probabilistic judgment. Additional prerequisite: Statistics 309H or the equivalent and consent of instructor.

**Topic 16: Probability and Science in the Courtroom.** The role of probability and scientific reasoning in legal judgments: differences between probability evidence and other types of evidence; legal and psychological implications of these differences; the role of statistics, formal analyses, and expert opinions in legal decisions; their impact on judges and jurors. Management Science 380 (Topic 20: Probability and Science in the Courtroom) and Statistics 380 (Topic 16) may not both be counted.

**Topic 17: Predictive Modeling.** Introduction to statistical methods for prediction including regression analysis, logistic and multinomial regression, classification and regression trees, bias-variance trade-off, cross validation, variable selection, principal component regression and partial least squares regression.

**Topic 18: Learning Structures and Time Series.** Introduction to exploring data analysis, clustering, dimension reduction, networks, text timing, and time series. Additional prerequisite: Consent of instructor.

### STA 381. Sampling.

Theory of sampling; sample design, including stratified, systematic, and multistage sampling; nonsampling errors. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Business Administration 386T.

### STA 184N, 284N, 384N. Topics in Business Analytics.

Restricted to students admitted to Master's of Science in Information, Risk, and Operations Management program. Selected topics in business analytics. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### STA 287, 387. Business Analytics and Decision Modeling.

Introduction to some of the basic concepts in quantitative business analysis that are used to support organizational decision making over various time frames. Explores methods that apply to all areas of an organization, with emphasis on financial decision making. For 287, four lecture hours a week for a half a semester; for 387, three lecture hours a week for one semester. Prerequisite: Graduate standing and admission to the McCombs School of Business.

## Legal Environment of Business

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## Legal Environment of Business: LEB

### LEB 180, 380. Topics in the Legal Environment of Business.

Selected topics on legal constraints affecting managerial decision making and business behavior. One or three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 2: Antitrust Law and Economics.** Legal regulation of anticompetitive market structures and business practices, including political, economic, and historical factors. Monopolies, mergers, horizontal and vertical restraints of trade, and price discrimination.

**Topic 3: Law of Commercial Real Estate Finance and Development.** The legal framework of commercial real estate finance and development, including basic real estate law concepts, legal aspects of financing techniques and instruments, subdivision land-use controls, environmental regulation of real estate development, and other topics.

**Topic 4: Law for Finance.** Covers all aspects of securities regulation, including the legal responsibilities and liabilities of investment bankers, stock analysts, hedge fund managers, auditors, and other securities industry professionals; corporate disclosure requirements; public offering rules; insider trading; mergers and acquisitions; shareholder rights; and relevant ethical and global implications.

**Topic 5: The Law and the Multinational Corporation.** Study of the legal environment in which the multinational enterprise operates, including negotiation and drafting of international contracts, international dispute resolution, expropriation, international investment regulation, letters of credit, tax havens, and cultural and ethical issues.

**Topic 6: Intellectual Property and Antitrust.** Relationships and tensions between laws designed to encourage competitive markets (antitrust laws) and those that grant limited monopolies (patents, copyrights, and trademarks).

**Topic 7: Corporation Law.** Legal framework for the formation and operation of partnerships and corporations, including limited liability partnerships and limited liability corporations; introduction to securities regulation concepts such as insider trading, mergers, and acquisitions.

**Topic 8: Legal Environment of Business.**

**Topic 9: Law of the Entertainment Business.** Legal aspects of management in the entertainment industry, including contractual and financing arrangements, licensing, and copyright.

**Topic 10: Law of Wills, Trusts, and Estates.** Planning and management of estates through the use of wills, trusts, and gifts; intestacy, guardianships, marital property systems, and prenuptial agreements.

**Topic 11: Environmental Dispute Resolution.** Theoretical and practical study of the prevention, management, and resolution of environmental disputes, such as those involving protection of endangered species, wetlands preservation, natural resource conservation, and liability for environmental damage and clean-up.

**Topic 12: Legal Regulation of Unfair Competition.** Competitive actions that violate state or federal law, such as intentional interference with the contractual relations of others, defamation in business contexts, and misappropriation of trade secrets. Ethical and international dimensions are included where appropriate.

**Topic 13: Commercial Transactions.** A comprehensive study of the legal framework for business transactions, including bailments, sales of goods, commercial paper, lender liability, bank-customer relationships, secured transactions, creditor rights, and bankruptcy.

**Topic 14: Intellectual Property.** Legal aspects of protecting intellectual property, including patents, trade secrets, trademarks, and copyrights; the contractual licensing of these property rights and other legal aspects of technology.

**Topic 16: Legal Aspects of Marketing.** State and federal laws on consumer protection, pricing (including price fixing and price discrimination), packaging, advertising, distribution, dealer control, and related topics. Ethical and international dimensions are included where appropriate.

**Topic 17: Legal and Ethical Environment of Accounting.** State and federal regulations and tort and contract law principles that constrain accountants and create potential liability. Ethical and international dimensions are included where appropriate. Legal Environment of Business 380 (Topic 1) and 380 (Topic 17) may not both be counted.

**Topic 18: Products Liability.** Public policy, economics, and legal rules regarding liability for the manufacture or sale of defective products. Ethical and international dimensions are included where appropriate.

**Topic 19: Employment Law.** State and federal laws on hiring, supervising, disciplining, and terminating employees: wrongful discharge law, discrimination law, workers' compensation and employee safety laws, and several related topics. Ethical and international dimensions are included where appropriate.

**Topic 20: Creating and Enforcing Contracts.** Legal rules and practical policies on creating, monitoring, and enforcing contractual rights in a wide variety of business settings. Ethical and international dimensions are included where appropriate.

**Topic 21: Environmental Issues in Real Estate Transactions.** Federal and state environmental regulations affecting commercial real estate transactions, including the Comprehensive Environmental Response, Compensation, and Liability ("Superfund") Act, the Clean

Water Act, the Endangered Species Act, wetlands regulation, and other related topics. Ethical and international dimensions are included where appropriate.

**Topic 22: Law of Corporate Finance and Governance.** Legal rules and regulations applicable to a broad range of corporate financial issues, including agency theory, limited liability, valuation, bondholder rights, dividend policy, accountant and investment banker liability, and capital structure and leverage. Ethical and international dimensions are included where appropriate.

**Topic 23: Law of Corporate Mergers and Takeovers.** Legal rules, policies, and economics of mergers, acquisitions, hostile takeovers, leveraged buyouts, and related topics. Ethical and international dimensions are included where appropriate.

**Topic 24: Law of Real Estate Finance.** Federal and state regulation of real estate finance. Topics include creation, transfer, and discharge of mortgagor's and mortgagee's interests; mortgage substitutes; foreclosures; priority of liens; bankruptcy; and government intervention in the private mortgage market. Ethical and international dimensions are included where appropriate.

**Topic 25: Bankruptcy Law and Debtor-Creditor Relations.** The legal framework governing the rights and duties of companies, and their owners, creditors, and other stakeholders, in times of severe financial distress. Includes liquidation and reorganization proceedings in bankruptcy as well as alternatives to bankruptcy. Ethical and international dimensions are included where appropriate.

**Topic 26: Law for Entrepreneurs.** Legal issues and principles affecting the business entrepreneur, including those related to formation of the appropriate type of business organization, capitalization, protection of personal assets from business liabilities, protection of innovative ideas, hiring key personnel, and related topics. Ethical and international dimensions are included where appropriate.

**Topic 27: Cyberlaw.** Highly focused coverage of intellectual property law (copyright, trade secret, patent, trademarks, and related topics) as it relates to computer hardware and software; substantial coverage of hardware and software licensing; Internet-related legal issues; antitrust issues in the computer industry; and other topics as time permits, such as encryption, privacy, and computer-system vendor liability.

**Topic 29: Business and Public Policy.** Study of the nonmarket environment and its considerable effects on business organizations. Review of business strategies for influencing legislatures, the executive branch, court decisions, and the media.

**Topic 30: Legal Environment of Business for MPA Students.** Introduction to the legal system, with particular emphasis on its applications to the accounting profession. Additional prerequisite: Admission to the Master in Professional Accounting program.

**Topic 31: Energy Law.** Introduction to the legal issues facing energy-generating and energy service companies in a deregulating, though not fully deregulated, world. Includes the (de)regulation of generation, wholesale transactions, and retail service, as well as the contractual and other legal issues governing the commercial market for energy.

**Topic 32: E-Commerce: Law, Policy, and Strategy.** The responsibilities of the strategist for choosing, developing, and managing an overall e-business firm strategy in uncertain legal, market, technology, and policy environments.

**Topic 33: The Legal Life Cycle of a Technology Start-up.** Comprehensive coverage of the legal issues faced by a technology start-up firm, including choice of an organizational form, employee compensation issues, negotiating real estate leases, protecting intellectual property, raising capital, and taking the firm public. Additional prerequisite: Admission to the Master of Business Administration program.

**Topic 37: Financial Crisis and Restructuring.** Studies the business and legal issues of corporate financial crises. Includes crisis simulation,

moot court participation, and guest lectures by restructuring and insolvency professionals.

### **LEB 280C. Legal Environment of Business.**

Two lecture hours a week for one semester. Prerequisite: Graduate standing.

## **Management**

*Master of Science in Management  
Doctor of Philosophy*

### **For More Information**

**Campus address:** College of Business Administration Building (CBA) 4.202, phone (512) 471-2622, fax (512) 471-3837; campus mail code: B6300

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Management, 2110 Speedway Stop B6300, Austin TX 78712

**E-mail:** Ethan.Burris@mcombs.utexas.edu

**URL:** <http://www.mcombs.utexas.edu/departments/management/phd>

### **Facilities for Graduate Work**

The physical facilities, computing systems, and research centers that support graduate work in the McCombs School are described in the Business Administration section under Facilities for Graduate Work (p. 41).

### **Areas of Study**

Students in the graduate program in management concentrate in either organization science or strategic management.

### **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Emily Amanatullah	David A Harrison
Caroline A Bartel	Andrew D Henderson
Y Sekou Bermiss	Luis D Martins
Ethan R Burris	Shefali V Patil
Johnny S Butler	Francisco Polidoro Jr
Janet M Dukerich	Ramkumar Ranganathan
James W Fredrickson	Violina P Rindova
Melissa E Graebner	Jennifer Whitson

### **Admission Requirements**

Admission to the program is very competitive. Decisions are based on the applicant's test scores, academic record, work experience, personal statement, and letters of recommendation.

Students must enter the program in a fall semester.

## **Degree Requirements**

### **Master of Science in Management**

The Master of Science in Management is offered only to students who are enrolled in the doctoral program in management. This degree is offered in three options: with thesis, with report, and without thesis or report. The thesis option requires at least thirty semester hours of credit; the report

option, at least thirty-three hours; and the option without thesis or report, at least thirty-six hours. All coursework must be logically related, and the student's entire program must be approved by the student's primary adviser and the graduate adviser. The Graduate Studies Committee's approval is not required.

## **Doctor of Philosophy**

All students take core and elective courses in the Department of Management that cover organization science, strategy, and research methods topics. Students must also complete at least two courses outside management.

A key objective in the student's development as a scholar is writing papers that will be published in top tier academic journals. Students will be required to write and present a sole-authored first-year conceptual paper. The quality of the student's work on the project is a factor in judging the student's progress in the degree program.

Students take the comprehensive examination, which assesses their knowledge of research methodology and of the field of management, at the end of the second year. They then undertake dissertation research as described in Degree Requirements (p. 20). A well-prepared student generally completes the degree in five years.

## **Graduate Courses**

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### **Management: MAN**

#### **MAN 283, 383. Current Issues in Organization Science.**

Restricted to graduate students in the McCombs School of Business. For 283, four lecture hours a week for half a semester; for 383, three lecture hours a week for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 16: Leading People and Organizations.** Designed to increase the student's effectiveness as a manager through discussion of organizational behavior and design, and guidelines for applying these concepts. Offered on the letter-grade basis only.

**Topic 20: Art and Science of Negotiation.** Offered on the letter-grade basis only. Additional prerequisite: Admission to the McCombs School of Business.

**Topic 22: Creating and Managing Human Capital.** Covers issues related to making human resource decisions in a more effective manner. Uses a strategic perspective, with particular emphasis on the links between human resource decisions and a firm's competitive position. Offered on the letter-grade basis only. Additional prerequisite: Admission to the McCombs School of Business.

**Topic 31: Organizational Change and Strategic Renewal.** Offered on the letter-grade basis only.

#### **MAN 285, 385. Current Issues in Strategic Management.**

Restricted to graduate students in the McCombs School of Business. For 285, four lecture hours a week for half a semester; for 385, three lecture hours a week for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 1: Action Skills for Managers: Implementing Strategy.**

Offered on the letter-grade basis only.

**Topic 2: The Art of Leadership.** Offered on the letter-grade basis only.

**Topic 6: Management Planning and Control in Complex Systems.** Offered on the letter-grade basis only.

**Topic 8: Managing Corporate Diversification and Renewal.** Offered on the letter-grade basis only.

**Topic 9: Strategic Analysis for High-Tech Industries.** Management 385 (Topic 9) and Management Information Systems 381N (Topic 3) may not both be counted. Offered on the letter-grade basis only.

**Topic 20: Advanced Venture Development.** Offered on the letter-grade basis only.

**Topic 22: New Venture Creation.** Offered on the letter-grade basis only.

**Topic 23: Introduction to Entrepreneurship.** Offered on the letter-grade basis only.

**Topic 24: Entrepreneurial Growth.** Offered on the letter-grade basis only.

**Topic 25: Social and Economic Aspects of Entrepreneurship.** Offered on the letter-grade basis only.

**Topic 33: Managing and Marketing in the Global Arena.** Offered on the letter-grade basis only.

**Topic 43: Facilitating Process Improvement.** Management X85 (Topic 43) is same as Civil Engineering 397 (Topic 15: Facilitating Process Improvement) and Mechanical Engineering 397 (Topic 3: Facilitating Process Improvement).

**Topic 49: Strategic Management.** Designed to help students develop a general management orientation. Subjects include the role of the general manager, formulating business and corporate-level strategy, managing strategic change, strategy implementation, and developing general managers. Business Administration 388T and Management 385 (Topic 49) may not both be counted. Offered on the letter-grade basis only.

**Topic 61: Perspectives on Public Policy.** Designed to prepare MBA students, both as individuals and in their professional careers as managers and leaders, for active and effective participation in the democratic process. Taught via video teleconferencing with instructors from the Washington campus. Offered on the letter-grade basis only.

**Topic 62: Corporate Governance.** Examines the roles and responsibilities of organizational leadership in a variety of settings, including large and small companies, startups and established companies, global, single-country, and single-region companies, and nonprofit entities. Offered on the letter-grade basis only.

**Topic 63: Economics of Competitive Strategy.** Develops and uses concepts from microeconomics, game theory, and the economics of industrial organization and applies these concepts to competitive decision making, using a combination of case analyses and lectures. Offered on the letter-grade basis only.

**Topic 64: Enterprise of Technology: From Mind to Market.** Focuses on moving an idea from the mind of the researcher to the marketplace by examining the activities involved in commercializing a technology from conception to profitable enterprise. Offered on the letter-grade basis only.

**Topic 65: Management Consulting Practicum.** Students work in supervised teams and develop recommendations to solve a real business problem for a client firm. Offered on the letter-grade basis only. Additional prerequisite: Consent of instructor.

**MAN 185C. Directed Studies in Global Management and Business Practices.**

Global business practices studied through lectures on campus and trips to international partner schools. One lecture hour a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

**MAN 285E, 385E. Directed Studies in Global Management and Business Practices.**

Global business practices studies through lectures on campus and trips to international partner schools. Two or three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

**MAN 185F. Leading for Impact.**

Analysis and application of contemporary concepts and theories of principled leadership for work teams and organizations. One lecture hour a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

**MAN 185G. Entrepreneurship and Innovation.**

One lecture hour a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate Standing.

**MAN 390. Seminar: Organization Science.**

Intensive analysis of organizational science issues. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Admission to the doctoral degree program and consent of instructor.

**Topic 1: Research in Organizational Science.** Offered on the credit/no credit basis only.

**Topic 2: Introduction to Research Methods in Management.**

**Topic 3: Research Methods in Management.**

**Topic 4: Seminar in Organizational Behavior.**

**Topic 5: Seminar in Organization Theory.**

**Topic 6: Organizational Decision Making.**

**Topic 9: Behavioral Decision Theory.**

**Topic 11: Management of Knowledge Workers.** The study of knowledge workers at four levels of analysis: as individuals, as team members, as organizational resources, and as national resources. Strong emphasis on theory building.

**MAN 393. Seminar: Strategic Management.**

Intensive analysis of strategic management issues. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Admission to the doctoral degree program and consent of instructor.

**Topic 1: Foundations of Strategic Management.**

**Topic 2: Contemporary Issues in Strategic Management.**

**Topic 3: Research in Strategic Management.** Offered on the credit/no credit basis only.

**Topic 5: Executive Leadership.**

**Topic 6: Management of Diversification.**

**MAN 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in management and consent of the supervising faculty member and the graduate adviser; for 698B, Management 698A.

**MAN 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, enrollment in the doctoral program in management, and consent of the supervising faculty member and graduate adviser.

## MAN 399R, 699R, 999R. Dissertation.

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and fulfillment of the language requirement for the doctoral degree.

## MAN 399W, 699W, 999W. Dissertation.

Offered on the credit/no credit basis only. Prerequisite: Management 399R, 699R, or 999R.

# Marketing

*Master of Science in Marketing  
Doctor of Philosophy*

## For More Information

**Campus address:** College of Business Administration Building (CBA) 7.202, phone (512) 471-1126, fax (512) 471-1034; campus mail code: B6700

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Marketing, 2110 Speedway Stop B6700, Austin TX 78712

**E-mail:** [mktphd@mcombs.utexas.edu](mailto:mktphd@mcombs.utexas.edu)

**URL:** <http://www.mcombs.utexas.edu/Departments/Marketing/Academic-Programs/PhD.aspx>

## Facilities for Graduate Work

The physical facilities, computing systems, and research centers that support graduate work in the McCombs School are described in the Business Administration section under Facilities for Graduate Work (p. 41). Of particular relevance to marketing students are the McCombs School Behavioral Research Laboratory and the Center for Customer Insight and Marketing Solutions, which works to develop pragmatic, market-relevant management knowledge, skills, and experience.

## Areas of Study

Graduate work in marketing is offered in the following areas: buyer behavior, marketing management, and quantitative methods.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Susan M Broniarczyk  
William H Cunningham  
Jade S Dekinder  
Jun A Duan  
Andrew D Gershoff  
Kate Gillespie  
Linda L Golden  
Ty Henderson  
Wayne D Hoyer

Julie R Irwin  
Vijay Mahajan  
Leigh M McAlister  
Robert A Peterson  
Rajagopal Raghunathan  
Raghunath S Rao  
Garrett P Sonnier  
Rajashri Srinivasan  
Frenkel Ter Hofstede

## Admission Requirements

Admission to the program is extremely competitive. Admission decisions are made by the Doctoral Admission Committee and are based on a balanced consideration of multiple factors, including academic credentials, test scores, work experience, personal statement, and letters of recommendation.

# Degree Requirements

## Master of Science in Marketing

The Master of Science in Marketing degree is offered only to students who are enrolled in the doctoral program in marketing. This degree is offered in three options: with thesis, with report, and without thesis or report. The thesis option requires at least thirty semester hours of credit; the report option, at least thirty-three hours; and the option without thesis or report, at least thirty-six hours. All coursework must be logically related, and the student's entire program must be approved by the graduate adviser.

## Doctor of Philosophy

To be admitted to candidacy for the doctoral degree, the student must (1) fulfill the core course requirements in marketing and research methods; (2) satisfy the first-year summer paper requirement; (3) complete course requirements in the area of specialization; (4) pass a written comprehensive exam by the end of the second year in the program; and (5) select a dissertation topic and dissertation committee. The student then submits a dissertation proposal for committee approval, conducts dissertation research, completes dissertation coursework, and defends the final dissertation research before the dissertation committee. A well-prepared student generally completes the program in four to five years.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## International Business: I B

### I B 191, 291, 391. Directed Studies in Global Management.

Global business practices studied through lectures on campus and trips to international partner schools. One and one-half lecture hours a week for one semester, and thirty hours of fieldwork abroad. Students may count more than three hours of credit only when the work is completed in different locations. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### I B 395. Seminar: International Trade.

Study of contemporary topics in international trade and investment theories, policies, and problems. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing; some topics also require consent of instructor.

**Topic 1: Global Strategic Management.** The changing global business environment and the ways multinational corporations compete in this environment. Case studies and readings, followed by a global management computer simulation.

**Topic 2: International Trade and Investment.** The basis for international trade, foreign exchange determination, balance of payments, and international trade and investment policy. Macro-level aspects of the international economy, which provide the basis for the functioning of the global economy.

**Topic 3: Global Business Operations.** Overview of management in a multinational context, focusing on the multinational corporation; the economic, political, and social environments in which it operates; and its basic managerial concerns with finance, management, marketing,

and personnel. Includes an international operations computer simulation.

**Topic 4: Business in Developing Countries.** The traditional challenges to business in developing countries and the new challenges of market liberalization. Similarities and differences among countries and regions.

**Topic 5: Business in Japan.** Comprehensive examination of macro-level and micro-level issues involved in conducting business in Japan and in competing with the Japanese in the global marketplace. Macro-level issues include government industrial policy, interfirm relationships, and United States-Japan trade relationships; micro-level issues include management style, foreign expansion strategy, research and development strategy, and distribution practices.

**Topic 6: International Marketing Management.** An overview of international marketing, with emphasis on the multinational corporation. Subjects include the changing international environment, researching and entering foreign markets, and the marketing mix in international marketing.

## Marketing: MKT

### MKT 282, 382. Analysis of Markets.

Introduction to the data and tools used to analyze the business environment and enable marketing decision making. Uses real world data and problems to evaluate strategic market opportunities and assess the impact of marketing decisions in the marketplace. Discusses analytical and empirical tools that address strategic issues of market sizing, market selection, and competitive analysis, as well as product management, customer management, and marketing function management decisions. For 282, four lecture hours a week for half a semester; for 382, three lecture hours a week for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

**Topic 1: Market Area Analysis.** Marketing X82 (Topic 1) is same as Geography 394C. Conceptual and methodological aspects of analyzing the geographical dimensions of demand. Students complete a field project in which they apply concepts and techniques to the analysis of a problem. Offered on the letter-grade basis only.

**Topic 2: Analytical Methods in Marketing.** Basic analytical techniques that are used to improve market-oriented decisions: brand-switching, linear programming applications in advertising, competitive bidding, distribution and location models, conjoint measurement, and multivariate data analysis for strategy formulation. The course stresses the use of the models to deal with marketing variables and problems and the acquisition of relevant data. Case analyses and projects. Offered on the letter-grade basis only.

**Topic 3: Business and Public Policy.** Provides a historical framework in which to study key issues in contemporary government and business relations in the United States and, to a limited extent, in other countries. Settings range from the Depression and the New Deal to more recent periods of social regulation of business; topics range from the role of the international oil companies to the deregulation of the airlines. Offered on the letter-grade basis only.

**Topic 4: Strategic Marketing.** Strategic marketing decisions made at the corporate and business-unit levels, and organizational issues that affect the formulation and implementation of marketing strategy; an experiential course, taught primarily through the case method and a marketing strategy computer simulation game. Offered on the letter-grade basis only.

**Topic 5: Current Topics in Consumer Marketing.** Reasons for the shift in allocation from advertising to promotion, and implications of this shift for the structure of packaged-goods marketing. Offered on the letter-grade basis only.

**Topic 6: Buyer Behavior in Global Markets.** The application of marketing strategy and buyer behavior principles in the global environment. Offered on the letter-grade basis only.

**Topic 7: Industrial Marketing.** Concepts, theories, and models from industrial marketing strategy provide the foundation for case analyses of a variety of technology-intensive firms, primarily in electronics, data processing, and pharmaceuticals. Offered on the letter-grade basis only.

**Topic 8: Product Policy and Tactics.** Tactical and strategic product decisions, with emphasis on the former. Consumer goods, with some attention to the marketing needs of industrial products and service industries; decisions about a firm's product portfolio. Uses case analyses and personal computer-oriented analytical exercises. Offered on the letter-grade basis only. Additional prerequisite: Completion of Master of Business Administration core courses.

**Topic 9: Marketing Strategy for Small Business.** Basics of marketing strategy and marketing plan development; students develop such a plan for a beginning business. Offered on the letter-grade basis only.

**Topic 11: Quality and Competitiveness.** The globalization of competition, the challenge to the United States position in the world economy, and the total quality management movement as a competitive response. Offered on the letter-grade basis only.

**Topic 12: Customer Strategy.** External resources for competitiveness, such as customer relationships that can help deliver superior quality and drive down costs. The course brings together experienced managers and students who have interned with them to explore issues underlying total quality in marketing. Offered on the letter-grade basis only. Additional prerequisite: Completion of an instructor-approved internship.

**Topic 13: Pricing and Distribution Channel Strategies.** Analysis of distribution and pricing decisions, factors that influence these decisions, and the role of pricing and distribution in the formulation of marketing strategy. Lecture/discussions, cases, and group projects. Offered on the letter-grade basis only.

**Topic 14: Marketing of Services.** Organizations that market services rather than goods; differences between tangible goods and services; unique service-marketing problems and opportunities. Offered on the letter-grade basis only.

**Topic 15: Marketing High-Tech Products.** The forces driving competition in industrial markets, with emphasis on technological products. This course focuses on honing students' analytical skills for leveraging marketing decision making. Offered on the letter-grade basis only.

**Topic 16: Project Management in Fast-Cycle Environments.** Offered on the letter-grade basis only.

**Topic 17: Business Data Analysis With Data Mining.** Restricted to Red McCombs School of Business graduate students. The equivalent of two or three lecture hours a week for one semester. Offered on the letter-grade basis only.

**Topic 18: Leveraging Marketing Metrics.** Examines the link between marketing decisions and financial performance. Offered on the letter-grade basis only. Additional prerequisite: Admission to the McCombs School of Business.

### MKT 383. Acquisition, Consumption, and Disposition Behavior.

The acquisition, consumption, and disposition of goods, services, time, and ideas by individuals, families, and organizations, examined from a managerial viewpoint. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### MKT 384. Marketing Research Methodology.

An applied approach to advanced marketing research, covering both the design and execution of marketing research projects and the



management of the marketing research function. Three lecture hours a week for one semester. Prerequisite: Graduate standing, three semester hours of coursework in marketing, and three semester hours of coursework in statistics.

### **MKT 386. Advanced Marketing Management.**

Major marketing concepts and variables, their interrelationships, and their implications for policymaking, problem solving, and strategy formulation. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **MKT 397. Seminar: Current Topics in Marketing.**

Survey and analysis of current marketing problems; their significance, evaluation, and probable outcome. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

#### **Topic 1: Marketing Theory and Development of Marketing**

**Thought.** Analysis of marketing phenomena and their causes.

Provides a historical framework to study issues among key components of the marketing system (customers, distributors, and manufacturers).

**Topic 2: Marketing Management and Strategy.** Examination from the marketing perspective of the process of strategy development and implementation at various levels of the organization: corporate, strategic business unit, and product line/brand.

**Topic 3: Buyer Behavior.** Theoretical examination of the acquisition and consumption of goods, services, time, and ideas by individuals and groups.

**Topic 4: Marketing Research Methods.** Advanced statistical procedures and analytical methods for data analysis; reliability and validity of data.

**Topic 5: Research Topics in Marketing.** Current research issues, methods, and models in marketing; focus on both theory and methodology.

**Topic 6: Advanced Research Methods in Marketing.** New methodological developments and research procedures; selected topics.

**Topic 7: Marketing Models.** Analytical techniques and models developed by management scientists to aid marketing-oriented decisions in contexts such as marketing mix management, new product development, and product adoptions.

**Topic 8: Quantitative Marketing Strategy.** Decision models and analytical procedures used in strategic decision making in marketing; strategic planning approaches, industry analysis (models related to growth in sales and competition), competitive structure (approaches for market structure analysis), and new product design and development models.

**Topic 9: Behavioral Decision Research.**

**Topic 10: Marketing Models II.** Restricted to doctoral students in McCombs School of Business. Introduces state-of-the-art theoretical and empirical marketing models using deductive mathematical analysis and inductive statistical reasoning. Create novel quantitative marketing models and estimation methods and critically evaluate the models in the literature of quantitative marketing. Three lecture hours a week for one semester.

### **MKT 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in marketing and consent of the graduate adviser; for 698B, Marketing 698A.

### **MKT 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in marketing and consent of the supervising faculty member.

### **MKT 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **MKT 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Marketing 399R, 699R, or 999R.

## **Technology Commercialization**

*Master of Science in Technology Commercialization*

### **For More Information**

**Campus address:** Graduate School Building (GSB) 5.126A, phone (512) 471-4700, fax (512) 471-4131; campus mail code: B6300

**Mailing address:** The University of Texas at Austin, MSTC Program, Red McCombs School of Business, 2110 Speedway Stop B6300, Austin TX 78712

**E-mail:** [mstc@mcombs.utexas.edu](mailto:mstc@mcombs.utexas.edu)

**URL:** <http://www.mcombs.utexas.edu/mstc/>

The project-based Master of Science in Technology Commercialization (MSTC) at the McCombs School of Business focuses not only on general management knowledge and business skills but also on technology entrepreneurship, venture creation, and commercialization. The program is designed to give students the expertise necessary to convert scientific knowledge and technology to wealth by creating new products, services, and ventures. Students in the program study all aspects of starting and managing entrepreneurial and intrapreneurial ventures, assessing a technology's commercial potential, and accelerating the movement of products and services from conception to market introduction and growth.

The one-year executive program provides graduate education for professionals while they continue their careers. Classes meet on alternate weekends, Friday evenings and all day Saturday, for twenty-three weekends. The program begins with the MSTC Launch Week in Austin, Texas, in late April/early May. Another intensive week in August jump-starts the fall semester. The fall semester concludes with a required international trip. The MSTC program is offered both on campus and online. The coursework is rigorous and demanding, requiring a serious commitment on the part of the student.

### **Areas of Study**

The master's degree addresses challenges in both technology policy and technology enterprise.

### **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Emily Amanatullah  
Edward G Anderson Jr  
Caroline A Bartel  
Y Sekou Bermiss  
Ethan R Burris  
Johnny S Butler  
John A Daly  
Janet M Dukerich  
James S Dyer  
James W Fredrickson

Melissa E Graebner  
David A Harrison  
Andrew D Henderson  
Ross G Jennings  
Luis D Martins  
Steven P Nichols  
Francisco Polidoro Jr  
Ramkumar Ranganathan  
Violina P Rindova  
Jennifer Whitson

Saturdays. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the technology commercialization program.

### **STC 385. Creative and Innovative Management.**

Concepts, ideas, initiatives, and methods used to give an organization a new direction or mode of operation; implementation of new ideas; successful moves in new directions. Meets all day on alternate Fridays and Saturdays. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the technology commercialization program.

### **STC 386. Topics in Technology Commercialization.**

The process of technology commercialization, managing technology, and other topics that include the commercialization of technology. Meets all day on alternate Fridays and Saturdays. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the technology commercialization program.

**Topic 1: Financing New Ventures.** Methods for determining capital requirements and ways of crafting financial and fund-raising strategies. Forms of financing, including angels and informal investors, venture capital, debt capital, and inside and outside equity. Offered on the letter-grade basis only.

**Topic 2: Managing Technology and Business Risks.** Risk analysis and strategies for the creation, implementation, and management of technology enterprises. Introduction to decision and risk analysis, methods for structuring and modeling decision problems, and application of methods to problems that involve risk and uncertainty in the commercialization of new technologies. Offered on the letter-grade basis only.

### **STC 389. Problems in Specialized Fields.**

Independent study. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the technology commercialization program.

### **STC 390. Government Policies: Science and Technology Commercialization.**

How government policies affect research and development and commercialization; how organizations can influence these policies, maximize their usefulness, or minimize their interference with the ability to commercialize technology. Meets all day on alternate Fridays and Saturdays. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the technology commercialization program.

### **STC 391. Technology Transfer in the Global Economy.**

Technology transfer theories, concepts, and implementation techniques essential to successful commercialization efforts. Global commercialization efforts and processes for brokering technology internationally. Meets all day on alternate Fridays and Saturdays. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the technology commercialization program.

### **STC 393. Conference Course in Science and Technology Commercialization.**

Individual study in selected aspects of the commercialization of technology. Conference course. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, admission to the technology commercialization program, and consent of the graduate adviser.

### **STC 394C. Managing Product Development and Production.**

The current methods and best practices used by organizations to accelerate the product development process. Meets all day on

## **Admission Requirements**

The prospective student should have at least five years of professional experience, an above-average score on the Graduate Record Examination General Test (GRE) or the Graduate Management Admission Test (GMAT), and an undergraduate grade point average of at least 3.00.

The Admissions Committee may consider waiving the GMAT/GRE requirement in the MSTC program when one of the following conditions is met: (1) fifteen years of people/project management experience, (2) an advanced degree, or (3) an expired GMAT.

## **Degree Requirements**

The program requires thirty semester hours of graduate coursework. Students must enter the program in the summer and must take courses in a prescribed sequence. There are no electives.

## **Graduate Courses**

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## **Science and Technology Commercialization: STC**

### **STC 380. Converting Technology to Wealth.**

The process of commercialization through which knowledge (ideas, innovations, science, technology, talent, and expertise) is converted to wealth. The importance of technology innovation and commercialization to the economy of a country. Students perform a technology assessment. Meets all day on alternate Fridays and Saturdays. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the technology commercialization program.

### **STC 382. Marketing Technological Innovations.**

Marketing and persuasion in the process of taking a technology from idea to market. Examines marshaling support for technology development, matching technologies with market needs, and launching a product. Students develop a proposal and a marketing plan for taking a product to market. Meets all day on alternate Fridays and Saturdays. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the technology commercialization program.

### **STC 384. Commercialization Strategy.**

Technology strategy as part of business strategy. The use of models and other concepts to measure the effectiveness of commercialization; the analysis and measurement of risk. Meets all day on alternate Fridays and

alternate Fridays and Saturdays. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the technology commercialization program.

### **STC 395. New Venture Creation.**

Explores the process of creating new ventures. Includes the dynamics of growth-oriented firms, the roles of entrepreneur and intrapreneur in organizational environments, factors that drive the creative process, and the importance of entrepreneurship to the economy. Students develop a detailed, growth-oriented business plan for an enterprise or project based on a specific technology of their choice. Meets all day on alternate Fridays and Saturdays. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the technology commercialization program.

### **STC 396. New Venture Design and Implementation.**

Explores business plan evaluation and implementation. Students develop an operational plan on how to launch a technology-based venture. Meets all day on alternate Fridays and Saturdays. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the technology commercialization program.

## **College of Communication Communication**

*Master of Arts  
Master of Fine Arts  
Doctor of Audiology  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Belo Center for New Media (BMC) 5.312, phone (512) 471-5775, fax (512) 471-8500; campus mail code: A0900

**Mailing address:** The University of Texas at Austin, Office of the Dean, College of Communication,  
1 University Station A0900, Austin TX 78712

**URL:** <http://communication.utexas.edu/>

### **Facilities for Graduate Work**

In addition to the extensive library and computer resources of the University, certain special resources provide support for graduate work in communication. The Belo Center for New Media is the college's new five-story, 120,000 square-foot building. It provides interactive classrooms and meeting space for students and houses the adjacent KUT Public Media Studios. It is a state-of-the-art facility that includes a 300-seat auditorium, a multimedia newsroom, an advertising creative room, and dedicated spaces for conferences, presentations, and screenings.

Communication Building A (CMA) is a six-level building housing classrooms, offices, and sophisticated multimedia facilities.

Communication Building B (CMB), a nine-level production building and houses Austin's public television station, KLRU. Also housed in CMB are teaching and production facilities for the School of Journalism and the Department of Radio-Television-Film. The extensive Behavioral Science Laboratory in CMB is a research facility housing a suite of versatile, state-of-the-art experimental rooms and laboratory spaces.

These facilities provide opportunities for programs of graduate study that cross departmental lines and media, and that combine the resources of the College of Communication in other ways not feasible within a single

department. Additional facilities are listed in each graduate program's section.

## **Areas of Study**

Graduate work in the College of Communication may lead to the Master of Arts, the Master of Fine Arts, the Doctor of Audiology, or the Doctor of Philosophy, or may be taken as a supporting field for a graduate degree in an area outside the college. For the Master of Arts or Doctor of Philosophy, the student may major in advertising, communication sciences and disorders, communication studies, journalism, or radio-television-film; radio-television-film majors may seek the Master of Fine Arts in production; communication sciences and disorders majors may seek the Doctor of Audiology degree. Advanced graduate work in communication may emphasize the processes of communication, or interdisciplinary combinations of areas of study, or appropriate subdivisions indicated by the courses taught and the specialties of faculty members.

## **Admission Requirements**

The applicant must have an undergraduate degree from an accredited college or university and may be required to complete up to twelve semester hours of upper-division coursework in the area of the proposed graduate major. Each program reserves the right to examine the applicant orally or in writing or both regarding the subject matter prerequisite to graduate courses in the major.

## **Degree Requirements**

### **Master of Arts**

The Master of Arts usually requires thirty semester hours of graduate coursework, although additional courses may be required to make up deficiencies.

### **Master of Fine Arts**

The Master of Fine Arts is available only in video and film production or in writing for film and television. Information about the program is given in the Radio-Television-Film (p. 82) section.

### **Doctor of Philosophy**

The doctoral program cannot be defined in terms of a specific number of hours of credit, although a few core requirements may be stated. Beyond these core courses, the student is required to select a major area of study, to take courses recommended by an advisory committee in this area, and to pursue coursework in one or more supporting fields. The graduate programs in the college work closely together in the coordination of courses for the doctoral degrees in communication. Supporting fields are most commonly in the social and behavioral sciences, business, education, and linguistics, but the student may suggest other fields.

Core requirements include graduate courses in communication theory and research methodology specified by the departments. Foreign language or substitute research tool requirements are specified by Graduate Studies Committees. Students should consult the program's graduate adviser for specific requirements.

### **Doctor of Audiology**

The college offers the Doctor of Audiology (AuD) through the Department of Communication Sciences and Disorders. Information about the program is given in Communication Studies Degree Requirements (p. 70).

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Communication: COM

#### COM 281, 381. Seminar in Communication.

Communication in a pluralistic society; nature of theory development; state of communication theory; conceptual models; sources of communication theory: semantic, linguistic, perceptual, sociological; information theory. Two or three lecture hours a week for one semester. Communication 281 is offered on the credit/no credit basis only. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: For 281, graduate standing; for 381, graduate standing and at least twelve semester hours of upper-division coursework in the major.

#### COM 398T. Supervised Teaching in Communication.

Required for assistant instructors. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

## Advertising

*Master of Arts  
Doctor of Philosophy*

### For More Information

**Campus address:** Belo Center for New Media (BMC) 4.338, phone (512) 471-1101, fax (512) 471-7018; campus mail code: A1200

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Advertising, 1 University Station A1200, Austin TX 78712

**E-mail:** [gradvertising@austin.utexas.edu](mailto:gradvertising@austin.utexas.edu)

**URL:** <http://advertising.utexas.edu/>

### Facilities for Graduate Work

In addition to the extensive library and computer resources available on the campus, certain special resources provide support for graduate work in advertising.

Classrooms and laboratories devoted to research and creative work in advertising include a copy and layout studio equipped with the latest computer technology for advertising design and production; the Advertising Library, containing Clío award-winning commercials from 1960 to the present and creative advertising texts and periodicals; the Advertising Conference Room, equipped for client and research presentations; and the Enviro Media Student Lounge.

### Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Ronald B Anderson  
Lucinda Jane Atkinson  
Neal M Burns  
Vincent Joseph Cicchirillo  
Angeline Grace Close  
Isabella C Cunningham  
Minette E Drumwright  
Anthony David Dudo  
Matthew Eastin  
Lee Ann Kahlor

Wei-Na Lee  
Robert Joel Lewis  
Brad Love  
Michael S Mackert  
Carlos H Mireles  
John H Murphy  
Kathrynn Pounders  
Patricia A Stout  
Kevin D Thomas  
Gary B Wilcox

### Admission Requirements

The entering student must hold a bachelor's degree from an accredited institution. All students must complete the following coursework prior to the first semester of enrollment: a basic marketing course and a basic statistics course.

### Degree Requirements

The Master of Arts degree is offered in two options: with thesis and without thesis. The thesis option requires at least thirty-six semester hours of credit; the option without thesis, at least thirty-nine hours. Advertising 380J, 382J, 385, 387, 388K, and 391K are required. All students must also complete at least six semester hours in a minor area of study, such as marketing, sociology, anthropology, journalism, psychology, or English. No more than six semester hours of upper-division coursework may be counted toward the degree. These courses must be approved by the graduate adviser.

The program is flexible, allowing students to focus on their specific interests through elective and minor coursework. Most students complete the program in twenty-one months.

**Option II.** The Master of Arts is offered both in a traditional format and in the Option II format. Option II provides a planned program of study that includes intensive summer work and special internationally focused enrichment opportunities. It gives students enrolled in participating academic programs access to a multinational and global experience. Option II students must complete a master's report.

### Dual Degree Programs

The Department of Advertising offers the following dual degree programs in cooperation with other divisions of the University. More information is available from the graduate adviser in each program.

Field	Degree(s)
Business administration	Master of Business Administration
Public affairs	Master of Public Affairs

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## Advertising: ADV

### ADV 380J. Quantitative and Qualitative Research.

An introduction to advertising research designs and procedures. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### ADV 381. Consumer Behavior.

An interdisciplinary study using behavioral science concepts to explain consumer motivation, information processing, and consumption behavior; sociological and psychological factors affecting the consumption process and the marketing/advertising of goods and services. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Advertising 380J.

### ADV 382J. Theories of Persuasive Communication and Consumer Decision Making.

Communication and behavioral science theories as they relate to contemporary advertising practices. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### ADV 483. Supervised Individual Creative Studies.

Conference course. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and written consent of instructor received prior to registering.

**Topic 1: Art Directors' Seminar.**

**Topic 2: Portfolio I.**

**Topic 3: Portfolio II.**

**Topic 4: Portfolio III.**

**Topic 5: Portfolio IV.**

### ADV 385. International Advertising.

Study of the managerial, economic, legal, and cultural aspects of multinational advertising. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Strategic Advertising Principles.**

**Topic 2: Account Planning.**

**Topic 3: Media Management.**

**Topic 4: Strategic Advertising Management.**

**Topic 5: Multicultural Advertising: Theory and Research.**

### ADV 387. Creative Strategies.

The process of developing creative concepts and their effective execution. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### ADV 388C. Research Problems: Doctoral Examination Preparation.

Research and reading in preparation for doctoral examinations. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of graduate adviser.

### ADV 388J. Principles of Advertising Management.

The study of planning, organization, and control of the advertising functions. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Advertising 370J or the equivalent, and consent of the graduate adviser.

### ADV 388K. Integrated Communications Management.

The application of management principles to the solution of integrated communications management problems. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### ADV 189, 389, 489. Problems in Specialized Fields of Advertising.

Research project chosen from the area of the student's major interest; a written report or creative project is required. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Students who take Advertising 189 must register for a topic of 189 for three consecutive semesters. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, consent of instructor, and written consent of the graduate adviser received prior to registering.

**Topic 1: Computer Graphics--Creative Sequence.**

### ADV 391K. Seminar in Advertising.

Survey and analysis of current advertising issues and practices. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Interactive Advertising.**

**Topic 2: Advanced Account Planning.**

**Topic 4: Audiences for Nonprofit Organizations.**

**Topic 5: Integrated Communication for Sports.**

**Topic 6: Media Research.**

**Topic 7: Public Relations Theory.**

**Topic 8: Quantitative Models in Advertising.**

**Topic 10: Business to Business Integrated Communication Management.** Cases and problems dealing with the management of business to business integrated communication, advertising and promotional programs; media and creative strategies; consumer, retail, industrial, and public service applications.

### ADV 392. Issues in Advertising Theory and Research.

Examination of important current areas in advertising research and theory. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Admission to a doctoral program and consent of the graduate adviser.

**Topic 2: Advanced Advertising Theories I.**

**Topic 3: Advertising Research I.**

**Topic 4: Advanced Advertising Theories II.**

**Topic 5: Advertising Research II.**

### ADV 395. Advertising Internship.

Practical work experience in advertising sales, creative management, and research with advertisers, agencies, media, or auxiliary services. Offered on the credit/no credit basis only. Prerequisite: Graduate standing; Advertising 380, 385, and 387 with a grade of at least B in each; and a University grade point average of at least 3.00.

### ADV 698. Thesis.

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in advertising and written consent of the supervising faculty member and the graduate adviser received prior to registering; for 698B, Advertising 698A and written consent of the supervising faculty member and the graduate adviser received prior to registering.

### ADV 398R. Master's Report.

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite:

Graduate standing in advertising and written consent of the supervising faculty member and the graduate adviser received prior to registering.

### **ADV 398T. Student Teaching in Advertising.**

Restricted to doctoral students. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **ADV 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and written consent of the graduate adviser received prior to registering.

### **ADV 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Advertising 399R, 699R, or 999R, and written consent of the graduate adviser received prior to registering.

## **Communication Sciences and Disorders**

*Master of Arts  
Doctor of Audiology  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Jesse H. Jones Communication Center (Academic) (CMA) A4.134, phone (512) 471-2385, fax (512) 471-2957; campus mail code: A1100

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Communication Sciences and Disorders, 2504 Whitis Avenue A1100, Austin TX 78712-1074

**E-mail:** [csdgrad@austin.utexas.edu](mailto:csdgrad@austin.utexas.edu)

**URL:** <http://csd.utexas.edu/graduate/>

### **Facilities for Graduate Work**

Facilities include state-of-the-art laboratories in all major research areas in communication sciences and disorders. Two audio laboratories in the College of Communication Instructional Media Center are also available. The Speech and Hearing Center of the College of Communication provides a comprehensive facility for clinical training and research. Additional facilities include Information Technology Services and state and community institutions and agencies.

### **Areas of Study**

The graduate degree program in communication sciences and disorders provides training in speech/language pathology, audiology, deafness studies/education of the deaf, and speech and hearing science.

### **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Lisa M Bedore  
Mark E Bernstein  
Amy Elizabeth Booth  
James Booth  
Courtney T Byrd  
Craig A Champlin  
Bharath Chandrasekaran  
Barbara L Davis

Maya L Henry  
Su-Hyun Jin  
Chang Liu  
Thomas P Marquardt  
Elizabeth D Pena  
Li Sheng  
Harvey M Sussman

## **Admission Requirements**

Applicants to the program must meet the requirements for admission to the Graduate School given in Admission and Registration (p. 16); however, satisfying these minimum requirements does not guarantee admission. Each applicant's credentials are scrutinized by members of the faculty of the program. No single criterion, such as grade point average or Graduate Record Examinations (GRE) score, is given undue weight in the decision process; every attempt is made to assess the special strengths that the applicant might bring to the program.

## **Degree Requirements**

Students seeking professional certification in speech/language pathology or audiology must meet coursework and clinical requirements specific to the specialization or area of study. Information about certification requirements is available from the graduate adviser.

To be counted toward the degree, all coursework in the major must be at the graduate level. Individual study programs must be arranged in consultation with the graduate adviser.

### **Master of Arts**

All students must complete at least thirty semester hours in core courses, six hours of electives (including courses taken either within the department or outside the department), and either a master's report (three hours) or thesis (six hours) for a total of thirty-nine or forty-two hours of academic coursework. In addition, students must enroll in clinical practicum training in order to earn certification with the American Speech-Language-Hearing Association. Additional information regarding degree requirements is available on the department Web site (<http://csd.utexas.edu/graduate/masters-program>).

The Master of Arts provides graduate training in the following specializations.

**Speech/Language Pathology.** Students in speech/language pathology complete a set of core courses and clinical practicum experiences. Students may also choose from a set of electives based upon their specific interests.

**Audiology.** All students in audiology complete the same set of core courses and basic clinical practicum. Students may choose from a set of electives based upon their specific interests. The program of study is not designed to lead to professional certification. Students who are interested in professional certification in audiology should consider the Doctor of Audiology degree described below.

**Deafness Studies/Education of the Deaf.** The specialization in deafness studies/education of the deaf is inactive. Current information about its status is available from the graduate adviser.

**Speech and Hearing Science.** Students in speech and hearing science follow a broad, research-oriented program of study that is not designed to lead to professional certification. Additional information is available from the graduate adviser.

## Doctor of Audiology

The Doctor of Audiology (AuD) provides academic and clinical education for those who plan to enter the profession of audiology. The degree program involves preparation for the diagnosis and nonmedical treatment of hearing and balance disorders; it is designed to prepare audiologists to meet the standards for Texas state licensure in audiology.

The program requires a minimum of eighty-three semester hours of coursework and is designed to be completed in four years. All preprofessional students in audiology complete the same set of core courses and basic clinical practicum. Students may choose from a set of electives based upon their specific interests. Research experiences are part of the curriculum, but a dissertation is not required.

## Doctor of Philosophy

The Doctor of Philosophy is a research degree; students can expect opportunities to work closely with the faculty on research and to participate in the publication of research findings. All students in this program are expected to achieve mastery of research design principles and methods appropriate to their program of study.

## Graduate Courses

Professional liability insurance is required of all students enrolled in off-campus clinical practicums in speech/language pathology or audiology. The insurance policy must cover the duration of the placement, beginning on or before the first day of the placement and extending through the final day of the placement.

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Communication Sciences and Disorders: CSD

#### **CSD 180E, 280E, 380E, 480E. Conference Course in Communication Sciences and Disorders.**

Readings in the literature of communication sciences and disorders designed to expand the graduate student's opportunity for individual consultation both in research and in informational aspects of the work. One, two, three, or four conference hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing.

#### **CSD 181L, 281L, 381L. Clinical Practicum.**

Supervised practicum in speech/language pathology or audiology. Two, four, or six clinical teaching hours and one, two, or three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Admission to the graduate program in speech/language pathology or audiology.

#### **CSD 383N. Seminar in Human Communication Development.**

Strategies for original research in developmental sequences of communication behaviors and for research in classroom applications; representative topics include linguistic behaviors, oral language development, and second language instruction. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### **CSD 185C, 285C, 385C. Clinical Practicum in Pediatric Speech/Language Pathology.**

For 185C, one lecture hour and two practicum hours a week for one semester; for 285C, one lecture hour and five practicum hours a week for one semester; for 385C, one lecture hour and eight practicum hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing, Communication Sciences and Disorders 367K, or registration for Communication Sciences and Disorders 393D (Topic 2: Developmental Speech Disorders) or 393D (Topic 5: Developmental Language Disorders).

#### **CSD 185D, 285D, 385D. Clinical Practicum in Adult Speech/Language Pathology.**

Restricted to master's students in speech/language pathology. Practicum in the prevention and treatment of speech and/or language disorders in adults. For 185D, one lecture hour and three practicum hours a week for one semester; for 285D, one lecture hour and six practicum hours a week for one semester; for 385D, one lecture hour and nine practicum hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing; Communication Sciences and Disorders 371, or registration for Communication Sciences and Disorders 393E (Topic 3: Acquired Language Disorders) or 393F (Topic 2: Acquired Speech Disorders); and at least three semester hours of graduate coursework in adult speech/language pathology.

#### **CSD 185H, 285H, 385H. Clinical Practicum in Audiology.**

Restricted to doctoral students in audiology. Practicum in prevention, assessment, and intervention in hearing disorders. For 185H, one lecture hour and three practicum hours a week for one semester; for 285H, one lecture hour and six practicum hours a week for one semester; for 385H, one lecture hour and nine practicum hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and credit or registration for Communication Sciences and Disorders 378.

#### **CSD 286D. Assessment of Speech and Language Disorders.**

Restricted to master's students in speech/language pathology. Differential diagnosis and assessment of communication disorders. Two lecture hours and six practicum hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing, Communication Sciences and Disorders 285C and 285D, and one hundred clinical clock hours. At least two semester hours of coursework in assessment in speech language pathology are recommended.

#### **CSD 386N. Research in Communication Sciences and Disorders.**

Strategies and methodology in the design and analysis of research in communication sciences and disorders. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### **CSD 287E. Speech/Language Pathology Externship.**

Restricted to master's students in speech/language pathology. Field placement in speech/language pathology. The equivalent of one lecture hour and twenty-four practicum hours a week for one semester, with additional hours to be arranged. May be repeated for credit. Prerequisite: Graduate standing, Communication Sciences and Disorders 285C and 285D, and one hundred clinical clock hours.

#### **CSD 187H, 287H, 387H. Clinical Practicum in Audiology.**

Restricted to doctoral students in audiology. Practicum in prevention, assessment, and intervention in hearing disorders. For 187H, one lecture hour and three practicum hours a week for one semester; for 287H, one lecture hour and six practicum hours a week for one semester; for 387H, one lecture hour and nine practicum hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing; Communication

Sciences and Disorders 185H, 285H, or 385H; and one hundred clinical clock hours.

### **CSD 190J, 390J. Business Applications.**

Issues associated with the development, operation, and management of businesses devoted to service delivery in audiology and speech-language pathology. For each hour of credit earned, one lecture hour a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **CSD 391P. Anatomy and Physiology of the Auditory System.**

Topics associated with the structure and function of the auditory system, including hearing and balance mechanisms. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **CSD 392S. Speech Perception: Theories and Clinical Aspects.**

Overview of theories and research findings related to human speech perception and recognition. Topics include acoustic characteristics of speech categorical perception, infant speech perception, and effects of hearing loss. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **CSD 392U. Counseling in Audiology.**

Addresses audiologist counseling roles when working with hearing impaired individuals and their families. Includes both classroom and laboratory activities designed to further enhance the subjects presented. Two lecture hours a week and one-and-one-half laboratory hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **CSD 293D, 393D. Evaluation and Remediation in Speech/Language Pathology.**

Core courses for clinical competence in speech/language pathology. Two or three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Voice Disorders.**

**Topic 2: Developmental Speech Disorders.**

**Topic 3: Fluency Disorders.**

**Topic 4: Language Intervention with Infants and Toddlers.**

**Topic 5: Developmental Language Disorders.**

**Topic 6: Language Intervention with School-Age Children.**

### **CSD 293E, 393E. Topics Cognate to Speech/Language Pathology.**

New developments in related areas and their applications to speech/language pathology. Topics include infants and young children, clinical instrumentation, neuroanatomy, genetic considerations in speech/language pathology, prosody. Two or three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Dysphagia.**

**Topic 2: Measurement in Communication Sciences and Disorders.**

**Topic 3: Acquired Cognitive Communication Disorders.**

**Topic 4: Collaborative Models of Assessment and Intervention for Bilingual Children.**

**Topic 6: Language Theory and Bilingualism.**

**Topic 7: Cognitive and Linguistic Foundations of Language Development and Disorders.** Presents a framework for understanding the cognitive and linguistic mechanisms that underlie language development and disorders. Includes linguistic and psycholinguistic theories of language development.

**Topic 8: Anatomy and Physiology of the Speech and Hearing Mechanism.** In-depth study of the anatomy and physiology of

structures involved in speech, language, hearing, and swallowing. Includes anatomical and physiological mechanisms of respiration, phonation, articulation and hearing; and the central nervous system and blood supply to the speech and hearing mechanism. Communication Sciences and Disorders 358, and 393E (Topic 8) may not both be counted.

### **CSD 293F, 393F. Recent Developments in Speech/Language Pathology.**

Current developments in selected categories of speech and language disorders; designed to provide depth in one or more areas. Two or three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Aphasia.**

**Topic 2: Acquired Speech Disorders.**

**Topic 3: Team Management of Craniofacial Patients.**

### **CSD 393G. Measurement and Bias in Communication Sciences and Disorders.**

Selected topics in speech/language pathology, including pronunciation problems in second language learning, remedial programs for the disadvantaged, and multicultural assessment. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Multicultural Research in Communication Sciences and Disorders.**

### **CSD 394C. Amplifying Systems in Aural Rehabilitation.**

Principles of hearing aid circuitry and looped systems; ear molds and acoustic properties thereof; electroacoustic properties of hearing aids and selection procedures. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Communication Sciences and Disorders 378 or 396M or consent of instructor.

### **CSD 394D. Hearing Conservation.**

Auditory and nonauditory effects of noise; damage-risk criteria; federal and state laws governing noise and noise control; acoustic measurement procedures; identification audiometry; ear protection; nonorganic hearing loss and evaluative procedures. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Communication Sciences and Disorders 378.

### **CSD 394E. Auditory Electrophysiology.**

Review of the auditory nervous system; in-depth evaluation of electrodermal, electroencephalographic, and electrocardiographic audiometry. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Communication Sciences and Disorders 378 or consent of instructor.

### **CSD 394F. Medical Audiology.**

Audiologic implications of pathology and medical and/or surgical treatment of the ear; otologic diagnoses. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Communication Sciences and Disorders 378 or consent of instructor.

### **CSD 394H. Auditory Rehabilitation.**

Acoustic, vocational, social, and psychological rehabilitation of the hearing-impaired child and adult. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Communication Sciences and Disorders 394C or consent of instructor.

### **CSD 394K. Problems in Audiology.**

A review of current literature on diagnostic procedures; habilitation for hearing-impaired children or rehabilitation for adults. Three lecture hours



a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; and Communication Sciences and Disorders 373 and 378, or consent of instructor.

**Topic 1: Aural Habilitation.**

**Topic 2: Psychoacoustics.** Anatomy and physiology of the peripheral auditory system; behavioral measures of auditory performance—masking, sound localization, pitch and loudness perception, temporary and permanent hearing loss. Only one of the following may be counted: Communication Sciences and Disorders 394K (Topic 2), Neuroscience 394P (Topic 6: Psychoacoustics), Psychology 394U (Topic 5: Psychoacoustics).

**Topic 3: Readings in Audiology.**

**CSD 395. Pediatric Audiology.**

Current methods of testing the hearing of young children; included are identification, electrophysiological and operant audiometry, and medical aspects of hearing loss in children. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Communication Sciences and Disorders 378 or consent of instructor.

**CSD 395C. Language Acquisition in Deaf Children.**

Examination of current research studies in expressive and receptive language function; relationships of research to existing classroom procedures. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

**CSD 395G. Strategies for Speech Improvement of the Deaf.**

Designs for evaluation and intervention to improve the speech of deaf students. Three lecture hours a week for one semester. Prerequisite: Graduate standing, concurrent enrollment in Communication Sciences and Disorders 195L, and consent of instructor.

**CSD 395H. Problems in Deafness.**

Selected topics on the implications of deafness for the deaf child's development. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Literacy.**

**Topic 2: Social Psychology of Deafness.**

**Topic 3: Instructional Practices.**

**CSD 195L. Speech Improvement in the Hearing Impaired: Practicum.**

Supervised clinical experience conducting speech development activities with hearing-impaired children. Two hours of clinical teaching a week for one semester. Prerequisite: Graduate standing and concurrent enrollment in Communication Sciences and Disorders 395G.

**CSD 395N. Neurobiological Perspectives on Speech and Language.**

Overview of sensory, motor, and neurophysiological correlates of speech and language. Topics include neuroanatomy and neurophysiology of the human brain, with emphasis on motor pathways, representation in the brain, neuroimaging, neurophonetic processing, and hemispheric specialization. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**CSD 396C. Advanced Amplifying Systems.**

Fitting of advanced amplification systems, including digital hearing aids, frequency modulation and other wireless systems, and assistive listening devices. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Communication Sciences and Disorders 394C.

**CSD 396D. Auditory Processing Disorders.**

Assessment and treatment of disorders of the central auditory nervous system in children and adults. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**CSD 396E. Advanced Auditory Electrophysiology.**

Advanced diagnostic tools, including acoustic immittance, otoacoustic emissions, auditory evoked potentials, intraoperative monitoring, and vestibular function. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Communication Sciences and Disorders 394E.

**CSD 396G. Surgically Implanted Auditory Prostheses.**

Determining candidacy for treatment, programming devices, and evaluating treatment outcomes associated with implantable hearing technologies. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Communication Sciences and Disorders 394F.

**CSD 396M. Instrumentation in Communication Sciences.**

Electrophysiological and electroacoustic procedures in the study of communication behaviors. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

**CSD 396N. Speech Production and Perception.**

Neurophysiological mechanisms underlying the encoding and decoding of speech. Three lecture hours a week for one semester. Only one of the following may be counted: Communication Sciences and Disorders 358S, 396N, Linguistics 358S. Prerequisite: Graduate standing.

**CSD 397, 697, 997. Clinical Externship in Audiology.**

Restricted to students in the Doctor of Audiology program. Intensive clinical experience in a work setting. Individual instruction. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

**CSD 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in communication sciences and disorders and consent of the graduate adviser; for 698B, Communication Sciences and Disorders 698A.

**CSD 398P. Research Project in Audiology.**

Restricted to students in the Doctor of Audiology program. Research supervised by a faculty member. Includes reading and integrating the relevant literature. Students prepare research results in a manuscript suitable for publication. Individual instruction. Prerequisite: Graduate standing and Communication Sciences and Disorders 386N.

**CSD 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in communication sciences and disorders and consent of the graduate adviser.

**CSD 398T. Supervised Teaching in Communication Sciences and Disorders.**

Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

**CSD 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

## CSD 399W, 699W, 999W. Dissertation.

Offered on the credit/no credit basis only. Prerequisite: Communication Sciences and Disorders 399R, 699R, or 999R.

# Communication Studies

*Master of Arts  
Doctor of Philosophy*

## For More Information

**Campus address:** Jesse H. Jones Communication Center (Academic) (CMA) A7.112, phone (512) 471-1942, fax (512) 471-3504; campus mail code: A1105

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Communication Studies, 1 University Station A1105, Austin TX 78712

**E-mail:** [commstudies@austin.utexas.edu](mailto:commstudies@austin.utexas.edu)

**URL:** <http://commstudies.utexas.edu/>

## Facilities for Graduate Work

Facilities available in the Department of Communication Studies include computers with full statistics packages, and ethnographic coding, transcription coding, authoring, editing, and Web design software; these computers also have access to Web survey software. Four carrels are available for confidential data viewing, and are equipped with high-quality Web cams, headphones, and digital transcription machines. The College of Communication's Digital Media Labs provide access to world-class nonlinear audio and video workstations. The college's Instructional Media Center has a library of more than two thousand audio- and videotapes and a conversation library of about two hundred hours of interpersonal interaction, both audiotaped and transcribed.

## Areas of Study

The master's and doctoral degree programs in communication studies provide training in the following areas: interpersonal communication, organizational communication and technology, and rhetoric and language studies.

The Doctor of Philosophy degree with a major in communication studies is a research degree; doctoral students can expect opportunities to work closely with the faculty on research and to participate in the publication of research findings. All doctoral students are expected to achieve mastery of research design principles and methods appropriate to their program of study.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Dawna Ballard	Roderick P Hart
Brenda L Berkelaar	Sharon E Jarvis
Jay Michael Bernhardt	Mark L Knapp
Larry D Browning	Madeline M Maxwell
Barry Brummett	Matthew S McGlone
Richard A Cherwitz	Keri K Stephens
Dana L Cloud	Jurgen K Streeck
Rene M Dailey	Natalie J Stroud
John A Daly	Scott R Stroud
Erin Eileen Donovan	Jeffrey Treem
Joshua G Gunn	Anita L Vangelisti

## Admission Requirements

Entering students must have a bachelor's degree (or the equivalent) from an accredited institution, and their undergraduate preparation should include at least nine semester hours of upper-division coursework in communication studies. All applicants must meet the Graduate School's admission requirements (p. 16).

Satisfying these minimum requirements does not guarantee admission. Each applicant's credentials are scrutinized by each faculty member in the program. No single criterion, such as grade point average or Graduate Record Examinations (GRE) score, is given undue weight in the decision process; every attempt is made to assess the special strengths that the applicant might bring to the program.

## Degree Requirements

With the approval of the Graduate Studies Committee and the graduate dean, work toward the major may be divided among two or more areas in communication. To be counted toward the degree, all coursework in the major must be at the graduate level and must be completed with a grade of at least *B*. Students in the master's degree program must complete a minimum of thirty semester hours of coursework, including a thesis, or a minimum of thirty-three semester hours, including a report. Doctoral students normally complete all requirements in four or five years of graduate study. Individual study programs must be arranged in consultation with the graduate adviser.

## Dual Degree Programs

The Department of Communication Studies offers the following dual degree programs in cooperation with other divisions of the University. More information is available from the graduate adviser in each program.

Field(s) of Study	Degree(s)
Business administration	Master of Business Administration
Latin American studies	Master of Arts
Public affairs	Master of Public Affairs

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## Communication Studies: CMS

### CMS 180E, 280E, 380E, 480E. Conference Course in Communication Studies.

Readings in the literature of communication studies designed to expand the graduate student's opportunity for individual consultation both in research and in informational aspects of the work. One, two, three, or four conference hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing.

### CMS 081M. Introduction to Graduate Studies in Human Communication.

Discussion of communication research, theory, and professional development. One lecture hour a week for one semester. Prerequisite: Admission to the graduate program in communication studies.

### **CMS 383K. Communication Theory.**

Survey of philosophical and language-based approaches to communication; theory construction, research practices, scholarly writing. Three lecture hours a week for one semester. Prerequisite: Graduate standing. Some sections also require consent of instructor or the graduate adviser; these are identified in the Course Schedule.

### **CMS 384K. Communication and Ethnography.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 3: Microethnography of Interaction.** Introduction to the study of details of human interaction: the moment-by-moment organization of speech and embodied communication; the roles of different media of communication, such as language, gesture, and space; the construction of context; uses of the material environment; and the distribution of information in collaborative work settings.

**Topic 4: Communication and Ethnography.** Studies the use of language and communication in ethnographic methods, data collected, and in final reports in a broad range of approaches such as observation and participant-observation, field notes, surveys, interviews of various kinds, textual analysis, and experimental interventions.

### **CMS 386H. Seminar in Health Communication.**

Theory and research in health communication. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing. Some sections may also require consent of instructor or the graduate adviser.

**Topic 1: Managing Health Information.** Introduction to research and theories that examine why and how people exchange, conceal, and otherwise interact with health-related information. Explores the antecedents, processes, and outcomes of communicating about matters of health and illness, with a focus on implications for personal well-being, relational quality, and public health. Communication Studies 386H (Topic 1) and 386P (Topic: Managing Health Information) may not both be counted.

**Topic 2: Interdisciplinary Seminar in Health Communication.** Exploration of the interdisciplinary nature of health communication from an ecological perspective, ranging from intra-personal and interpersonal factors through the roles of populations and policies. Examination of the contributions to health communication from diverse disciplines including healthcare, public health, communication, and psychology. Explores issues related to research, practice, leadership, and partnerships. Additional prerequisite: For masters students, consent of instructor.

### **CMS 386K. Theories of Interpersonal Communication.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing. Some sections also require consent of instructor or the graduate adviser; these are identified in the Course Schedule.

**Topic 1: Interpersonal Communication Theory.** Exploration of theoretical perspectives such as general systems theory; symbolic interactionism; rules theory; theories of language and nonverbal coding; theories of meaning; theories of information processing; and theories of persuasion. Theories pertinent to interpersonal, group, and mass interaction.

**Topic 4: Discourse Analysis.** Examines similarities and differences in the main kinds of discourse analysis and their basic assumptions and typical questions. Designed to develop skills at examining a piece of text or lecture to produce persuasive scholarly analysis.

### **CMS 386L. Group Communication.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing. Some sections also require consent of instructor or the graduate adviser; these are identified in the Course Schedule.

**Topic 1: Group Communication Processes.** Study of theory and research in the dynamics of small groups, with emphasis on the interaction of message variables with other variables such as leadership, affiliation, cohesiveness, and social power.

**Topic 3: Communicating in Groups and Teams.** Focuses on the concepts and theories of communicative processes in task-oriented groups and work teams. Readings cover theory and research related to communication problems, dynamics, and practices in group and team settings. May also include the study of team development, decision making, and trends in group communication research.

### **CMS 386N. Research in Communication Studies.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing. Some sections also require consent of instructor or the graduate adviser; these are identified in the Course Schedule.

**Topic 1: Quantitative Research Methods.** Broad coverage of social scientific techniques for collecting and analyzing communication data; includes measurement, design, and other areas. Some sections focus on organizational research.

**Topic 2: Qualitative Research Methods.** The use of observational and interviewing research techniques for studying human communication.

### **CMS 386P. Issues in Interpersonal Communication.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing. Some sections also require consent of instructor or the graduate adviser.

**Topic 1: Nonverbal Communication.** Current theory and research in such areas as involvement and intimacy, gender, touch, space, environment, nonverbal behavior in children, appearance, and lying. Various methods and measurement techniques for assessing eye gaze, body motion, facial actions, vocal signals, and multichannel events.

**Topic 5: Negative Interpersonal Communication.** An overview of negative features of communication in interpersonal relationships. Examines avoidance, secrets, conflict, relational transgressions, negative emotions, and aggression and abuse.

**Topic 6: Dark Side of Interpersonal Communication.** Provides an overview of issues related to the "dark side" of communication in interpersonal relationships. Subjects include undesired features of interpersonal relationships, seemingly productive communication patterns that are dysfunctional, as well as seemingly destructive patterns that are functional. Communication Studies 386P (Topic: Dark Side of Interpersonal Communication) and 386P (Topic 6) may not both be counted.

**Topic 7: Stereotyping and Prejudice in Interpersonal Communication.** Examines problems posed by stereotyping and prejudice in interpersonal communication, and the research and theory aimed at reducing their impact. Designed to provide opportunities to seek constructive ways of defining and addressing stereotyping and prejudice; emphasis on recent research in the formation, maintenance, and application of stereotypes.

**Topic 8: Metaphor in Communication.** Examines the conceptual structure and expressive forms of the metaphor. Includes the study of classical and contemporary treatment of metaphor in linguistics, philosophy, and rhetoric. Also includes recent social scientific research on the use of figurative devices, such as metaphor, analogy, idiom,

hyperbole, and euphemism, in strategic communication, specifically in managerial communication, political speeches, and religious discourse.

**Topic 9: Perspective Taking.** Examines social scientific research and theories that illuminate human ability to understand or adopt the perspective of others.

**Topic 10: Stress and Coping.** Exploration of how people interact with each other and with their environments during times of change and stress, including the emotions, cognitions, and behaviors that occur when people talk about upsetting or traumatic events and circumstances. Communication Studies 386P (Topic: Stress & Coping) and 386P (Topic 10) may not both be counted.

### **CMS 386R. Issues in Relational Communication.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing. Some sections also require consent of instructor or the graduate adviser; these are identified in the Course Schedule.

**Topic 1: Communication in Relationships.** Theories of development and change; research methods; relationship types; gender and roles; emotion; self-disclosure; secrets; lying; compliments; conflict; complaints; persuasion; dissolution processes; rejuvenating, repairing, and maintaining relationships.

**Topic 2: Family Communication.** Communication and attraction, courtship, marriage, the role of children in the marital relationship, sibling relationships, the effect of spouses' occupations on the family, and dysfunctional families.

### **CMS 386S. Communication, Cognition, and Emotion.**

The cognitive elements involved in social interaction, such as memory, comprehension, plans, decision making, and schemas. Three lecture hours a week for one semester. Prerequisite: Graduate standing. Some sections also require consent of instructor or the graduate adviser; these are identified in the Course Schedule.

### **CMS 388C, 688C, 988C. Doctoral Comprehensive Examination Preparation.**

Restricted enrollment; contact the department for permission to register. Research and reading in preparation for doctoral comprehensive examinations in communication studies. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **CMS 389C. Seminar in Peace and Conflict.**

A survey of the literature and research in the communication of peace and conflict. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing. Some topics also require consent of instructor or the graduate adviser.

### **CMS 090F. Research Internship.**

Participation in faculty-supervised research during the second full year of doctoral study. The equivalent of one lecture hour a week for one semester. Prerequisite: Graduate standing and eighteen semester hours of graduate credit at the doctoral level.

### **CMS 390M. Seminar in Language, Culture, and Interaction.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; some sections also require consent of instructor or the graduate adviser.

**Topic 2: Intercultural Communication.** A selective and critical overview of current approaches to intercultural communication in disciplines such as communication studies, sociology, sociolinguistics, conversation analysis, and anthropology. Only one of the following may be counted: Communication Studies 383L (Topic: Intercultural

Communication), 390M (Topic: Intercultural Communication), 390M (Topic 2).

**Topic 3: The Body in Communication.** Exploration of embodied interaction as 'intercorporeality' and provides students with a methodology for research on bodily practices of communication and social action. Communication Studies 390M (Topic: Body in Communication) and 390M (Topic 3) may not both be counted.

**Topic 4: Conversation Analysis.** The foundations of an interaction-based understanding of language. Texts reflect the evolution of the conversation-analytic paradigm of interaction and language study, and students explore the core organizations that conversation analysts have investigated: turn-taking, repair, turn-construction/action-design, recipient-design, and others. Only one of the following may be counted: Communication Studies 386P (Topic 4), 390M (Topic: Conversation Analysis), 390M (Topic 1), 390M (Topic 4).

### **CMS 390N. Political Discourse.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing. Some sections also require consent of instructor or the graduate adviser; these are identified in the Course Schedule.

**Topic 2: Rhetoric of Social Movements.** Philosophies, strategies, and effects of modern sociopolitical and religious movements designed to produce change.

**Topic 3: Campaign Communication.** An introduction to research surrounding the actors and texts of political campaigns. Covers voters, candidates, consultants, new constituencies, advertisements, debates, speeches, news coverage, party conventions, and new media environments. Focuses on how political discourse affects political life in the United States.

**Topic 4: Politics, Media, and Society.** Examines political life in the United States in relation to television and new media.

**Topic 5: Politics, Media, and the Individual.** Current research and theory in the area of media and politics with particular emphasis on individual-level effects.

### **CMS 390P. Rhetorical Theory.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing. Some sections also require consent of instructor or the graduate adviser; these are identified in the Course Schedule.

**Topic 1: Contemporary Rhetorical Theory.** Investigation of recent definitions, issues, and trends in rhetorical theory, with emphasis on the philosophical bases of rhetoric and the relationship of rhetoric to other disciplines.

**Topic 4: Burke and Symbolic Form.** Covers a selection of books by rhetorical theorist Kenneth Burke, as well as books and articles by recent scholars that use his ideas.

**Topic 5: Foundations of Rhetorical Theory.** Examines historical writings about rhetoric in the Western tradition, up through the Enlightenment. Covers various important figures in the history of rhetoric, including Plato, the sophists, Aristotle, Cicero, Quintilian, Augustine, Christine de Pizan, Vico, and Ramus.

**Topic 6: Rhetoric of Style.** A consideration of social style, including dress, entertainment, vehicles, and living arrangements as a system of communication. Special emphasis on the expressive and practical functions of such symbolic displays.

**Topic 7: Rhetoric and Ideology.** Explores Marxist contributions to rhetorical theory and criticism, with emphasis on ideology and hegemony.

**Topic 8: Rhetoric of Publics and Counterpublics.** Investigation of the role of rhetoric in public life in capitalism in history and today. Covers the roles of rhetoric and rhetorical criticism in the production

and maintenance of publics, and discusses the formation and activities of social movements.

### **CMS 390R. Seminar in Rhetorical Criticism.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing. Some sections also require consent of instructor or the graduate adviser; these are identified in the Course Schedule.

**Topic 1: Basic Rhetorical Criticism.** Elementary methods of analyzing public discourse, including the ways and the reasons that rhetorical analysis is attempted.

**Topic 2: Advanced Rhetorical Criticism.** Survey of six popular schools of thought, including dramatism, Marxism, and structuralism, and their implications for textual analysis.

**Topic 3: Feminist Theory and Rhetorical Criticism.** In-depth consideration of the premises underlying American and European feminism and the effects of such premises on critical experience. Special attention to the ways contemporary texts become gendered.

**Topic 4: Rhetoric and Popular Culture.** Survey of the ways film, television, popular literature, and consumer culture influence our attitudes and values. Consideration of a wide variety of contemporary theorists as well as experience in analyzing contemporary textual artifacts.

**Topic 6: The Object.** Investigation of conceptual and disciplinary anxieties about the object of speech in relation to the history of communication studies, and the deliberate jettisoning of the object in relationship to the history of cultural studies.

**Topic 7: The Subject.** Survey of contemporary theory with attention to subjectivity. Authors may include Alain Badiou, Judith Butler, Jodi Dean, Gilles Deleuze, Rene Descartes, Michel Foucault, Immanuel Levinas, Karl Marx, Friedrich Nietzsche, and Slavoj Zizek.

**Topic 8: Idiom of Haunting.** Examines haunting as a central experience of modern subjectivity rooted in the ontotheological concept of communication. Explores, through the idiom of haunting and ghosts, how the arrival of postmodernity (particularly in respect to mass media technology) has altered how we think about communication and subjectivity in both popular and scholarly ways.

**Topic 9: Rhetoric and Psychoanalysis.** A survey of the various schools of psychoanalysis, and the ways scholars have related psychoanalysis to the object of rhetoric.

### **CMS 390S. Seminar in Organizational Communication.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 1: Narrative Communication in Organizations.** Current theories of narrative and their applications to organizations. Topics include gossip, day-to-day news, and dramatic enactments of organizational communication.

**Topic 2: Power and Politics in Organizational Communication.** The communication implications of sociological and managerial approaches to the study of power and politics, with emphasis on ideas about structure, culture, ideology, information, conformity, voice, and dissent.

**Topic 6: Social Network Analysis.** Focus on quantitatively and qualitatively mapping and measuring the connections, relationships, and flows between entities, such as individuals, teams, groups, organizations, and other information sources. Communication Studies 390S (Topic: Social Network Analysis) and 390S (Topic 6) may not both be counted.

**Topic 7: On Time.** Introduction to the field of chronemics, the study of time as it is bound with communication, via a broad survey of literature across several disciplines. A range of contemporary communication challenges, as well as opportunities for positive communication and organizational scholarship will be interrogated. Communication Studies

390S (Topic: Time Matters) and 390S (Topic 7) may not both be counted.

**Topic 8: Communicating Knowledge.** A broad range of theoretical approaches and empirical research related to the communication of knowledge, including the study of both organizations and processes of organizing among workers. Subjects include: communities of practice, boundary objects, innovation, knowledge management, transactive memory, expertise, and ICT use. Communication Studies 390S (Topic: Communicating Knowledge) and 390S (Topic 8) may not both be counted.

**Topic 9: Health, Safety, and Technology in Organizations.** Examination of the theoretical and empirical research that bridges between organizational, health, and emergency communication with a focus on the role technology plays in these contexts. Communication Studies 390S (Topic 9) and 392P (Topic: Health, Safety, and Technology in Organizations) may not both be counted.

### **CMS 390T. Organizational Communication Theory.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; some topics may require consent of instructor or the graduate adviser.

**Topic 2: Organizational Communication: Macro.** An introduction to selected macro-level or systemic variables in organizations, such as structure, technology, and environments, and to the ways these variables relate to organizational communication processes.

**Topic 3: Postmodern Organizational Communication Theory.** An attempt to integrate the concern in cultural studies for structure with the stream of organizational theory that focuses on chaos. Readings include Clifford and Markus, Clifford, Deleuze and Guattari, March and Olsen, Weick.

**Topic 4: Foundations of Organizational Communication Theory.** Introduction to the major approaches of understanding organizational communication. Examines the theoretical background and analytic skills to navigate tensions among varied approaches at micro-and-macro-levels; explores contemporary scholarship in organizational communication research in a historical context. Communication Studies 390T (Topic: Foundations of Organizational Communication Theory) and 390T (Topic 4) may not both be counted.

**Topic 5: Careers: Theory and Practice.** Examination of the current interdisciplinary definitions, theories, and practices regarding careers and work in contemporary society. Addresses subjects such as employability and/or entrepreneurship, the effect of contemporary technologies, internal/subjective v external/objective success, and work/life balance. Communication Studies 390T (Topic: Careers: Theory and Practice) and 390T (Topic 5) may not both be counted.

### **CMS 390U. Consultation in Organizations.**

A review of social science literature and its application to problem solving and organizational development in field settings. Three lecture hours a week for one semester. Prerequisite: Graduate standing. Some sections also require consent of instructor or the graduate adviser; these are identified in the Course Schedule.

### **CMS 392P. Seminar in Communication Technology.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing. Some sections also require consent of instructor or the graduate adviser; these are identified in the Course Schedule.

**Topic 3: Communication in Virtual Groups.** Examines how people think, feel, and communicate in geographically distributed groups using new technologies. Covers impression formation, impression management, anonymity and social identity, group norms, liking, conformity, trust, conflict, building common ground, and social influence processes.

**Topic 4: Communication Technologies in Organizations.** Examines the theoretical and empirical work on the communicative functions of technology in the workplace.

**Topic 5: Computer-Mediated Communication Models and Methods.** Examines the theoretical and methodological assumptions of computer-mediated communication research. Topics include online impression formation and impression management, online romantic relationships, digital deception, online identity shift effects, and the effects of perceived anonymity when using new communication technologies.

#### **CMS 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in communication studies and consent of the graduate adviser; for 698B, Communication Studies 698A.

#### **CMS 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in communication studies and consent of the graduate adviser.

#### **CMS 398T. Supervised Teaching in Communication Studies.**

Teaching communication studies under supervision. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

#### **CMS 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

#### **CMS 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Communication Studies 399R, 699R, or 999R.

## **Journalism**

*Master of Arts  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Belo Center for New Media (BMC) 3.340B, phone (512) 471-5933, fax (512) 471-7979; campus mail code: A1000

**Mailing address:** The University of Texas at Austin, Graduate Program, School of Journalism, 300 West Dean Keeton Stop A1000, Austin TX 78712

**E-mail:** [sylvia.edwards@austin.utexas.edu](mailto:sylvia.edwards@austin.utexas.edu)

**URL:** <http://journalism.utexas.edu/graduate/graduate-program>

### **Facilities for Graduate Work**

With a mix of national and international scholars, former news media executives, and journalists, the School of Journalism faculty is one of the best and most balanced in the country. Students have access to excellent facilities and state-of-the-art equipment, as well as several special resources. The Harry Ransom Center houses collections such as the Watergate papers of Bob Woodward and Carl Bernstein, as well as the world's first photograph, and the Dolph Briscoe Center for American History houses a variety of archived papers from journalism pioneers such as Walter Cronkite. These facilities and resources support graduate

study in journalism that is designed to prepare students to succeed in the profession in a wide range of careers.

## **Areas of Study and Degree Requirements**

Students can choose one of three tracks for the Master of Arts degree in journalism: professional, research and theory, or professional research hybrid.

The professional track, designed for students seeking professional journalism careers, is intended for three types of students. The first type is the student with an undergraduate journalism degree and/or professional journalism experience who is already familiar with journalistic techniques and can broaden and advance his or her job qualifications through master's level study. The second type of student has little experience in journalism but seeks professional training to supplement an undergraduate degree in another field, such as liberal arts, engineering, or political science. The third type of student has journalism experience outside the United States and seeks to develop an understanding of the purpose, principles, and process of American journalism. The track requires thirty-six semester hours of coursework, including a master's report.

The research and theory track is designed for students who seek a general conceptual foundation for media-related careers, or who plan to pursue doctoral study in journalism or communication. The track requires thirty semester hours of coursework, including a thesis.

The professional research hybrid track combines courses from the professional and research and theory master's tracks. This hybrid will appeal to professionals with significant experience who seek to update their skills, especially in multimedia, or build a research and theory foundation for pursuing an academic career. The track requires thirty semester hours of coursework, including a thesis.

The Doctor of Philosophy degree, which is a research degree in journalism, emphasizes an interdisciplinary approach. Working with the faculty and the graduate adviser, each student develops an individual Program of Work centered around four areas of concentration. All students must select research and theory as two of the areas of concentration. Each area is supported by a variety of courses that focus on concepts, models, and theories, or on research approaches and methodologies.

### **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Rosental C Alves	Robert W Jensen
Mary A Bock	Thomas Jerrold Johnson
Robert B Brenner	Dominic L Lasorsa
Gina Chen	Regina G Lawrence
Hsiang I Chyi	Paula M Poindexter
Renita B Coleman	Stephen D Reese
Tracy S Dahlby	Maggie R Rodriguez
Dennis C Darling	George Sylvie
Donna De Cesare	Russell G Todd

### **Admission Requirements**

Admission to the graduate program in journalism is competitive, and a number of criteria are carefully considered in admissions decisions. Students admitted to the Master of Arts program must hold a bachelor's degree from an accredited institution. Students admitted to the Doctor of Philosophy program must hold a master's degree from an accredited institution.

## Dual Degree Programs

The School of Journalism offers the following dual degree programs in cooperation with other divisions of the University. Each dual-degree arrangement requires completion of a master's report or thesis that applies to both fields of study and is supervised or co-supervised by a faculty member from the School of Journalism. More information is available from the graduate adviser in each program.

Field(s) of Study	Degree(s)
Business administration	Master of Business Administration
Latin American studies	Master of Arts
Global policy studies	Master of Global Policy Studies
Middle Eastern studies	Master of Arts
Public affairs	Master of Public Affairs

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Journalism: J

#### J 380. Introduction to Research Methods.

Research methods and ethics, from design to data analysis and report writing. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and admission to the journalism master's program in research and theory or to the journalism doctoral program.

#### J 380M. Advanced Projects in Photography.

Advanced projects to demonstrate professional competence. Three lecture hours and four laboratory hours a week for one semester. May be taken twice for credit. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

#### J 380N. Advanced Projects in Journalism.

Designed to prepare students to write the master's report. Students develop professional projects to demonstrate their competence in specialized skills; students present, discuss, and critique their own and other students' work. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### J 380V. Visual Journalism.

Basics of aesthetics, visual design, photography, Web publishing, and videography. Two lecture hours and four laboratory hours a week for one semester. Required of first-year students in the journalism master's program professional track. Prerequisite: Graduate standing.

#### J 380W. Writing and Reporting.

Three lecture hours and three laboratory hours a week for one semester. Required of all first-year students in the Master of Arts in journalism program, professional track. Prerequisite: Graduate standing.

#### J 381. Research Methods Seminar.

Research techniques for investigating the control, content, audience, and effects of mass media. Three lecture hours a week for one semester. One topic is required of all candidates for the Master of Arts degree with a major in journalism. May be repeated for credit when the topics vary. Graduate standing.

**Topic 1: Content Analysis.**

**Topic 2: Experimental Design.**

**Topic 4: Qualitative Methods.**

#### J 382. Seminar in Mass Communication.

Readings, research, analyses in mass communications; oral and written reports in an area approved by the instructor. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 4: Agenda Setting.**

**Topic 5: Media Sociology.** Journalism 382 (Topic: Media Sociology) and 382 (Topic 5) may not both be counted.

#### J 383P. Advanced Visual Design.

Advanced exploration of principles and processes of visual design, including design principles, visual perception, typography, image making, uses of color, printing techniques, and publication design. Three lecture hours and three laboratory hours a week for one semester. Only one of the following may be counted: Journalism 338F, 349T (Topic: Advanced Visual Design), 359T (Topic 3: Advanced Visual Design), 383P, 395 (Topic 5: Advanced Visual Design). Prerequisite: Graduate standing.

#### J 384. Mass Communication Theory.

Study of the processes and effects of mass communication. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and admission to the journalism master's program in research and theory or the journalism doctoral program.

#### J 386. Public Relations Seminar.

Readings, research, and analyses in public relations. Examination of the role of public relations in social, economic, and political campaigns. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Research Analyses in Public Relations.**

**Topic 2: Public Relations and Management.**

**Topic 3: Specialized Application of Public Relations.**

**Topic 4: International Public Relations.**

#### J 387P. Cultural Survey of Photography.

Development of photojournalism and commercial, documentary, amateur, and art photography, including historical processes, the evolution of stylistic trends, and the careers of major photographers. Three lecture hours a week for one semester. Only one of the following may be counted: Journalism 347G, 362E, 387P, 395 (Topic: History of Photography). Prerequisite: Graduate standing.

#### J 289, 389, 489. Problems in Specialized Fields.

Research project chosen from area of student's major interests; written report required. Independent study. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Photojournalism.** Additional prerequisite: Journalism 380M.

#### J 389E. Professional Experience in Journalism.

Supervised internship experience in a professional journalism setting. At least ten hours of fieldwork a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### J 390. Seminar in Journalism History.

Research projects in the history of communication media; examination of the social, economic, and political relationships of the media within historical environments. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **J 390P. Advanced Documentary Project.**

Advanced exploration of documentary storytelling skills, with an emphasis on the skills required for the master's report. Three lecture hours and four laboratory hours a week for one semester. Prerequisite: Graduate standing and Journalism 380M.

### **J 392. Seminar in Media Law.**

Research in selected areas of social and legal responsibilities of the media. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Constitutional Issues in Media Law.**

**Topic 2: Studies in Regulation of the Mass Media.**

### **J 395. Topics in Journalism.**

Contemporary social, professional, and intellectual concerns with the practice of journalism. Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 2: Advanced Photo Editing and Design.** Advanced training in photo editing and publication design. Taught abroad; location may vary by semester. Only one of the following may be counted: Journalism 370K (Topic 1: Advanced Photo Editing and Design), 370K (Topic: Advanced Photojournalism in Czechoslovakia), 395 (Topic 2).

**Topic 4: Documentary Tradition of Latin America.** Same as Latin American Studies 381 (Topic 22: Documentary Tradition of Latin America). Study of still photographic and video documentary work by Latin Americans about Latin America. Production of photographic essays on Latin American culture. Three lecture hours and four laboratory hours a week for one semester.

**Topic 9: International Reporting.** Designed to provide students with skills in foreign reporting and an understanding of international news production processes, with special emphasis on Latin America.

**Topic 10: Multimedia Journalism.** Review of online reporting techniques, advanced multimedia skills, and current issues in new media. Three lecture hours and three laboratory hours a week for one semester.

**Topic 11: Advanced Writing and Public Affairs Reporting.** Three lecture hours and three laboratory hours a week for one semester.

**Topic 12: Advanced Social Science Methods.**

**Topic 13: Framing Public Issues.**

**Topic 14: Qualitative Communication Theory.**

**Topic 16: Proseminar in Journalism.** Introduces doctoral students to major areas of research and selected researchers in journalism. Designed to help students cultivate scholarly skills, ethical norms, awareness of funding possibilities, and teaching skills.

**Topic 17: Reporting Asia: A Foreign Correspondent's Framework.** Dynamic ways of looking at, thinking about, and reporting the world. Establishment of a framework for analyzing how the news media cover key events, issues, and processes that shape our lives in a global society. Only one of the following may be counted: Journalism 340G, 349T (Topic 17: Reporting Asia), 395 (Topic 17: Reporting Asia).

**Topic 21: Historical Perspectives in Journalism.** Examines the development of the mass media through social, economic, and political factors that have contributed to changes in the press. Journalism 395 (Topic: Historical Perspectives in Journalism) and 395 (Topic 21) may not both be counted.

**Topic 23: Ethics in Journalism.** Journalism 349T (Topic 12: Ethics in Journalism) and 395 (Topic 23) may not both be counted.

**Topic 24: Media Law.** Examination of legal rights and restrictions for online and print journalism, including Constitutional guarantees, libel, invasion of privacy, and contempt of court. Only one of the following

may be counted: Journalism 395 (Topic: Media Law), 395 (Topic: Media Law and Freedom of Expression), 395 (Topic 24).

**Topic 25: Business and Financial Reporting.** Conceptualizing, sourcing, and preparing news reports on global financial markets, commercial transactions, and company performance. Subject matter is global; the United States is a subset of material covered. Hands-on course during which students produce multiple news packages for publication. Journalism 395 (Topic 25) and 395 (Topic 7: Business Journalism) may not both be counted.

**Topic 26: Covering Politics.** Specialized research, reporting, and writing skills to cover issues, candidates, and campaigns. Journalism 395 (Topic 26) and 395 (Topic: Politics and the Press) may not both be counted.

**Topic 27: Entrepreneurial Journalism.** For-profit and nonprofit journalistic enterprises in the news media ecosystem. Impact of digital technology on the news industry, with emphasis on changes to business and distribution models, and ways people consume and produce news and information. Emphasis on projects and prototypes that include business plans and content planning.

**Topic 28: Computer-Assisted Reporting.** Study of computer-assisted journalism, including electronic document retrieval and manipulation, spreadsheet and database management, and Internet skills. Collaborative work on major investigative projects.

**Topic 29: Oral History as Journalism.** Modules include concepts and methods of gathering oral history; illustration of the techniques using the Vietnam War as a topic; and generating oral history-based coverage focusing on the Mexican American experience. Journalism 395 (Topic 20: Oral History as Journalism) and 395 (Topic 29) may not both be counted.

**Topic 30: Investigative Reporting.** Emphasis on determining what an investigative story is, finding investigative stories, and basic tactics in pursuing those stories. Three lecture hours and three laboratory hours a week for one semester.

**Topic 31: Creative Nonfiction for Magazines and Books.** Reporting and writing skills for producing narrative nonfiction, including writing book proposals, magazine pitches, and sample chapters. Journalism 395 (Topic: Narrative Storytelling) and 395 (Topic 31) may not both be counted.

**Topic 32: Audio Storytelling.** Examination and practice of writing news for audio platforms.

**Topic 33: Explanatory Journalism: Storytelling in a Digital Age.** Examination of the evolution of long-form explanatory storytelling from print and film to new forms of Web-based and interactive storytelling. Three lecture hours and two laboratory hours a week for one semester. Journalism 395 (Topic: Storytelling in a Digital Age) and 395 (Topic 33) may not both be counted.

**Topic 34: Advanced Visual Journalism: Photo.** Explores intensive photographic reportage and documentation using the camera as a tool of investigation and interaction. Emphasis on creation of photo stories, photo essays, and feature stories, with editing and page layout. Three lecture hours and three laboratory hours a week for one semester.

**Topic 35: Producing Social Documentaries for Television News.** Instruction in the production of social documentaries for television, with emphasis on social issues often ignored by television news. Includes production of a twenty-minute long-form story. Three lecture hours and three laboratory hours a week for one semester. Additional prerequisite: Consent of instructor.

**Topic 36: Opinion Writing.** Examines opinion writing and commentary in traditional print and evolving online formats.

**Topic 38: Reporting Latin America.** Foreign reporting skills and international news production processes, with special emphasis on Latin America.

**Topic 39: Covering the Latino Community in the United States.** Development and challenging of views of the contemporary Latino community. Topics include a history of ethnic groups in the United



States and their politics, education, organizations, immigration, culture, power, and media. Students will apply what they learn to other underrepresented people in the United States.

**Topic 40: Reporting China: A Foreign Correspondent's Workshop.** Contemporary social, professional, and intellectual concerns with the practice of journalism.

**Topic 41: Reporting the World: A Critical Examination of the United States News Media.** Examination of dynamic ways of looking at, thinking about, and reporting the world, both abroad and at home. Establishes a framework for analyzing how the news media cover key events, issues, and processes that shape our lives in a global society. Journalism 395 (Topic: Reporting the World) and 395 (Topic 40) may not both be counted.

**Topic 42: Human Rights Journalism.** Exploration of the role of journalists in exposing human rights abuses. Modules include case studies from El Salvador, South Africa, Zimbabwe, Rwanda, Bosnia, Sudan, Israel, and Russia, as well as the legal and moral obligations of journalists as witnesses to atrocities and genocide. Examination of the Bush Administration's global War on Terror and the legacy confronting the Obama Presidency.

**Topic 43: Minorities and the Media.** Issues concerning minority or nondominant groups in the United States. Survey of minority communication problems, including alienation, fragmentation, and media and Internet access. Criticism and feedback for minority groups based on racial/ethnic background, age, sex, disability, social or economic class, and sexual orientation.

**Topic 44: Reporting Texas.** Students work as online reporters, photographers, and editors for the School of Journalism's Reporting Texas website.

**Topic 45: Data Visualization.** Examines how to find compelling data sets, clean and analyze the contents, and then present that result through a variety of methods, including online interactive charts and maps. Journalism 395 (Topic: Data Visualization) and 395 (Topic 45) may not both be counted.

**Topic 46: Gender and the News.** Explores how gender relates to news, both historically and currently, and the role of the news media in reinforcing and/or challenging prevailing stereotypes and attitudes about gender. Focuses on women both as producers of journalism and as subjects of media portrayals. Journalism 395 (Topic: Gender and the News) and 395 (Topic 46) may not both be counted.

**Topic 47: Living in the Information Age.** Examines communication and information technologies, and how individuals, media organizations and corporations employ the Internet for their benefit. Explores how the communication and information technologies evolve and the cultural, economic, political, and social implications of such technologies for society. Journalism 395 (Topic: Living in the Information Age) and 395 (Topic 47) may not both be counted.

**Topic 48: Mobile News Application Design.** Students will work toward building an iPhone application in one semester, with the goal of having an application accepted in the Apple App Store. Journalism 395 (Topic: Mobile News Application Design) and 395 (Topic 48) may not both be counted. Additional prerequisite: Consent of instructor.

**Topic 49: Media and Politics.**

**Topic 50: News for a Mobile Audience.** Examines the mobile world and how journalism and the news audience fit in it. Journalism 395 (Topic: News for a Mobile Audience) and 395 (Topic 50) may not both be counted.

**Topic 51: Quantitative Research Practicum.** Contemporary social, professional, and intellectual concerns with the practice of journalism. Journalism 395 (Topic: Quantitative Research Practicum) and 395 (Topic 51) may not both be counted.

**Topic 52: Reporting on the Environment.** Journalism 395 (Topic: Reporting on the Environment) and 395 (Topic 52) may not both be counted.

**Topic 53: Studio Photography.** An investigation of the fundamentals of photography using principles of studio lighting, theory and practice of contemporary color, location lighting, and production of portfolio-quality work, as applicable to advertising, photographic illustration, and photojournalism. Three lecture hours a week for one semester, with additional hours to be arranged. Journalism 395 (Topic: Studio Photography) and 395 (Topic 53) may not both be counted.

**Topic 54: Web Design for Journalists.** Journalism 395 (Topic: Web Design for Journalism) and 395 (Topic 54) may not both be counted.

**Topic 55: Economics of New Media.** Subjects include the structure, behavior, and performance of media operations; audience behaviors and preferences; competition; and social implications. Journalism 395 (Topic: Economics of New Media) and 395 (Topic 55) may not both be counted.

**Topic 56: Covering the Global Economy.** Journalism 395 (Topic: Covering the Global Economy) and 395 (Topic 56) may not both be counted.

**Topic 57: Journalism and Religion.** Explores some of the world's belief systems, including Judaism, Christianity, Islam, Baha'i, Hinduism, Buddhism, and atheism. Journalism 395 (Topic: Journalism and Religion) and 395 (Topic 57) may not both be counted.

**Topic 58: Media Management.** Examines how and why media leaders behave and operate by assessing current and past research, theories, and practice to arrive at a better view of what it is like to direct and manage a media organization. Students will investigate issues such as market orientation, diversity, group culture, competition, ownership, structure, ethics, and leadership from a media organizational standpoint. Journalism 395 (Topic: Media Management) and 395 (Topic 58) may not both be counted.

**Topic 59: Long-form Feature Writing.** Explores long-form journalism for print, online and books. Students will study the use of narrative, immersion, profile/biography, plots, back stories, and voice. Journalism 395 (Topic: Long-form Feature Writing) and 395 (Topic 59) may not both be counted.

**Topic 60: Media, Culture, and Civic Engagement.** Journalism 395 (Topic: Media, Culture, and Civic Engagement) and 395 (Topic 60) may not both be counted.

**Topic 61: Sports for Reporting Texas.** Designed to serve reportingtexas.com, the School of Journalism's open-content news website. Students will produce original and high-quality journalism for and about Central Texas. Journalism 395 (Topic: Sports for Reporting Texas) and 395 (Topic 61) may not both be counted.

## **J 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in journalism and consent of the graduate adviser; for 698B, Journalism 698A.

## **J 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in journalism and consent of the graduate adviser.

## **J 398T. Supervised Teaching in Journalism.**

Teaching under the close supervision of the course instructor; weekly group meetings with the instructor, individual consultations, and reports required throughout the teaching period. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing, appointment as a teaching assistant, and consent of the graduate adviser.

### **J 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and written consent of the graduate adviser received prior to registering.

### **J 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Journalism 399R, 699R, or 999R, and written consent of the graduate adviser received prior to registering.

## **Public Relations**

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### **Public Relations: P R**

#### **P R 391K. Seminar in Public Relations.**

Survey and analysis of current public relations issues and practices. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

## **Radio-Television-Film**

*Master of Arts*  
*Master of Fine Arts*  
*Doctor of Philosophy*

### **For More Information**

**Campus address:** Jesse H. Jones Communication Center (Academic) (CMA) 6.116, phone (512) 471-3532, fax (512) 471-4077; campus mail code: A0800

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Radio-Television-Film, 2504 Whitis Avenue A0800, Austin TX 78712

**Email:** [rtfgraduatecoordinator@austin.utexas.edu](mailto:rtfgraduatecoordinator@austin.utexas.edu)

**URL:** <http://rtf.utexas.edu/graduate/>

### **Facilities for Graduate Work**

The extensive production facilities of the Jesse H. Jones Communication Center are available to graduate students in radio-television-film, as are the services of Information Technology Services. Research in media history, criticism, and theory is supported by the resources of the University Libraries, the Research and Collections Division of the Dolph Briscoe Center for American History, and the Harry Ransom Center, a major collection of primary materials in literature, film, and the arts. Students in global media have available to them the nationally recognized resources of the Benson Latin American Collection, the Center for Middle Eastern Studies, and the South Asia Institute.

### **Areas of Study**

Students seeking the Master of Arts or the Doctor of Philosophy pursue work in a number of concentrations, including ethnic and minority issues and the media; gender and sexuality issues and the media; global media; media, culture, and society; critical and cultural studies; media history; and technology, culture, and society. Students seeking the Master of

Fine Arts study film and digital media production, or writing for film and television.

## **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Mary C Beltran	Paul J Raval
Charles E Berg	Thomas G Schatz
Wenhong Chen	Nancy Schiesari
Caroline J Frick	Suzanne Scott
Kathryn Fuller	Andrew B Shea
Andrew S Garrison	Ellen R Spiro
Lalitha Gopalan	Laura L Stein
Donald W Howard	Paul J Stekler
Stuart D Kelban	Joseph Straubhaar
Shanti Kumar	Sharon L Strover
Richard M Lewis	Kathleen R Tyner
Madhavi Mallapragada	Samuel C Watkins
Cynthia Ann McCreery	Karin G Wilkins
Alisa H Perren	

## **Degree Requirements**

The student is normally expected to begin coursework in the fall semester.

### **Master of Arts**

The Master of Arts with thesis requires thirty semester hours of coursework, including three hours in Radio-Television-Film 395; the student must take this course in the fall semester of the first year. The Master of Arts with thesis is recommended for students who plan to continue their graduate work after receiving the master's degree. The Master of Arts with report requires thirty-three hours of coursework.

### **Master of Fine Arts**

This degree is available in film and digital media production; or writing for film and television. It is designed for the student with a demonstrated commitment to production or screenwriting as a professional, artistic, or academic pursuit. Production students complete a three-year, sixty-semester-hour program that allows them to develop a foundation of production skills by creating works in both traditional and nontraditional forms. Students must pass annual reviews of their work and must produce a final thesis project for public exhibition during the third year. Writing students complete forty-five hours of coursework in a program that allows them to explore writing for film and television. Students write original screenplays as well as those adapted from other material.

In addition to completing a thesis project (film or script), the students are required to write a report about the process.

### **Doctor of Philosophy**

The Master of Arts or an equivalent degree is required for admission to the doctoral degree program. The program requires completion of at least forty-two semester hours of coursework beyond the master's degree; among these hours must be at least nine hours in research-tools courses and eighteen hours in the student's area of specialization, including Radio-Television-Film 395, taken twice. The student works with a faculty adviser to plan specific course requirements in the area of specialization. In addition to this coursework, the student must pass comprehensive examinations in three academic areas. After successful completion of the comprehensive examinations, the student files an application for candidacy and writes the dissertation.

Upon admission to the graduate program, students must pay a nonrefundable enrollment deposit to indicate that they accept the offer of admission. The deposit is applied to the payment of fees when the student enrolls.

## Dual Degree Programs

The Department of Radio-Television-Film offers the following dual degree programs in cooperation with other divisions of the University. More information is available from the graduate adviser in each program.

Field(s) of Study	Degree(s)
Business administration	Master of Business Administration
Latin American studies	Master of Arts
Middle Eastern studies	Master of Arts
Public affairs	Master of Public Affairs
Russian, East European, and Eurasian studies	Master of Arts

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Radio-Television-Film: RTF

#### RTF 380. Research Theory and Design.

Introduction to research theory and design. Designed to help students develop skills in understanding and critiquing current research, and in designing and proposing research projects. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

#### RTF 380C. Screenwriting for Directors.

Introduction to the study and practice of writing for film and television. Three lecture hours a week for one semester. Required of all production students. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

#### RTF 380G. Research Practices.

Introduction to research implementation. Designed to help students develop skills in conducting a variety of research approaches. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

**Topic 2: Social Capital and Social Networks.** Same as Sociology 396P (Topic 18). Explores theories, methods, and applications, drawing on literatures from sociology, communication, media studies, and management. Examines the relational and structural embeddedness of actors, communities, and organizations, and focuses on how to collect network data and do network analysis. May be counted toward the political sociology, development and globalization specialization in the sociology degree program. Only one of the following may be counted: Radio-Television-Film 380G (Topic: Social Capital and Social Networks), 380G (Topic 2), Sociology 396P (Topic: Social Capital and Social Networks), 396P (Topic 18).

#### RTF 380J. Theory and Principles of Dramatic Writing.

Restricted to students in the Master of Fine Arts screenwriting program in radio-television-film. Introduction to theory and practice in narrative writing for film and electronic media. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

**Topic 1: First-Year Screenwriting.** Required of students in the Master of Fine Arts screenwriting program in radio-television-film. Offered on the letter-grade basis only.

**Topic 2: First-Year Rewriting.** Required of students in the Master of Fine Arts screenwriting program in radio-television-film. Offered on the letter-grade basis only.

#### RTF 380M. Advanced Screenwriting.

Creation and development of written work for film and television production. Students will develop a major work, such as a full-length screenplay, and several shorter pieces. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

#### RTF 380N. Screenwriting Topics.

Creation and realization of professional materials for film and television. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, Radio-Television-Film 380M or the equivalent, and consent of instructor and the graduate adviser.

#### RTF 380P. Production Workshop for Writers.

Exploration of cinematic storytelling through the production of short digital videos. Three lecture hours and three laboratory hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### RTF 881K. Principles of Film and Television Production.

Study of film and video production aesthetics and techniques. Production costs borne by the student. Four lecture hours and four studio hours a week for two semesters, with additional studio hours to be arranged. Prerequisite: For 881KA, graduate standing and consent of instructor and the graduate adviser; for 881KB, Radio-Television-Film 881KA.

#### RTF 384. Communication Theory.

A broad introduction to selected topics in communication theories. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

#### RTF 384C. Seminar: Communication Theory.

An intensive investigation of selected topics in communication theories. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

#### RTF 384N. Internship in Film and Electronic Media.

Practical working involvement with participating media production and research agencies. The equivalent of ten class hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

#### RTF 385K. History of Film.

Survey of the history of the motion picture. Lectures and readings; screenings are required for some topics. Three lecture hours a week for one semester, with one two-hour film screening a week if required by

the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **RTF 385L. Seminar in Film History.**

Advanced study and research in major directors, genres, periods, and movements of film history. Three lecture hours a week for one semester, with one two-hour film screening a week if required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

**Topic 1: United States Television History.** Survey of the history of U.S. television. Screenings are required. Three lecture hours and two hours of television screenings a week for one semester. Radio-Television-Film 385L (Topic: History of Broadcasting) and 385L (Topic 1) may not both be counted. Offered on the letter-grade basis only.

### **RTF 386. Analysis and Criticism of Film and Electronic Media.**

Analysis and explication of representative critics, critical systems, genres, and artists. Three lecture hours a week for one semester, with one two-hour film screening a week if required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **RTF 386C. Seminar: Media Theory and Criticism.**

Advanced study in media theory and criticism. Three lecture hours a week for one semester, with one two-hour film screening a week if required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **RTF 387C. Global Media.**

Study of global media systems, theories, and processes. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **RTF 387D. Communication for Development and Social Change.**

Study of how development institutions use communication strategies for social change, and how development discourse communicates assumptions about social change. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **RTF 387F. Comparative Media Systems.**

Study of media systems across cultural and political boundaries. Three lecture hours a week for one semester, with one two-hour film screening a week if required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **RTF 387G. Global Communication.**

Study of global communication issues. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **RTF 387S. Topics in Global Communication.**

Study of issues in global communication, supplemented by film screenings. Three lecture hours and one two-hour film screening a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **RTF 387W. Global Media: Study Abroad.**

Restricted to graduate students in radio-television-film. Research, analysis, and criticism of global media systems and issues. Students study at institutions outside the United States. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **RTF 288, 388, 488. Research Problems in Specialized Fields of Radio-Television-Film.**

Research project chosen from area of student's major interests. For each semester hour of credit earned, the equivalent of one class hour a week for one semester. Credit earned depends on the nature of the research project. May be repeated for credit. Prerequisite: Graduate standing and consent of the graduate adviser.

### **RTF 288C, 388C, 488C. Research Problems: Doctoral Exam Preparation.**

Research and reading in preparation for doctoral examinations. For each semester hour of credit earned, the equivalent of one class hour a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in radio-television-film and consent of the graduate adviser.

### **RTF 288D, 388D, 488D. Research Problems in Specialty Fields of Radio-Television-Film.**

Research project chosen from area of student's major interests. For each semester hour of credit earned, the equivalent of one class hour a week for one semester. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### **RTF 288E, 388E, 488E. Research Problems in Specialized Fields of Radio-Television-Film.**

Research project chosen from area of student's major interests. For each semester hour of credit earned, the equivalent of one class hour a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### **RTF 388M, 488M. Practicum in Film and Television Production.**

Production of projects in film and video. Production costs borne by the student. For each semester hour of credit earned, one lecture hour a week for one semester; additional laboratory hours vary with the topic. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

**Topic 1: Pre-Thesis Production.** Restricted to students in the Master of Fine Arts production program in radio-television-film. For each semester hour of credit earned, one lecture hour and one laboratory hour a week for one semester. Radio-Television-Film 388M (Topic: Pre-Thesis Production) and 388M, 488M (Topic 1) may not both be counted. Offered on the letter-grade basis only.

**Topic 3: Thesis Production.** Restricted to students in the Master of Fine Arts production program in radio-television-film. For each semester hour of credit earned, one lecture hour and one laboratory hour a week for one semester. Radio-Television-Film 388M (Topic: Thesis Film Production) and 388M, 488M (Topic 3) may not both be counted. Offered on the letter-grade basis only.

**Topic 4: Thesis Postproduction.** Restricted to students in the Master of Fine Arts production program in radio-television-film. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester, with studio hours to be arranged. Radio-Television-Film 388M (Topic: Prac Film/TV: Thesis Postproduction),

488M (Topic: Prac Film/TV: Thesis Postproduction) and 388M (Topic 4), 488M (Topic 4) may not both be counted. Offered on the letter-grade basis only.

### **RTF 388P. Topics in Film and Video Production.**

Restricted to students in the Master of Fine Arts production program in radio-television-film. Production costs borne by the student. Three lecture hours and three laboratory hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **RTF 388R. Project in a Specialized Field of Radio-Television-Film.**

Completion of a research or creative project required for the report option of the master's degree. The equivalent of three class hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in radio-television-film and consent of the graduate adviser.

### **RTF 388S. Research Problems in Specialized Fields of Radio-Television-Film: Production.**

The equivalent of at least three class hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### **RTF 388T. Producing Film and Television.**

Comprehensive consideration of the production process from the standpoint of fiscal and creative management; preproduction and production planning using computer budgeting and scheduling. Software costs borne by the student. Three lecture hours a week for one semester, with studio hours to be arranged. Radio-Television-Film 388P (Topic: Producing Film and Television) and 388T may not both be counted. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **RTF 389. Media and Society.**

Study of selected issues related to media and society. Three lecture hours a week for one semester, with one two-hour film screening a week if required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **RTF 389K. History of Broadcasting.**

Principal eras of broadcast development, audience patterns, legal and industrial precedents of broadcast practices, contemporary industrial and institutional perspectives in radio and television. Three lecture hours a week for one semester, with one two-hour film screening a week if required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **RTF 390C, 490C. Introduction to Editing Processes.**

Introductory editing topics designed to build the foundation for later postproduction practice. Incorporates technical, aesthetic, and practical considerations into an overall view of editing as a process. Three or four lecture hours a week for one semester, with studio hours to be arranged. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **RTF 390E. Advanced Video Postproduction: Audio.**

Restricted to first-year Master of Fine Arts production students in radio-television-film. Theory and application of multitrack audio for video productions. Three lecture hours a week for one semester, with studio hours to be arranged. May be repeated for credit when the topics vary.

Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **RTF 390F. Topics in Production Crafts.**

Professional-level experiences in various topics in the production crafts. Three lecture hours a week for one semester, with additional laboratory hours to be arranged. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in radio-television-film and consent of the graduate adviser.

### **RTF 390G. Introduction to Media Aesthetics and Techniques.**

Introduction to physical and aesthetic aspects of sound, light, and image and to the science and technologies that record and reproduce them. Three lecture hours and two studio hours a week for one semester, with additional studio hours to be arranged. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **RTF 390N. Issues in New Media.**

Issues in new media theory and practice. Three lecture hours a week for one semester, with one screening or studio session of at least two hours a week to be arranged. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **RTF 393C. Telecommunication Information Systems.**

Study of the converging technologies of broadcasting, interactive telecommunications, and information processing. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **RTF 393D. Cable Television and New Video Technology.**

Survey of cable television and other video technologies; analysis of regulation, policy, economics, and industry practices. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **RTF 393N. Telecommunication and Information Policy.**

Analysis of major domestic and international policy issues related to new communications technology. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **RTF 393P. Special Topics in New Communications Technology.**

Applications and effects of new communication and information technology. Three lecture hours a week for one semester, with studio hours to be arranged if required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **RTF 393Q. Special Topics in Digital Media.**

Applications and effects of digital media technologies. Three lecture hours a week for one semester; additional hours may be required for some topics. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **RTF 395. Theory and Literature.**

Advanced seminar surveying the literature of media and communication theories. Three lecture hours a week for one semester. Some sections are required of all doctoral students in radio-television-film or all master's students in radio-television-film; these are identified in the Course

Schedule. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

**Topic 1: Theory and Literature for Doctoral Students: Social Science Approaches.** Restricted to doctoral students. Surveys the literature of social science approaches to communication study.

**Topic 2: Theory and Literature: Humanities Approaches.** Surveys the literature of humanities approaches to media studies.

**Topic 3: Theory and Literature in Media Studies for Master's Students.**

### **RTF 095C. Research Colloquium.**

Restricted to students with graduate standing in radio-television-film. Lectures on subjects to be announced. One lecture hour per week. Required for media studies graduate students. May be repeated for credit. Prerequisite: Graduate standing.

### **RTF 196, 296, 396, 496. Portfolio in Media Production.**

The equivalent of one, two, three, or four lecture hours a week for one semester. Prerequisite: Graduate standing in radio-television-film and consent of the graduate adviser.

### **RTF 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in radio-television-film and consent of the graduate adviser; for 698B, Radio-Television-Film 698A.

### **RTF 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in radio-television-film and consent of the graduate adviser.

### **RTF 398T. Supervised Teaching in Radio-Television-Film.**

Study of the teaching/learning process; practice in classroom presentation. Three lecture hours a week for one semester. Required for appointment as an assistant instructor in radio-television-film; may be taken before or during the first semester of appointment. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### **RTF 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and consent of the graduate adviser.

### **RTF 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Radio-Television-Film 399R, 699R, or 999R, and consent of the graduate adviser.

## **College of Education**

### **Education**

*Master of Arts*

*Master of Education*

*Master of Science in Health Behavior and Health Education*

*Master of Science in Kinesiology*

*Doctor of Philosophy*

*Doctor of Education*

## **Areas of Study**

The College of Education offers graduate degree programs in the following areas: curriculum and instruction; educational administration; educational psychology; foreign language education; health behavior and health education; kinesiology; science, technology, engineering, and mathematics education; and special education.

## **Degree Requirements**

### **Master of Arts**

In addition to fulfilling the general requirements for all master's degrees, the student must complete at least twelve semester hours of advanced course preparation appropriate to the proposed area of concentration. Graduate advisers can provide information about these requirements and any others prescribed by the Graduate Studies Committees.

Before a student is admitted to candidacy, the Program of Work must be approved by the graduate adviser of the area of concentration and the graduate dean. Additional requirements and optional plans open to students in the areas of concentration in education are listed under the appropriate area headings or are available from the area graduate advisers.

### **Master of Education**

In addition to fulfilling the general requirements for all master's degrees, the student must complete twelve semester hours of advanced course preparation appropriate to the proposed area of concentration. Graduate advisers can provide information about these requirements and any others prescribed by the Graduate Studies Committees.

Of the total number of semester hours required, at least eighteen must be in a particular area of concentration, which may be interdepartmental in scope and not necessarily confined to the College of Education.

Before the student is admitted to candidacy, the Program of Work must be approved by the graduate adviser of the area of concentration and the graduate dean. Additional requirements and optional plans open to students in the areas of concentration in education are listed under the appropriate area headings or are available from the area graduate advisers.

### **Master of Science**

A Master of Science is offered in health behavior and health education and in kinesiology. In addition to fulfilling the general requirements for all master's degrees, students in these programs must complete twelve semester hours of advanced course preparation appropriate to the proposed area of concentration, as well as a thesis or a report under the direction of their adviser. Graduate advisers can provide information about these requirements and any others prescribed by the Graduate Studies Committees.

Before a student is admitted to candidacy, the Program of Work must be approved by the graduate adviser of the area of concentration and the graduate dean. Additional requirements and optional plans open to students in the areas of concentration in education are listed under the appropriate area headings or are available from the area graduate advisers.

### **Doctor of Philosophy**

The Doctor of Philosophy is a research degree. The student's Program of Work includes courses in the field of specialization and supporting work outside the major. To be admitted to candidacy, the student is expected to pass a qualifying examination, written or oral or both, and to meet additional requirements established by the Graduate Studies Committee.

Admission to candidacy must be approved by the Graduate Studies Committee and the graduate dean.

Additional requirements, if any, are given in the following sections.

## Doctor of Education

The Doctor of Education is a professional degree. Program requirements vary, but each must focus predominantly on the application of knowledge. The program normally entails an internship. The requirements for admission to candidacy and course requirements are similar to those for the Doctor of Philosophy degree.

Additional requirements, if any, are given in the following sections.

## Curriculum and Instruction

*Master of Arts*  
*Master of Education*  
*Doctor of Philosophy*  
*Doctor of Education*

## For More Information

**Campus address:** George I. Sánchez Building (SZB) 406, phone (512) 471-5942, fax (512) 471-8460; campus mail code: D5700

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Curriculum and Instruction, 1912 Speedway D5700, Austin TX 78712

**E-mail:** [cigrad@uts.cc.utexas.edu](mailto:cigrad@uts.cc.utexas.edu)

**URL:** <http://ci.edb.utexas.edu/>

## Facilities for Graduate Work

The Perry-Castañeda Library offers an extensive collection of material on education, including the Curriculum and Textbook Collections. Students also have access to an array of electronic databases, journals, and books related to curriculum and instruction through the University Libraries Web site (<http://www.lib.utexas.edu>). The College of Education's Information Technology Office includes a graphics laboratory, a media check-out, a computer help desk, and multiple computer laboratories. Other campus facilities, including the UT Learning Center and the laboratories and systems of Information Technology Services, are used extensively, and ongoing research and instructional activities are carried out in local schools.

## Areas of Study

Graduate study is offered in the following areas of specialization: bilingual/bicultural education, cultural studies in education, early childhood education, learning technologies, language and literacy studies, physical education teacher education, and social studies education. Requirements for concentrations in foreign language education and science, technology, engineering, and mathematics education are given elsewhere in this catalog.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Jennifer Keys Adair  
Flavio S Azevedo  
James P Barufaldi  
Randy Bomer  
Anthony L Brown  
Christopher P Brown  
Keffrelyn D Brown  
Rebecca M Callahan  
Darla M Castelli  
Noah De Lissovoy  
Cesar Delgado  
Susan B Empson  
Kevin M Foster  
Louis Harrison  
James V Hoffman  
Elaine K Horwitz  
Joan Hughes  
Jessica H Hunt  
Xiaofen Keating  
Min Liu

Anna E Maloch  
Jill A Marshall  
Ramon Antonio Martinez  
Deborah K Palmer  
Katherina A Payne  
Anthony J Petrosino  
Diana Christine Pulido  
Paul E Resta  
Catherine Riegler-Crumb  
Nancy L Roser  
Loriene Roy  
Cynthia S Salinas  
Victor Sampson  
Allison Skerrett  
Walter M Stroup  
Jarvis W Ulbricht  
Luis Urrieta  
Angela Valenzuela  
Melissa R Wetzel  
Mary J Worthy

## Degree Requirements

### Master of Arts

General requirements are those for the master's degree on the Degree Requirements (p. 22) page, except that students may count no more than six semester hours of upper-division coursework toward the degree. The thesis option requires thirty hours of coursework; the report option requires thirty-three hours. Students who choose the language and literacy studies specialization, however, complete thirty-six hours of coursework for either option. For specific requirements and optional plans, consult the graduate adviser.

### Master of Education

In addition to the general requirements for all master's degrees, students must present evidence of appropriate teaching or related experience. The MEd generally requires thirty-six hours of coursework, without a thesis or a report. In some specializations, a thirty-three-semester-hour option is available. This option requires a report. For specific requirements and optional plans, consult the graduate adviser.

### Doctor of Philosophy

Students seeking the degree of Doctor of Philosophy must show evidence of related academic and professional experience, including a master's degree or the equivalent.

### Program Requirements

Each student must complete at least eighteen semester hours of organized coursework in the Department of Curriculum and Instruction. The faculty in each specialization has established a minimum number of hours of coursework required for that program.

**Core courses.** All students must complete nine hours in courses that form the theoretical foundation for the study of curriculum and instruction. Courses must be taken in teaching and teacher education, curriculum theory and development, and sociocultural foundations of education.

**Research methodology.** At least twelve hours in research methodology are required, consisting of three hours in each of the following: philosophical foundations of research, qualitative methods, quantitative methods, and an advanced course in either qualitative or quantitative

research methods. Current knowledge of statistics is a prerequisite for the quantitative research methods course.

**Directed research.** Twelve hours in directed research are required. This requirement may be fulfilled with organized coursework that has a substantial research component and requires a research project, or through faculty-guided research studies.

**Specialization courses.** This coursework is defined by the faculty in the area of specialization.

## Review and Examination Requirements

**First review.** When the student has completed approximately one year in residence, or about eighteen hours of coursework, the faculty will assess his or her progress and likelihood of finishing the program based on performance in coursework and progress in research.

**Midprogram review.** The area faculty conducts a midprogram review when the student has completed between twenty-seven and thirty-six semester hours of coursework, including some of the required hours of directed research. Requirements vary by program area, but all students are expected to submit evidence of research activity, either conducted or proposed, and usually developed as part of Curriculum and Instruction 396T. A favorable review results in the student's continuation in the program. An unfavorable review may result in additional requirements or dismissal from the program.

**Qualifying examination.** To be admitted to candidacy for the degree, the student must pass a qualifying examination according to guidelines established by the faculty in the area of specialization.

**Dissertation.** The quality and significance of the dissertation must conform to the guidelines of the Graduate School. The PhD dissertation should make a significant contribution to knowledge and educational theory.

## Doctor of Education

The Doctor of Education is a professional degree. The degree program differs from that leading to the Doctor of Philosophy in its predominant focus on the application of knowledge and in the nature of the dissertation. At least three years of related professional experience and a master's degree or the equivalent are required for admission to this degree program.

## Program Requirements

Each student must complete at least eighteen semester hours of organized coursework in the Department of Curriculum and Instruction. The faculty in each specialization has established a minimum number of hours of coursework required for that program.

**Core courses.** All students must complete twelve hours in courses that form the theoretical foundation for the study of curriculum and instruction. Courses must be taken in learning and teaching and teacher education, curriculum theory and development, and sociocultural foundations of education.

**Research methodology.** At least six hours in research methodology are required.

**Field research/internship.** At least six hours in field research are required, completed over at least two semesters. This research is most often conducted in a school setting and may be done during an internship. It need not be done as part of an organized course but must be directed by a faculty member.

**Specialization courses.** This coursework is defined by the faculty in the area of specialization.

## Review and Examination Requirements

**First review.** When the student has completed approximately one year in residence, or about eighteen hours of coursework, the faculty will assess his or her progress and likelihood of finishing the program as shown by performance in coursework.

**Midprogram review.** After two semesters of field research or about two years in the program, the student submits for faculty review a written report based on the field research/internship. A favorable review results in the student's continuation in the program. An unfavorable review may result in additional requirements or dismissal from the program.

**Qualifying examination.** To be admitted to candidacy for the degree, the student must pass a qualifying examination according to guidelines established by the faculty in the area of specialization.

**Dissertation.** The quality and significance of the dissertation must conform to the guidelines of the Graduate School. In general, the EdD dissertation should make a significant contribution to knowledge about educational practice.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Curriculum and Instruction: EDC

#### EDC 380F. Sociocultural Foundations.

Problems and issues in the study of education from a sociocultural perspective. Examines research in different fields, including history, sociology, and anthropology of education; innovative education reform in the field of multicultural education; and issues of racial, class, and gender inequality. Includes a critical assessment of the American public school system, with an emphasis on social justice. Three lecture hours a week for one semester. Prerequisite: Graduate standing and admission to a Doctor of Education or a Doctor of Philosophy degree program.

#### EDC 380G. Anthropology of Education.

Same as Anthropology 388K (Topic 2: Anthropology of Education). A study of social life in contemporary American schools from an anthropological perspective. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and twelve semester hours of upper-division coursework in education or consent of instructor.

#### EDC 380R. Educational Research and Design.

An introduction to the methodology of social science research, with a focus on the field of education. Examines the fundamental assumptions, principles, and procedures of research; the meaning of knowledge and the ways in which knowledge may be acquired and communicated to others; preparation and utilization of effective questions; principles of data collection and data analysis; drawing conclusions from data; and evaluation of current research. Three lecture hours a week for one semester. Prerequisite: Graduate standing and admission to a Master of Arts or a Master of Education degree program.



### **EDC 380T. Writing: Process and Pedagogy.**

Studies research, theory, pedagogy, and curricula in writing for school and extracurricular settings and investigates personal writing processes, habits, and strategies. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **EDC 380W. Teaching Composition.**

Topics in the methodologies for the teaching of writing in American elementary, intermediate, and secondary classrooms. Topics may include writing assessment, connections between school and other settings, reading-writing connections, writing development, writing to think and learn, writing for a range of purposes and in a range of genres, and classroom structures for the teaching of writing. Three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing.

### **EDC 381F. Introduction to Teaching and Teacher Education.**

Examines research on teaching, research in teacher education, and modes of inquiry. Three lecture hours a week for one semester. Prerequisite: Graduate standing and admission to a Doctor of Education or a Doctor of Philosophy degree program.

### **EDC 381J. Curriculum Organization.**

Designed for master's degree students with majors outside curriculum and instruction and for doctoral students needing to update preparation. An overview of theories, principles, and issues in curriculum construction for modern education. The equivalent of three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **EDC 381M. Designs for Instruction.**

Examination of the instructional design process at one of the following levels: elementary school, secondary school, higher education, all-level. Emphasis on promising practices and current efforts toward improvement. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, twelve semester hours of upper-division coursework in education, and teaching experience.

### **EDC 381R. Introduction to Systems of Human Inquiry.**

Designed to provide students with the knowledge and competence in social science research methods required for careers in teaching or human services. Explores competing definitions of research; the idea of a research paradigm; characteristics of various forms of inquiry, including quantitative and qualitative research; and research methods in relation to issues of ethics and rigor. Three lecture hours a week for one semester. Curriculum and Instruction 381R and 385G (Topic: Introduction to Systems of Human Inquiry) may not both be counted. Prerequisite: Graduate standing and admission to a Doctor of Education or a Doctor of Philosophy degree program.

### **EDC 382E. Teaching Elementary School Subjects.**

Examination of the discipline of the subject-field selected, coupled with intensive study of research findings, publications of learned societies, and advanced experimentation with the improvement of instruction. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, twelve semester hours of upper-division coursework in education, an undergraduate course in the subject-field selected (if appropriate), and teaching experience or consent of the graduate adviser.

**Topic 1: Reading.** Additional prerequisite: Curriculum and Instruction 370E (Topic 19: Reading/Language Arts) or the equivalent.

**Topic 2: Language Arts.**

**Topic 3: Science.**

**Topic 4: Social Studies.**

**Topic 5: Mathematics.**

**Topic 6: Foreign Language.** Additional prerequisite: Twelve semester hours of upper-division coursework in foreign language or consent of instructor.

**Topic 7: The Humanities.** An examination of personal values and such areas in the humanities as philosophy, music, art, drama, dance, and literature to provide richer educational experiences.

**Topic 8: English as a Second Language.** Additional prerequisite: Consent of instructor.

**Topic 9: Early Childhood Education.**

**Topic 10: Bilingual Education.** Additional prerequisite: Knowledge of Spanish.

### **EDC 382R. Fundamentals of Statistics.**

Designed for students majoring in the social sciences. Three lecture hours a week for one semester. Prerequisite: Graduate standing and admission to a Doctor of Education or a Doctor of Philosophy degree program.

### **EDC 382S. Teaching Secondary School Subjects.**

Examination of the discipline of the subject-field selected, coupled with intensive study of research findings, publications of learned societies, and advanced experimentation with the improvement of instruction. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, twelve semester hours of upper-division education, twelve semester hours of upper-division coursework in the subject-field of the topic or consent of instructor, and teaching experience or consent of the graduate adviser.

**Topic 1: Reading.**

**Topic 2: English.**

**Topic 3: Science.**

**Topic 4: Mathematics.**

**Topic 5: Social Studies.**

**Topic 6: Foreign Language.**

**Topic 7: English as a Second Language.**

**Topic 8: Instructional Technology.**

### **EDC 382T. Problems of College Teaching.**

Methods and procedures for teaching in specific fields selected by participants; major emphasis on successful classroom practices. Three lecture hours a week for one semester. Prerequisite: Graduate standing and an interest in teaching at the college level.

### **EDC 383C. Bibliography in Teaching and Curriculum.**

Survey of the scholarly literature in teaching and curriculum, with emphasis on bibliographic sources and techniques. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **EDC 383F. Curriculum Theory.**

An introduction to the central issues in curriculum theory. Includes historical and contemporary approaches to the philosophy and analysis of curriculum, and curriculum theory and practice. Emphasis on the issues of power, knowledge, and exclusion. Three lecture hours a week for one semester. Prerequisite: Graduate standing and admission to a Doctor of Education or a Doctor of Philosophy degree program.

### **EDC 383T. Instructional Theory.**

Identification and analysis of the major types of contemporary instructional theory. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **EDC 185G, 385G. Seminar: Program Development and Research.**

Advanced investigations of selected topics and problems in curriculum theory, program design, and research design at one of the following

levels: elementary school, secondary school, higher education, all-level. The equivalent of one or three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Global Comparative Early Childhood.** An examination of international and indigenous perspectives on early childhood, as well as the types of fieldwork and comparative inquiry that international research requires using work from early childhood scholars within anthropology, child development, psychology, sociology, and early childhood education. Students will prepare a research proposal for a comparative and/or international project with or about young children.

**Topic 2: Parents and Education.** An exploration of the relationship between families and schooling in the United States through racial, class-based, linguistic, cultural, and global perspectives, using multiple theoretical frameworks to both understand and challenge current approaches towards parental involvement in school.

**Topic 4: Second Language Acquisition.**

**Topic 5: The Second Language Learner.** Additional prerequisite: Curriculum and Instruction 385G (Topic 4) or consent of instructor.

**Topic 6: Linguistics and Language Teaching.** Designed primarily for participants in international education exchange programs. Application of the findings of linguistics to the teaching of language.

**Topic 7: Language and Politics in Language Planning.**

**Topic 11: Action Technologies.**

**Topic 17: Culture, Gender, and Race in Organizations.**

**Topic 19: Managing Human Resource Development.**

**Topic 21: Training and Development.**

**Topic 24: Qualitative Research: Mixed-Method Investigation.**

Additional prerequisite: Completion of one qualitative research methods course.

**Topic 25: Life History Research.**

**Topic 27: Qualitative Research: Naturalistic Inquiry.**

**Topic 28: Multimedia Authoring.**

**Topic 29: Interactive Multimedia Design and Production.** Engaging in the design and production process through work with a client on an interactive, web-based application through new media technology tools. Emphasis on industry standard technology: graphics, video, audio, animation, and web development.

**Topic 30: Advanced Qualitative Research: Discourse Analysis.**

Additional prerequisite: Completion of one qualitative research methods course; completion of a graduate course in linguistics, sociolinguistics, or psycholinguistics; and admission to the doctoral program.

**Topic 31: Inquiry in Play.** An examination of play as a meaningful aspect of curriculum and child development; philosophical, psychological, and educational perspectives on play; and the grounding of educational play research in broader fields of inquiry.

**Topic 32: Advanced Science and Mathematics Education.**

**Topic 33: Computer-Supported Collaborative Learning.** Explores current research, theories, and strategies of computer-supported collaborative learning. Includes web-based activities focused on collaborative inquiry and writing, and approaches to project-based and foreign language learning.

**Topic 34: Language, Culture, and Identity.**

**Topic 35: Constructivism and Instructional Design.** Examines the philosophical, rhetorical, practical, and evaluative bases for constructivist approaches to instructional design. Students visit one constructivist classroom at the kindergarten through grade twelve level, and one at the college level.

**Topic 36: Content and Instruction of Reform Algebra.**

**Topic 37: Critical Issues in Bilingual and Bicultural Education.**

**Topic 38: Critical Perspectives on Early Childhood Education.** Designed to allow students to examine and evaluate early childhood

education research, practice, and curricula; and to question preconceived notions about working with young children.

**Topic 40: Current Issues in Teaching Social Studies.**

**Topic 41: Curriculum Development in School Systems.**

**Topic 42: Curriculum History in Science, Technology, Engineering, and Mathematics Education.** The historical development of science, technology, engineering, and mathematics curricula in the United States from the mid-nineteenth century to the present. Discusses politics, equity, the development of technology, and theories of learning; and examines current curricular trends. Prerequisite: Curriculum and Instruction 385G (Topic 59: Knowing and Learning in Science, Technology, Engineering, and Mathematics Education).

**Topic 43: Curriculum in Science and Mathematics Education.**

**Topic 44: Curriculum Theories for Prekindergarten and Kindergarten.**

**Topic 45: Designs and Strategies for New Media.** Explores human-computer interaction (HCI), emphasizing designs and strategies for new media through various evaluations and hands-on activities. Examining the use of new media from the perspectives of information design, interaction design, and interface design; and using industry standard new media tools to illustrate understanding.

**Topic 46: Early Childhood Education Programs.** Investigation of various approaches to early childhood education. Examines philosophical, theoretical, historical, and empirical bases of education programs and curricula, and includes current trends.

**Topic 47: Educational Communication Networks: Theory and Practice.**

**Topic 48: Educational Communication: Diffusion of Innovation.**

**Topic 49: Educational Communication: The Internet.**

**Topic 50: Education in Contemporary Black America.**

Contemporary issues affecting the educational outcomes of black students in the United States, including recent immigrants. Emphasis on the historical relationships of education and educational philosophy to people of African descent in the United States.

**Topic 51: Feminist Participatory Action Research.** An overview of feminist social-action theory and research. Studies social action within the local community setting and with community projects.

**Topic 52: Foundations of Instructional Technology.**

**Topic 53: Curriculum and High-Stakes Testing.** Explores the provisions of state and federal legislation regarding high-stakes testing, including the implications for culturally and linguistically diverse student populations, the motivations for use, and the impact upon curricula, teaching, and student academic performance.

**Topic 54: The History of American Reading Instruction.** A historical analysis of the methods and materials used in beginning reading instruction in American schools. Focuses on philosophical schools of thought, technological changes, societal issues, and research.

**Topic 55: Historical Perspectives on Curriculum.**

**Topic 56: Service Learning as an Instructional Strategy.**

**Topic 57: Learning Technology Planning and Management.**

Current theories, research, and strategies related to the planning and management of learning technology projects. Exploration of funding proposals, strategic planning, and the use of planning tools such as surveys, inventory forms, project management aids, and decision-support systems.

**Topic 58: Multicultural Education in Austin.** Explores local educational and community resources for teaching from a multicultural and global perspective. Curriculum and Instruction 385G (Topic 58) and 385G (Topic: International Austin: Multicultural Classrooms) may not both be counted.

**Topic 59: Knowing and Learning in Science, Technology, Engineering, and Mathematics Education.** Explores various theories related to science, technology, engineering, and mathematics

epistemology. Includes memory and the structure of knowledge, problem solving and reasoning, and the foundations of learning.

**Topic 60: Language Acquisition in Multicultural Special Education.**

**Topic 61: International Perspectives on Literacy Development.**

Curriculum and Instruction 385G (Topic 61) and 385G (Topic: Literacy Development: International Perspectives) may not both be counted.

**Topic 62: Education in Contemporary Black America.** Examines the historical and contemporary philosophies, practices, and pedagogies for Black education. Includes culturally responsive pedagogy, African-centered pedagogy and curriculum, multicultural curriculum and critical race theory.

**Topic 63: Identity, Agency, and Education.** Considers the cultural production of identity and identity politics and agency within a cultural, political, racial, gender, and activist framework in relation to education.

**Topic 64: Cultural Theory in Education.** Investigation of theories of popular culture, cultural difference, and cultural politics, and their applications in educational research and practice. Focuses on the relation between culture and power, with attention to issues of identity as well as social structure.

**Topic 65: Critical Pedagogy.** Introduction to critical pedagogy, focusing on theoretical foundations and methodologies of teaching and curriculum. Explores approaches to education oriented toward the development of critical consciousness, empowerment, and social action.

**Topic 67: Cultural Knowledge of Teachers and Teaching.**

Examines how scholars have utilized cultural theory and cultural knowledge to situate and respond to: the identity, role and responsibility of "being" a teacher; the pedagogic functioning of teaching; and teacher preparation. Particular emphasis is placed on how these factors concern the education of historically marginalized student population.

**Topic 68: Women and Education: Research, Theory, and Practice.**

Explores the roles and experiences associated with women and girls in the broad field of education. Subjects related to women across a diverse social terrain are targeted including: historical scholarship, research, theoretical frameworks and policy issues.

**Topic 69: Chicana Feminist Theorists.** Explores current historical and theoretical writings of Chicana women feminist theorists. Themes include patriarchy, domination/resistance politics, epistemology, contestation, social reproduction, identity and difference and how these connect to schooling practices, policies, and politics.

**Topic 70: Chicana Participatory Action Research.** Investigates the history and philosophy of participatory action research, including that done by and for Chicanas. A research project benefiting Chicanas and other young, Latina females in a public educational setting will be required.

**Topic 71: Exploration in the Education of the Mexican American Child.** Provides a historical and contemporary overview of Mexican American children's schooling experiences that consider tracking, bilingual education, school finance, higher education access, and standardized testing.

**Topic 72: Race and Ethnic Relations in Schools.** Investigates the role of race and ethnicity as key organizing principles of society. Themes include individual and institutional racism, reproduction theory, cultural and structural assimilation, critical race theory, epistemology, anti-racist and culturally relevant pedagogy.

**Topic 73: Seminar in Advanced Educational Policy.** Investigates policy from a critical policy analysis perspective. Considers the importance of context, discourses, players, and policy articulations that influence policy development primarily in education and areas such as immigration and the economy.

**Topic 74: History of American Reading Instruction.** Focuses on shifts in reading pedagogy in relation to changing societal conditions in the United States from colonial times through the 1980s. Engages with

instructional materials and investigate practices through readings and course lectures. Considers historical research methods including oral history.

**Topic 75: Reading and Writing in the Elementary School.** Offers an overview of methods, materials, and assessments used in the reading and writing instruction at the elementary level. Focuses primarily on classroom and school level processes with additional consideration of the instruction for special needs learners.

**Topic 76: Literacy and Culture.** Examines the relationship between culture and literacy from a variety of theoretical perspectives including New Literacy Studies, identity and agency, sociocritical literacy and critical race theory with a particular emphasis on discourse and social change.

**Topic 77: Classroom Discourse and Teacher Research.** Designed as a collaborative, critical examination of teacher/action research, particularly in relation to the exploration of classroom discourse. Focuses on the rationale, issues, and implications of the teacher research movement within education and on the research strategies and techniques that can be used by teachers in conducting research in their own classroom settings.

**Topic 78: The Teaching of Literacy.** Develops a stance of inquiry into teaching from a social practices framework. Emphasis will be on formulating thoughtful and theoretical questions to enhance the quality of interactions with children in classrooms; making ideologies that operate within the school literacy communities explicit; and looking through informed and critical lenses at each aspect of literacy instruction.

**Topic 79: Sociolinguistics in Research and Teaching.** Focuses on the sociocultural investigation of language, particularly as it pertains to educational settings. Traces the historical emergence of the related fields of sociolinguistics and linguistic anthropology, exploring how each of these scholarly traditions approaches the study of language, identifying key points of overlap and tension between the two fields, and discussing recent examples of inter-disciplinary scholarship. Issues to be addressed include linguistic variation, language and identity, bilingualism and multilingualism, language ideologies, and classroom discourse.

**Topic 80: Orality, Literacy, and Technology.** Explores the relationships among speech, writing, and technology across human history, in contemporary cultures, in individual lives, and in processes of education. Situates discussions of "new literacies" in the context of the history of literacy.

**Topic 81: Research on Adolescent Literacy In and Out of School.** Considers ways in which the literacy practices of youth in out-of-school settings and the literacy work of schools might productively inform each other, and examines the purposes, processes, and outcomes of this literacy work.

**Topic 82: Major Theorists in Early Childhood.** Studies a historical range of theorists who have tried to explain childhood and early learning in the fields of anthropology, psychology, philosophy, education, and child development.

**Topic 83: Research on Teacher Education in Physical Education.** Discusses philosophical orientations such as progressivism, post-modernism, humanism, and social reconstruction. Of particular value to those in the doctoral program in physical education teacher education.

**Topic 84: Contemporary Problems in Science, Technology, Engineering, and Mathematics Education.** Identifies and explores contemporary problems in science and mathematics education through collaboration with a practitioner in the field.

**Topic 85: Current Issues in Physical Education.** Explores and critically analyzes current issues, coalitions, and legislation related to physical education and develops the understanding and skills necessary to impact the future directions.

**Topic 86: Critical Perspectives in Early Childhood Education.** Critically analyzes scholars of early childhood education research,

practice, and curricula. Questions assumptions about early childhood education; beliefs, theories, and ideas about working with young children, their families, and the communities in which they live and work. Curriculum and Instruction 185G, 385G (Topic 38) and Curriculum and Instruction 185G, 385G (Topic 86) may not both be counted.

**Topic 87: Technology, Teacher Learning, and School Change.** Examines the complexity of the change process, especially in relation to the introduction of digital technologies in the PK-12 school context.

**Topic 88: Research on Early Childhood Education.** An introduction to research practices in the field of early childhood education. Classic studies and research reviews in various facets of early childhood education will be reviewed. Subjects include: child development, early childhood program models and evaluation, curriculum (including concept development and play), parent involvement, and teacher education in early education.

**Topic 89: Social Construction of Thinking in Childhood.** An intensive exploration of social constructivism, particularly Vygotskian theory and research. Classroom interactions, teaching and learning, parent and family contributions to education, cultural influences, and other contextually applicable aspects of education will be explored.

**Topic 90: Social Contexts of Early Childhood Education.** With a sociological lens, an examination of the constructs of the child and childhood through a range of social, political, educational, and economic contexts.

**Topic 91: Early Childhood Education Programs.** An examination of specific approaches to early childhood education including as the Montessori approach; programs such as Head Start; and critical analysis of how these various models of early childhood education define their role within the education of the young child as well as define the role of the child, teacher, and family. Philosophical, theoretical, historical, and empirical approaches to the field will be investigated.

**Topic 92: Theories of Curriculum for Pre-kindergarten and Kindergarten.** An exploration of the central issues and theoretical orientations of curriculum theory and practice in early childhood and elementary public school programs in the United States.

**Topic 93: Evaluation in Language Education.** Explores the policy and classroom implications of language assessment and evaluation practices, including review and critique of the assessment of English language proficiency for language minority students, standardized language assessment tools, and informal classroom-based methods for assessing language.

**Topic 94: Immigration Theory in Education.** An investigation of sociological, psychological, and anthropological perspectives of immigration theory and immigration post-1965 as they apply to educational research and immigrant youth in United States schools.

**Topic 95: Language Policy in Education.** Explores the implications of the perception of language as alternately a right, a resource, and a problem. Emphasis is on the development of linguistic support movements (bilingual, ESL, AAVE/Ebonics, etc.) as well as implicit and explicit language policies in the United States and in other countries.

**Topic 96: Bilingual and New Literacy Studies.** Focuses on the theoretical foundations of bilingual theories and new literacy studies.

**Topic 97: Bilingual and Culture.** Includes theories and research topics relevant to teaching and learning literacy in two languages, Spanish and English. Discussion of the ways in which sociocultural, linguistic, and academic factors influence bilingual development.

**Topic 98: Social, Cultural, and Political Contexts of Language Learning.** An analysis of oral and written language learning from interdisciplinary perspectives and within a variety of contexts, both within and outside of school settings. Particular attention is paid to issues of pedagogy, "non-standard" dialects of English, second-language learning, and multilingualities.

**Topic 99: Curriculum in Physical Education.** An examination of current research regarding physical education curriculum paradigms, reform initiatives, and physical activity interventions as related to curriculum.

### **EDC 385H. Cultural Transmissions in America.**

Analysis of contemporary social, political, and economic trends in national and international life from the standpoint of educational implications.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, twelve semester hours of upper-division coursework in social science, and twelve semester hours of upper-division coursework in education.

### **EDC 385K. General Foundations of Education.**

Designed for curriculum and instruction doctoral students preparing for qualifying examinations and other master's or doctoral degree students without previous work in foundations of education. General survey of basic concepts, topics, and policy issues in the foundations of education. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **EDC 385R. Introduction to Quantitative Research.**

Designed to help students develop skills in a variety of approaches and methodologies used in research design that requires quantitative methods. Focuses on multivariate methods; and includes research questions, purposes, methodologies, instruments, measures, participant selection, data collection and data analysis methods, results, and conclusions. Three lecture hours a week for one semester. Prerequisite: Graduate standing; admission to a Doctor of Education or a Doctor of Philosophy degree program; and Curriculum and Instruction 382R, Educational Psychology 371, or an equivalent introductory statistics course and consent of the graduate adviser.

### **EDC 386R. Introduction to Qualitative Research.**

An introduction to the theoretical and methodological issues central to conducting qualitative research studies. Designed to help students develop practical research skills, and includes opportunities to evaluate current research, analyze data, observe, and interview. Three lecture hours a week for one semester. Curriculum and Instruction 385G (Topic: Qualitative Research in Educational Settings) and 386R may not both be counted. Prerequisite: Graduate standing and admission to a Doctor of Education or a Doctor of Philosophy degree program.

### **EDC 387R. Topics in Advanced Quantitative Research.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, Curriculum and Instruction 385R, and admission to a Doctor of Education or Doctor of Philosophy degree program.

**Topic 1: Advanced Quantitative Analysis.**

**Topic 2: Statistical Inference.**

**Topic 3: Survey Research Methods.** Curriculum and Instruction 385G (Topic: Survey Research Methods) and 387R (Topic 3) may not both be counted.

### **EDC 388R. Topics in Advanced Qualitative Research.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, Curriculum and Instruction 386R, and admission to a Doctor of Education or a Doctor of Philosophy degree program.

**Topic 1: Narrative and Oral Tradition.** Curriculum and Instruction 385G (Topic: Narrative and Oral Tradition) and 388R (Topic 1) may not both be counted.

**Topic 2: Discourse Analysis.** Additional prerequisite: Completion of one qualitative research methods course, and completion of a graduate course in linguistics, sociolinguistics, or psycholinguistics.

**Topic 3: Ethnographic and Qualitative Research Methods.**

Curriculum and Instruction 385H (Topic: Ethnographic and Qualitative Research Methods) and 388R (Topic 3) may not both be counted.

**Topic 4: Postmodern Analytical Methods.** Curriculum and Instruction 385G (Topic: Advanced Qualitative Research: Postmodern Analytical Methods) and 388R (Topic 4) may not both be counted.

**Topic 5: Life History.**

**Topic 6: Naturalistic Inquiry.**

**Topic 7: Feminist Participatory Action Research.**

**Topic 8: Mixed-Method Investigation.**

**Topic 9: Case Study.** An in-depth investigation into the methodology of case study research, including approaches and theories, development of goals, and current issues and challenges. Curriculum and Instruction 385G (Topic: Case Study Research) and 388R (Topic 9) may not both be counted.

### **EDC 389R. Topics in Advanced Mixed Methods Research.**

Instruction in design-based research, a methodology aimed to improve educational practices through interventions involving iterative analysis, design, and development, and implementation of interventions based on collaboration among researchers and practitioners in real-world settings. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; admission to a Doctor of Education or Doctor of Philosophy degree program; and Curriculum and Instruction 385R and 386R, or consent of instructor.

### **EDC 390T. Institute in Instruction.**

Various topics designed to help students analyze and improve instruction at one of the following levels: elementary school, secondary school, higher education, all-level. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Reading.**

**Topic 3: Science.**

**Topic 4: Social Studies.**

**Topic 5: Mathematics.**

**Topic 6: Foreign and Second Language Materials Development.**

Additional prerequisite: Consent of instructor.

**Topic 7: Advanced Instructional Systems Design.** Advanced topics, theoretical frameworks, and strategies for the design of instructional systems. Students work in teams to design and develop an instructional product for an authentic client such as a state agency, school system, university, corporation, or museum that meets specified criteria. Additional prerequisite: Curriculum and Instruction 390T (Topic 21: Instructional Systems Design).

**Topic 8: English as a Second Language.** Additional prerequisite: Consent of instructor.

**Topic 9: Bilingual Education.**

**Topic 10: Analysis of Teaching in Physical Education.** An examination of the history and current practices involved in high and low inference methods of analyzing teaching. Commonly used evaluation systems such as the Professional Development and Appraisal System (PDAS) and National Board Certification will be reviewed.

**Topic 11: Archaeology Education for Social Studies.**

**Topic 12: Childhood and Adolescent Literature.**

**Topic 13: Design for Technology Innovation.**

**Topic 15: Elementary School Curriculum.**

**Topic 16: English as a Second Language: Oral.**

**Topic 17: English as a Second Language: Literacy.**

**Topic 18: English as a Second Language: Reading.**

**Topic 19: Equity in Science, Technology, Engineering, and Mathematics Education.**

**Topic 20: Systemic Reform and Science and Mathematics Education.**

Curriculum and Instruction 385G (Topic: Systemic Reform and Science and Mathematics Education) and 390T (Topic 20) may not both be counted.

**Topic 21: Instructional Systems Design.** Provides an overview of the theoretical frameworks, current trends, and common concerns associated with the design and development of instructional materials. Investigates the theoretical, practical, and critical perspectives on instructional design as applicable in a variety of educational contexts (K-12 education, higher education, and corporate training) and modes (face-to-face, online, and hybrid environments). Includes readings, discussions, real-world design, practical applications, and interactions with instructional design experts.

**Topic 22: Improving Social Studies Education.**

**Topic 23: Instructional Telecommunications.**

**Topic 24: Introduction to Curriculum Studies.** Designed to familiarize doctoral students with the theoretical, philosophical, sociocultural, and practical areas within the field of curriculum study.

**Topic 25: Literature for Young Adults.**

**Topic 26: Multicultural Curriculum and Teaching.**

**Topic 27: The Planning and Management of Instructional Programs.**

**Topic 28: Practice in Reading Difficulties.** A practicum in assessing and teaching elementary school students who struggle with reading. Class meetings take place at a local elementary school and include one-on-one tutoring with coaching and modeling by the instructor, small group support sessions, and seminars on issues related to reading difficulties.

**Topic 29: Reading Difficulties.** Introduces history, theory, research, and policy related to reading difficulties in school-age children and critically examines existing programs designed to address the needs of students with reading difficulties. Students study and employ teaching strategies in the context of cases and/or a practicum experience.

**Topic 30: Research on Teaching.**

**Topic 31: Research on Teaching in Science, Technology, Engineering, and Mathematics Education.**

**Topic 32: Seminar in Elementary School Curriculum.**

**Topic 33: Studies in Curriculum and Instruction.**

**Topic 36: Humanities and Literacy in Social Education.**

**Topic 37: Systemic Reform in Science, Technology, Engineering, and Mathematics Education.** Covers the major themes of systemic reform in science, technology, engineering, and mathematics (STEM) education and explores, develops, and investigates models of reform initiatives. Additional prerequisite: Curriculum and Instruction 385G (Topic 59: Knowing and Learning in STEM Education); and credit or registration for Curriculum and Instruction 385G (Topic 42: Curriculum History in STEM Education).

**Topic 38: Advanced Topics in Science, Technology, Engineering, and Mathematics Education.** Focuses on a critical issue in science, technology, engineering, and mathematics (STEM) education aligned with STEM education faculty research interests, culminating in a product (paper, presentation, proposal) that can be submitted to professional or funding agencies. Additional prerequisite: Curriculum and Instruction 385G (Topic 59: Knowing and Learning in STEM Education) and 385G (Topic 42: Curriculum History and Development in STEM Education).

**Topic 39: Instructional Systems Design.** An overview of the theoretical frameworks, current trends, and common concerns associated with the design and development of instructional materials. The theoretical, practical, and critical perspectives on instructional design as it is applied in a variety of educational contexts will be reviewed for the purpose of designing effective and engaging learning experiences.

**Topic 40: Advanced Instructional Systems Design.** Includes advanced topics, theoretical frameworks, and strategies for the design of instructional systems. Students work in teams to design and develop an instructional product for an authentic client such as a state agency, school system, university, corporation, or museum that meets specified criteria for quality.

**Topic 41: Measurement and Assessment of Physical Activity.**

An introduction to theoretical bases for evaluating and investigating physical education teaching effectiveness. Emphasis is placed on current technologies and issues of assessment for physical education instruction, basic statistics concepts, and current educational evaluation trends. Designed primarily for physical education teachers.

**Topic 42: Research on Teaching in Physical Education.** An examination of past and current research on teaching, teachers, and curriculum in physical education. Empirical and conceptual scholarship related to the physical education teaching process, the preparation of teachers and their experiences, and the development of curriculum in physical education settings will be explored.

**Topic 43: Foundations of Learning Technology.** Introduces students to the field of learning technology by learning its history, as well as the learning theories, paradigms, thought leaders, trends, and issues that have shaped the field. Primarily web-based and involves both individual and collaborative work. Online class meetings will be held every two to three weeks to facilitate real-time discussions on the readings, as well as opportunities for interaction with visiting experts in the field. The equivalent of three lecture hours a week for one semester. Curriculum and Instruction 390T (Topic: Foundations of Learning Technology) and 390T (Topic 43) may not both be counted.

**EDC 392L. Philosophical Foundations of Education.**

Designed for master's degree students without previous graduate work in philosophy or philosophy of education and for doctoral students who need to update preparation. A systematic overview of the field of philosophy of education. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and either twelve semester hours of coursework in upper-division education or consent of instructor.

**EDC 196, 396. Doctoral Seminar.**

Research projects and creative investigations in a selected subject-field and developments in instructional practices and in research findings and methodologies. Offered at the following levels: elementary school, secondary school, higher education, all-level. The equivalent of one or three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and admission to candidacy for the doctoral degree or consent of instructor.

**Topic 1: Foreign Language.** Offered on the credit/no credit basis only.

**Topic 2: Social Studies Education.**

**Topic 3: Learning Technologies.**

**Topic 4: Cultural Studies in Education.**

**Topic 5: Early Childhood Education.**

**Topic 6: Bilingual/Bicultural Education.**

**Topic 7: Language and Literacy Studies.**

**Topic 8: Science, Technology, Engineering, and Mathematics Education.**

**Topic 9: Physical Education Teacher Education.**

**EDC 196T, 296T, 396T. Directed Research in Curriculum and Instruction.**

Investigation of assigned problems under the direction of a Graduate Studies Committee member; development and demonstration of competence in research design and execution; production of acceptably written reports of a technical character. The equivalent of one, two, or three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

**EDC 196V, 396V. Independent Study.**

May involve syntheses of literature, field investigations on selected topics, or other individual research topics. Conference course equivalent to one or three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and twelve semester hours of graduate education.

**EDC 197P, 397P, 697P. Graduate Internship.**

Supervised practice in a professional position. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and admission to approved internship program.

**Topic 1: Early Childhood Education.** Restricted to students in early childhood education.

**EDC 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in curriculum and instruction and consent of the supervising professor and the graduate adviser; for 698B, Curriculum and Instruction 698A.

**EDC 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in curriculum and instruction and consent of the graduate adviser.

**EDC 398T. Supervised Teaching in Curriculum and Instruction.**

Supervised college teaching experience. Three lecture hours a week for one semester. Prerequisite: Graduate standing and appointment as a teaching assistant or an assistant instructor.

**EDC 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

**EDC 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Curriculum and Instruction 399R, 699R, or 999R; approved dissertation proposal must be on file with the graduate adviser.

## Educational Administration

*Master of Education*

*Doctor of Philosophy*

*Doctor of Education*

## For More Information

**Campus address:** George I. Sánchez Building (SZB) 310, phone (512) 471-7551, fax (512) 471-5975; campus mail code: D5400

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Educational Administration, 1912 Speedway Stop D5400, Austin TX 78712

**URL:** <http://edadmin.edb.utexas.edu/>

## Facilities for Graduate Work

The University and the College of Education provide outstanding computer laboratories, instructional resource centers, and libraries.

Students are also encouraged to view the whole intellectual and cultural life of the University as a resource to be explored.

The Department of Educational Administration has close working relationships with public and private schools, colleges, and universities that provide clinical sites, field experiences, and research opportunities. Many educational associations and agencies in Austin provide important additional resources for students and faculty members.

## Areas of Specialization

Students may choose from three specializations: community college leadership, higher education leadership, and public school executive leadership, including the educational policy and planning program, and state certificates in principalship and superintendency. Although each specialization involves unique coursework, a common core of knowledge is required of all students.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Norma V Cantu	Soncia Reagins-Lilly
Mark Anthony Gooden	Richard J Reddick
Terrance L Green	Pedro Reyes
Jennifer J Holme	Victor B Saenz
Huriya Jabbar	Edwin R Sharpe Jr
Manuel J Justiz	Patricia A Somers
Marilyn C Kameen	Angela Valenzuela
Ruben D Olivarez	Gregory J Vincent
Barbara L Pazey	

## Admission Requirements

Admission decisions are based on multiple criteria, including the applicant's academic and professional qualifications. Applicants must submit an official score on the Graduate Record Examinations General Test and must have a grade point average of at least 3.00 in upper-division and graduate coursework. In addition, the applicant must be accepted into one of the areas of specialization listed above. The faculty for the specialization may establish additional admission requirements, such as participation in an assessment center, personal interviews, or other evidence of the student's preparation for graduate work. Information about these requirements is available from the department.

Students entering one of the doctoral programs should hold a master's degree or the equivalent. The master's degree need not be in education, but the applicant is expected to have knowledge of the history or philosophy of education and of human learning.

## Degree Requirements

### Master of Education

This is a professional degree offered in two areas of specialization—higher education leadership and public school executive leadership. In the public school executive leadership specialization, the master's degree is part of the state certification program. At least thirty-six semester hours of coursework are required, concentrated in one of the areas of specialization. Both specializations require at least twenty-one hours of approved coursework in the department and a minor of at least six hours outside the department. Of the nine hours of upper-division coursework that may be included in the program, no more than six may be in either the major or the minor.

## Doctor of Philosophy

Programs leading to this degree emphasize preparation for a research career in which the graduate will add to the core of knowledge in the fields of educational policy, leadership, and administration. Programs are oriented toward theory development and the development of research skills in a variety of methodologies and include a strong secondary emphasis in a cognate field. To be admitted to candidacy, a student must pass oral and written examinations both in core areas and in the area of specialization.

The student's program must consist of at least sixty semester hours of coursework at the University in addition to dissertation hours, including at least forty-two hours in the Department of Educational Administration. The student must be in residence as a full-time student for two consecutive semesters. Students may register for no more than fifteen hours each semester and for no more than six hours each six-week summer term.

All students must complete the following work; additional work may be required in some areas of specialization.

1. Fifteen hours in core areas that form the theoretical foundation for the study of administration. Core areas include educational economics and finance policy; educational politics and policy; ethics and values; organizational design and behavior; and social and cultural contexts of education.
2. Fifteen hours of coursework unique to the specialization.
3. Fifteen hours (the minor) outside the College of Education but in areas supporting the field of educational administration; nine hours must be in a single theme or discipline or must form an integrated sequence.
4. Twelve hours in research methods courses, including Educational Administration 381P, 381Q, and 387Q. Knowledge of basic statistics is prerequisite to some research methodology courses; this knowledge may be demonstrated by coursework (which may not be counted toward the doctoral degree) or by examination.
5. A research apprenticeship individually designed to provide each student with research experience in his or her area of specialization.
6. The candidate must enroll for two consecutive semesters in dissertation courses.

The focus of the dissertation must be in-depth, original research that has the possibility of creating new knowledge and understanding of a particular educational construct. In addition, the implications of the dissertation research should be much wider than a specific problem in a specific context.

The student may have one member of his or her dissertation committee who has no affiliation to the University. This individual must have a doctoral degree and may also be required to meet other conditions.

### Doctor of Education

Programs for this degree emphasize preparation for leadership careers in a variety of educational settings. Programs are oriented toward the application of theory and knowledge to practical problems and toward the development of sophisticated management skills and intelligent, informed leadership. To be admitted to candidacy, a student must pass oral and written examinations both in core areas and in the area of specialization.

The student's program must consist of at least fifty-seven semester hours of coursework at the University in addition to the treatise courses, including at least forty-two hours in the Department of Educational Administration. The student must be in residence as a full-time student for two consecutive semesters or a semester and a summer session.

Students may register for no more than fifteen hours each semester and for no more than six hours each six-week summer term.

All students must complete the following work; additional work may be required in some areas of specialization.

1. Twelve hours in core areas that form the theoretical foundation for the study of administration. Core areas include educational economics and finance policy; educational politics and policy; ethics and values; organizational design and behavior; and social and cultural contexts of education.
2. Twenty-four hours of coursework unique to the specialization.
3. Nine hours (the minor) outside the department but in areas supporting the field of educational administration.
4. Six hours in research methods courses, including Educational Administration 387Q and either 381P or 381Q. Knowledge of basic statistics is prerequisite to other research methodology courses. This knowledge may be demonstrated by coursework (which may not be counted toward the doctoral degree) or by examination.
5. One semester in an internship or practicum. The internship is individually designed to provide each student with on-site experience in the practice of educational leadership.
6. The candidate must enroll for two consecutive semesters in treatise courses.

The focus of the treatise must be on problems of practice and should address a specific problem or program in a given context. The treatise can examine a particular issue or evaluate a specific program in any educational institution.

The treatise committee must be comprised of five individuals. Two members, including the chair of the committee, must be members of the Graduate Studies Committee in the Department of Educational Administration. The third committee member must be a member of a Graduate Studies Committee from any other department within the University. The other two committee members must have no affiliation with the University. These individuals must each have doctoral degrees and have practical experience directly related to the proposed treatise. They may also be required to meet other conditions.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Educational Administration: EDA

#### **EDA 180F, 280F, 380F. Proseminar I: Introduction to Careers in Higher Education.**

Restricted to doctoral students in the Program of Higher Education Leadership. Foundation for cohort interaction among incoming doctoral students. Establishes a learning community among students and faculty to explore issues related to pre-k through twenty education with opportunities for team conferring, planning, academic research, relevant practical experiences and site visits, professional presenting, writing and analysis, and other curricular and career enhancement opportunities. For each semester hour of credit earned, one lecture hour a week for one semester. Prerequisite: Graduate standing.

#### **EDA 180S, 280S, 380S. Pro-seminar II: Introduction to Research in Higher Education.**

Restricted to doctoral students in the Program in Higher Education Leadership. Continuation of Educational Administration 180F, 280F, 380F. Explores research topics in higher education, with opportunities for team conferring, planning, academic research, relevant practical experiences and site visits, professional presenting, writing, and analysis. For each semester hour of credit earned, one lecture hour a week for one semester. Prerequisite: Graduate standing and registration for Educational Administration 391K (Topic 13).

#### **EDA 381K. Systems for Observing and Analyzing Instruction.**

Provides skill in systematic observation, organized ways of examining teacher/student behavior in the classroom. Incorporates Texas Teacher Assessment Seminar training. Three lecture hours a week for one semester, with laboratory hours to be arranged. Prerequisite: Graduate standing.

#### **EDA 381P. Quantitative Research Design and Analysis.**

Introduction to the knowledge base in measurement theory and quantitative research designs, including research designs appropriate to different research contexts; and analyzing, interpreting, and representing statistical data to scholarly and practitioner audiences. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Educational Psychology 371 or another introductory course in statistics, and Educational Administration 387Q or the equivalent.

#### **EDA 381Q. Qualitative Research Design.**

Introduction to the utilization of theoretical frames; research questions or focus, and literature reviews; ethical issues; research design; research methods; data analysis; representations of data; interpretation of data; trustworthiness; implications; and strengths and limitations in the conduct of qualitative research. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Educational Administration 387Q or the equivalent.

#### **EDA 381S. Advanced Qualitative Research.**

Examines in-depth exemplary qualitative studies and considers critical issues that have been raised in qualitative research. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Educational Administration 381Q and 387Q or their equivalents.

#### **EDA 381T. Interactive Qualitative Analysis.**

Introduction to a systems theory of qualitative research, Interactive Qualitative Analysis (IQA), and direct experience in an integrated approach to research design, data collection, analysis, representation, and interpretation. Case studies are used with each of the major stages of a qualitative study. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Educational Administration 381Q and 387Q or their equivalents.

#### **EDA 682G. Foundations in Educational Administration.**

A fused, multidisciplinary foundational core course covering major task areas, administrative theory and processes, and supporting knowledge from other disciplines. Six lecture hours a week for one semester. Some sections are offered on the credit/no credit basis only; these are identified in the Course Schedule. May be repeated for credit when the topics vary. Prerequisite: Graduate standing. Admission by application only.

**Topic 2: Community College Administration.** Examination of common forms of organization, governance, and administration including types of governing units, state-level coordination, local governing boards and models of district and college organization. Role



of administrators with various personnel issues such as dealing with unions, staff evaluations, etc.

#### **EDA 682H. Foundations in Educational Administration.**

A fused, multidisciplinary foundational core course covering major task areas, administrative theory and processes, and supporting knowledge from other disciplines. Six lecture hours a week for one semester. Some sections are offered on the credit/no credit basis only; these are identified in the Course Schedule. May be repeated for credit when the topics vary. Prerequisite: Graduate standing. Admission by application only.

##### **Topic 1: Public School Administration.**

#### **EDA 382M. Organizational Design and Behavior--Core Course.**

Theories of organization from structuralist, behaviorist, and critical traditions that are useful for diagnosing problems endemic to schools and colleges, and for developing skills necessary for administering complex educational systems. Study of concepts related to bureaucracy, organizational design, decision making, power and control, leadership, motivation, and organizational communication. Three lecture hours a week for one semester. Educational Administration 382M and 395 (Topic 7: Organizational Behavior and Decision Making) may not both be counted. Prerequisite: Graduate standing.

#### **EDA 382T. Administration of the Individual School.**

Organization, direction, management, and leadership for the program of a single school. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and admission to an approved internship program for administrator preparation.

##### **Topic 1: Elementary Schools.**

##### **Topic 2: Secondary Schools.**

#### **EDA 383, 683. Directed Advanced Studies.**

Group and individual studies of research literature; execution of investigative projects and reports of research. For 383, three lecture hours a week for one semester; for 683, the equivalent of six lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

##### **Topic 1: Individual Projects.**

##### **Topic 2: School-Community Relations.**

##### **Topic 3: Strategies of Educational Planning.**

##### **Topic 5: School Business Management.**

**Topic 6: Community College Programs.** Strategic and academic master planning, regional accreditation standards, overall program evaluation, effective evaluation of workforce programs, and emerging and innovative instructional models for enhancing student success.

##### **Topic 7: Special Topics in Administration and Supervision.**

##### **Topic 9: Special Topics in Educational Finance.**

##### **Topic 15: Principalship.**

##### **Topic 16: Americans with Disabilities.**

##### **Topic 17: Program Evaluation and Decision Making.**

**Topic 18: Data-Based Decision Making for Principals.** The effective use of data for educational improvement from the principal's perspective. Focus on how data better informs the improvement learning and educational practice.

**Topic 19: Data-Based Decision Making in Schools.** Examines the effective use of data for educational improvement at all levels of a school district. Includes achievement tests, demographics, discipline data, program information, parental information, student work projects, and educator judgment.

#### **EDA 683C. School Restructuring and Renewal.**

Critical examination of school restructuring, renewal research, and systemic change processes since 1975. Study and evaluation of school restructuring and renewal processes, and their underlying research bases, in conjunction with the influence patterns of teachers, principals, superintendents, school boards, parents, and state and national policy makers on the development and use of such concepts and processes. Six lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **EDA 384G. Seminar in Instructional Supervision.**

Systematic analysis of research and theory related to supervisory behavior in education. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **EDA 384L. Designing In-Service Education Programs.**

Designing, planning, evaluating, and directing in-service education and training for professional-level personnel. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **EDA 385, 685. Practicum in Instructional Supervision.**

For each semester hour of credit earned, one class hour a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisite for Educational Administration 385: Enrollment in an approved internship program.

##### **Topic 1: General, Elementary, and Secondary Programs.**

##### **Topic 2: Directing Instructional Services Programs.**

##### **Topic 3: Student Personnel Administration.**

##### **Topic 4: Practicum in Program Development.**

##### **Topic 5: Higher Education Administration.**

##### **Topic 6: School District Administrative Functions .**

#### **EDA 385C. School Improvement: Instructional Leadership and Development.**

Designed to provide prospective school leaders with the conceptual, technical, and human-interaction skills necessary for school improvement. Focus on knowledge, principles, problems, and issues related to instructional leadership. Examines instructional supervision theory, goals, functions, supervisory models, and strategies that enhance teaching and learning. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **EDA 685D. Instructional Leadership.**

An integrated, problem-based specialization course covering major instructional task areas. Emphasis on change process theory, innovative school reform, restructuring, and leadership theory and practice. Six lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### **EDA 387. The Community College.**

Evolution, role, and functions of the community college; patterns of organization; purposes and programs; current issues. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **EDA 387Q. Introduction to Systems of Human Inquiry.**

Designed for doctoral students. Introduction to the range of different epistemological perspectives that are used in the conduct of social science research, including the scientific method/positivism, postpositivism, interpretivism, postmodernism, critical theory, race-based and culture-based perspectives, and feminisms. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 388E. Educational Economics and Finance Policy--Core Course.**

Survey of the theoretical and empirical literature related to the economic context of and finance policy within K-12 or higher education institutions. Separate K-12 and higher education sections are taught. Covers a wide range of concepts, processes, and policies, such as patterns of financing educational institutions; federal, state, and local governmental roles; revenue sources; costs; benefits; equity; efficiency; budgeting; and finance policy implementation. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 388L. School Law.**

Legal bases for organizing and administering public and private school systems; statutes and court decisions affecting educational functions; administrative legal issues pertaining to various functions of school districts. This course may be offered with a restriction to Cooperative Superintendent Fellows. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 388M. Social and Cultural Contexts of Education--Core Course.**

The relationship of contemporary educational institutions, both public school and higher education, to their social setting. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 388P. Educational Politics and Policy--Core Course.**

Survey of theoretical and empirical literature related to educational politics and policy concerning K-12 or higher education institutions, including political systems theory, intergovernmental relations, power and conflict, community relations and intergroup theory, and policies dealing with equity, quality, efficiency, and choice. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 388S. A Comprehensive Exploration of P-16 Education.**

Issues related to an educational system that integrates the student experience from preschool through a four-year college degree. Three lecture hours a week for one semester. Prerequisite: Graduate standing and admission to the doctoral program in educational administration.

**EDA 388V. Ethics and Values in Educational Administration--Core Course.**

Examination, from the point of view of various ethical systems, of issues of equity, distributive justice, codes of ethics in educational professions, treatment of students, and other issues that face administrators of educational systems. Designed to sensitize prospective educational leaders to the ethical content of educational decisions. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 391C. Comparative Higher Education.**

Examination of the higher education systems and institutions of selected countries. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 391D. Institutional Research and Planning.**

Study of the ways planning and governance are informed by data collection, analysis, and information-use strategies in order to improve institutions of higher education. Institutional research and planning functions in colleges and universities. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 391E. The College Student.**

Study of the student population in contemporary colleges and universities, with emphasis on student development theory and the impact of campus

environments on student development. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 391F. Capstone: Advanced Issues in Higher Education.**

Designed as a capstone experience for doctoral students in the Program in Higher Education Leadership. Examines current issues in higher education from a practical and administrative perspective. Students select, prepare, and present an integrated review of the research literature on a higher education topic of their choosing. The final individual project includes a critical synthesis of the research literature in the student's chosen topic area, a written project designed to demonstrate the student's breadth of understanding of higher education research. Three lecture hours a week for one semester. Prerequisite: Graduate standing and completion of all required coursework in the student's doctoral specialization.

**EDA 391G. Administrative Leadership in Higher Education.**

Examination of executive leadership in institutions of higher education. Includes consideration of roles, responsibilities, styles, and differences in more than one organizational context. Some consideration given to selection, replacement, training, guidance, development, and evaluation of leaders. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and completion of at least two semesters of doctoral coursework in educational administration or consent of instructor.

**EDA 391J. Policy and Policy Development in Higher Education.**

Designed to enhance the student's understanding of policy as a concept, policy responsibilities of leadership, and policy development in higher education through formulating and refining institutional policy responses to select issues. Strong focus on critical thinking and policy writing skills. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and admission to the doctoral program in educational administration or consent of instructor. Educational Administration 388P is recommended but not required.

**EDA 391K. Administration in Institutions of Higher Education.**

Administrative organization, functions, and practices within colleges and universities; roles of the administrator and principles of effective administrative practice; intensive study in selected areas of college operation. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Community Colleges.** History of the values, purpose, and mission of community colleges, with an overview of major functions such as transfers, workforce development, adult basic education, and continuing education. Explores various models of community college governance, funding sources, and alternative funding models.

**Topic 11: Curriculum Planning and Administration in Higher Education.**

**Topic 13: Instructional Leadership.** Leadership theories and models, with an emphasis on how theory can inform the practice of leadership. An exploration of approaches to leadership and how to further develop leadership skills. Strategies for effective community college advocacy at the local, state, and national level. Additional prerequisite: Registration for Educational Administration 395 (Topic 7: Higher Education Futures and Issues).

**Topic 14: The American Professorate and Academic Administration.**

**Topic 15: Gender in Higher Education.**

**Topic 16: Statewide Planning in Higher Education.**

**Topic 17: Equity and Access in Higher Education.**

**Topic 18: Student Affairs Assessment in Higher Education.**

**Topic 19: Legislative Issues in Higher Education.**

**Topic 20: Research on College Students.**

**Topic 21: Risk Management in Student Affairs.**

**Topic 22: Adolescent and College Student Development Theory.**

**EDA 391P. College Student Personnel Administration.**

An examination of the rationale for student personnel programs and the various administrative units involved in carrying out their mission. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 391Q. Contemporary Issues In Higher Education Management.**

An examination of responsibilities, functions, challenges, and current issues that affect managers in institutions of higher education. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 391R. Organization and Administration of Higher Education.**

Introduction to the study of higher education. Analysis of all elements of higher education institutions, with particular attention to structure and governance. Three lecture hours a week for one semester. Educational Administration 391K (Topic 5: Organization and Administration of Higher Education) and 391R may not both be counted. Prerequisite: Graduate standing.

**EDA 391S. History of Higher Education.**

The development of higher education since the Middle Ages, with emphasis on the development of higher education in the United States. Three lecture hours a week for one semester. Educational Administration 383 (Topic 10: History of Higher Education) and 391S may not both be counted. Prerequisite: Graduate standing.

**EDA 391T. Higher Education Law.**

Legal principles relevant to postsecondary institutions. Emphasis on statutes and cases applicable to both public and private institutions; interpretation and compliance. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 393D. Law and Disabilities.**

Issues of law and policy associated with serving people with disabilities, with emphasis on federal legislation. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 393E. Education Futures.**

Technological forecasting methods as a basis for long-range planning in school organizations. The effects of demographic trends and alternative future scenarios on educational objectives and strategies. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 394P. Personnel Administration: Managing Instructional Resources.**

Functions of school personnel offices. Topics include development of personnel administration; job descriptions; planning for personnel needs; recruitment, selection, and evaluation of personnel; and management of the personnel office. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 395, 695. Topical Seminar.**

For each semester hour of credit earned, the equivalent of one class hour a week for one semester. Educational Administration 195 and 197N may not both be counted. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**EDA 395D. Special Populations.**

Designed to provide students with knowledge and skills needed to address the "equal opportunity to learn" needs of special populations and

the programs that serve them. Also addresses what educational leaders need to know in order to be effective advocates for appropriate services to special populations. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 395E. Class, Gender, and Race in Schools.**

The problem of the public educational system's delivery of unequal academic results to students of different classes, genders, and races. Focus on a comprehensive, research-based understanding of educational inequities and on methods to develop schools that give all students an equal opportunity for academic achievement. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 395F. Foundations of Educational Policy.**

Introduction to the history of the American educational system. Considers historical, economic, social, and political precedents when examining contemporary educational policy. Emphasis on policies related to race, ethnicity, class, and gender, and the recurring nature of controversial issues related to language, segregation, funding, and accountability. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 395G. Policy Implementation Seminar.**

Examines the challenges and implementation of systemic school reform in the context of American cities. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 395H. Policy Issues in Data-Based Decision Making.**

Policy issues, research, and theory surrounding effective educational data use that positively impacts educational improvement, practice, and student learning. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 395J. Poverty and Education Policy.**

The social context of education, the development and expansion of concentrated poverty in central-city schools, and the relationship between poverty and educational performance as it affects schoolchildren and parents in closely related fields such as welfare, housing, employment and training, health care, food assistance, and day care. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 395K. Policy Research Problems.**

Advanced doctoral seminar designed to help students develop research plans specifically for either a research proposal or a long-range research agenda. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 395L. Advanced Policy Seminar in Latino Education Issues.**

Policy issues experienced by Latinos in the United States. Issues include testing, English as a Second Language programs, and bilingual education. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 395M. Critical Policy Analysis.**

The analysis of policy, including traditional and critical approaches. Reviews methods and principles of policy analysis, the role of policy development, context, history, and micropolitical influences. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**EDA 196, 296, 396. Research Apprenticeship.**

For doctoral students. Group and individual projects in research design, research methodologies, and research execution. One, two, or three

lecture hours a week for one semester. Prerequisite: Graduate standing, preparation satisfactory to instructor, and consent of the graduate adviser.

#### **EDA 396R. Dissertation Seminar.**

Intensive examination of selected dissertation topics, issues of framing research problems, methodology of educational inquiry, and application of theoretical perspectives. Student reports on current research and panel discussions on significant issues in the study of education. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### **EDA 396T. Directed Research in Educational Administration.**

Investigation of assigned problems under direction of a Graduate Studies Committee member; development and demonstration of competence in research design and execution; production of acceptably written reports of a technical character. Conference course. May be repeated for credit by doctoral students. Prerequisite: Graduate standing and consent of the graduate adviser.

#### **EDA 197N. Principalship Internship.**

The equivalent of one lecture hour a week for one semester. Educational Administration 195 and 197N may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and enrollment in the principalship program in educational administration.

#### **EDA 397P, 697P, 997P. Graduate Internship.**

Supervised practice in a professional position. For each semester hour of credit earned, one lecture hour a week for one semester. With consent of the graduate adviser, may be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and admission by internship committee.

#### **EDA 397Q, 697Q, 997Q. Graduate Internship.**

Supervised practice in a professional position. For each semester hour of credit earned, one lecture hour a week for one semester. With consent of the graduate adviser, may be repeated for credit. Offered on the letter-grade basis only.

#### **EDA 399K, 699K, 999K. Treatise.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree. Prior to registering, students must obtain University of Texas at Austin Institutional Review Board approval for research involving human subjects.

#### **EDA 399L, 699L, 999L. Treatise.**

Offered on the credit/no credit basis only. Prerequisite: Educational Administration 399K, 699K, or 999K.

#### **EDA 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree. Prior to registering, students must obtain University of Texas at Austin Institutional Review Board approval for research involving human subjects.

#### **EDA 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Educational Administration 399R, 699R, or 999R.

## **Educational Psychology**

*Master of Arts  
Master of Education  
Doctor of Philosophy*

## **For More Information**

**Campus address:** George I. Sánchez Building (SZB) 504, phone (512) 471-4155, fax (512) 471-1288; campus mail code: D5800

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Educational Psychology, 1912 Speedway Stop D5800, Austin TX 78712-1289

**E-mail:** edpsych@teachnet.edb.utexas.edu

**URL:** <http://www.edb.utexas.edu/education/departments/edp/>

## **Facilities for Graduate Work**

Facilities for graduate study include an extensive library developed specifically for education and psychology; the College of Education's Learning Technology Center; the Educational Psychology Training and Research Area; Counseling, Learning, and Career Services; and state and community institutions as well as agencies in Austin for training and research.

## **Areas of Study**

Professional training in educational psychology relates human cognition affect and behavior to the educational process as it occurs in the home, in peer groups, in nursery school through graduate school, in professional education, in business and industry, in the military, and in other settings. In so doing, it includes study in the following areas: the biological bases of behavior; history and systems of psychology and of education; the psychological processes related to diversity and multicultural issues; the psychology of learning, motivation, cognition, and instruction; human development, culture, and learning sciences (developmental, social, and personality psychology); psychological and educational measurement, statistics, evaluation, and research methodology; and the professional areas of school psychology, counseling psychology, and counselor education, including clinical training in those areas.

## **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Ricardo C Ainslie	Timothy Z Keith
Greg Allen	Christopher J McCarthy
Germine H Awad	Kristin Neff
Sarah K Bearman	Erika Alisha Patall
Keisha L Bentley-Edwards	Keenan A Pituch
Susan N Beretvas	James E Pustejovsky
Andrew C Butler	Aaron B Rochlen
Cindy I Carlson	Erin M Rodriguez
Jodi M Casabianca	Stephanie S Rude
Stephanie W Cawthon	Delida Sanchez
Kevin O Cokley	Diane L Schallert
Barbara G Dodd	Kevin D Stark
David J Drum	Marie-Anne P Suizzo
Toni L Falbo	Tiffany A Whittaker

## **Degree Requirements**

### **Master of Arts**

The Master of Arts degree in educational psychology is available to students with specializations in human development, culture, and learning sciences; school psychology; and counselor education. It is also available to students enrolled in the Doctor of Philosophy degree program who wish to complete a master's degree on the way to the doctorate or who are

allowed by the Graduate Studies Committee to elect a terminal master's degree.

A minimum of twelve semester hours of upper-division coursework in psychology or educational psychology, or an appropriate equivalent, is a prerequisite for the degree. Further information about requirements and optional plans is available from the graduate adviser in educational psychology.

## Master of Education

This degree is available to students with specializations in human development, culture, and learning sciences; quantitative methods; and counselor education (those fulfilling the requirements for a certificate as a school counselor or those intending to be counselors in postsecondary education settings).

A minimum of twelve semester hours of upper-division coursework in psychology or educational psychology, or an appropriate equivalent, is a prerequisite for the degree. Further information about requirements and optional plans is available from the graduate adviser in educational psychology.

## Doctor of Philosophy

The student applying for admission to candidacy must follow coursework and other requirements that have been set by the Graduate Studies Committee and must pass such oral and written examinations as the committee may specify.

Most students require at least four years beyond the bachelor's degree to complete the program, including an internship; many take five years or more. A significant proportion of students in programs not requiring an internship can complete the program in four to five years, including summer sessions. Further information about requirements is available from the graduate adviser in educational psychology.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Educational Psychology: EDP

#### EDP 380C. Quantitative Methods.

Theory, models, methods, and applications of quantitative methods used in applied research. Three lecture hours a week for one semester, with additional hours to be arranged. Educational Psychology 380C and 182K, 282K, 382K, 482K may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of the adviser in the student's area of specialization; additional prerequisites vary with the topic.

**Topic 2: Fundamental Statistics.** Introductory course designed for students in the fields of education and the social, behavioral, and health sciences who expect to take a second course in statistics. Subjects include descriptive and inferential statistics; sampling distributions; hypothesis testing; correlation; linear prediction; tests of mean differences; tests of frequencies and proportions; and one-way analysis of variance. Educational Psychology 380C (Topic 2) and 180E

(Topic 1), 280E (Topic 1), 380E (Topic 1) may not both be counted. Offered on the letter-grade basis only.

**Topic 4: Correlation and Regression Methods.** Examines tests of association; multiple regression, including multiple predictors of a single interval-scaled outcome; and related subjects such as regression models for mediation and moderation. Educational Psychology 380C (Topic 4) and Educational Psychology 182K (Topic 2), 282K (Topic 2), 382K (Topic 2), 482K (Topic 2) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 380C (Topic 2), (or 180E (Topic 1), 280E (Topic 1), 380E (Topic 1)), or consent of instructor.

**Topic 6: Statistical Analysis for Experimental Data.** Subjects include hypothesis tests and data analysis procedures for a variety of experimental designs, including one-way analysis of variance; factorial analysis of variance; analysis of covariance; and repeated measures designs. Instruction in the use of statistical software is provided. Three lecture hours per week for one semester with additional hours to be arranged. Educational Psychology 380C (Topic 6) and 182K (Topic 1: Experimental Design and Statistical Inference), 282K (Topic 1: Experimental Design and Statistical Inference), 382K (Topic 1: Experimental Design and Statistical Inference), or 482K (Topic 1: Experimental Design and Statistical Inference) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 380C (Topic 2), (or 180E (Topic 1), 280E (Topic 1), 380E (Topic 1)), or consent of instructor.

**Topic 8: Data Analysis Using SAS.** Creating and modifying Statistical Analysis Systems (SAS) data sets using Data Step programming; managing a system of SAS data sets; and invoking SAS procedures using the PROC Step. Educational Psychology 380C (Topic 8) and 184 (Topic 6), 284 (Topic 6), or 384 (Topic 6), may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 380C (Topic 6 (Statistical Analysis for Experimental Data)), (or 182K (Topic 1: Experimental Design and Statistical Inference), 282K (Topic 1: Experimental Design and Statistical Inference), 382K (Topic 1: Experimental Design and Statistical Inference), 482K (Topic 1: Experimental Design and Statistical Inference)), or consent of instructor.

**Topic 10: Factor Analysis.** Exploratory and confirmatory factor analysis models; elementary matrix algebra; basic formulae for common factor analysis and principal components analysis; factor extraction methods; rotation models; criteria for analytical orthogonal and oblique rotation; interpretation of factors; calculation of factor scores; use of computer programs; and tests of model fit. Educational Psychology 380C (Topic 10) and 182K (Topic 3), 282K (Topic 3), 382K (Topic 3), 482K (Topic 3) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 380C (Topic 4) (or 182K (Topic 2), 282K (Topic 2), 382K (Topic 2), 482K (Topic 2)) and 380D (Topic 4) (or 180P (Topic 2), 280P (Topic 2), 380P (Topic 2), 480P (Topic 2)), or consent of instructor.

**Topic 12: Survey of Multivariate Methods.** Fundamentals of vector and matrix algebra; multivariate analysis of variance; principal components analysis and exploratory factor analysis; discriminant analysis; and logistic regression. Educational Psychology 380C (Topic 12) and Educational Psychology 182K (Topic 4), 282K (Topic 4), 382K (Topic 4), 482K (Topic 4) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 380C (Topic 4) (or 182K (Topic 2), 282K (Topic 2), 382K (Topic 2), 482K (Topic 2)) and Educational Psychology 380C (Topic 6) (or 182K (Topic 1: Experimental Design and Statistical Inference), 282K (Topic 1: Experimental Design and Statistical Inference), 382K (Topic 1: Experimental Design and Statistical Inference), 482K (Topic 1: Experimental Design and Statistical Inference)), or consent of instructor.

**Topic 14: Structural Equation Modeling.** Provides the basic theoretical background necessary for the application of structural

equation modeling to research problems including model specification, identification, path analysis, estimation, testing fit, respecification, confirmatory factor analysis, and issues concerning the interpretation of structural equation models. Educational Psychology 380C (Topic 14) and 182K (Topic 6), 282K (Topic 6), 382K (Topic 6), 482K (Topic 6) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 380C (Topic 12), (or 182K (Topic 4), 282K (Topic 4), 382K (Topic 4), 482K (Topic 4)), or consent of instructor.

**Topic 16: Hierarchical Linear Modeling.** Introduction to the basic concepts and applications of hierarchical linear models. Subjects include applications in contextual analysis, growth curve modeling, meta-analysis, and multilevel models for dichotomous outcomes. Educational Psychology 380C (Topic 16) and 184 (Topic 16), 284 (Topic 16), 384 (Topic 16) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 380C (Topic 4) (or 182K (Topic 2), 282K (Topic 2), 382K (Topic 2), 482K (Topic 2)); and 380C (Topic 6) (or 184 (Topic 6: Data Analysis Using SAS), 284 (Topic 6: Data Analysis Using SAS), 384 (Topic 6: Data Analysis Using SAS)); or consent of instructor.

**Topic 18: Applied Bayesian Analysis.** Practical introduction to Bayesian statistical inference with an emphasis on applications in behavioral and measurement research. Subjects include the conceptual differences between Bayesian and classical statistical inference and the differences between these approaches in the context of statistical procedures. Educational Psychology 380C (Topic 18) and 182K (Topic 10), 282K (Topic 10), 382K (Topic 10), 482K (Topic 10) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 380C (Topic 4) (or 182K (Topic 2), 282K (Topic 2), 382K (Topic 2), 482K (Topic 2)); and 380C (Topic 6) (or 182K (Topic 1: Experimental Design and Statistical Inference), 282K (Topic 1: Experimental Design and Statistical Inference), 382K (Topic 1: Experimental Design and Statistical Inference), 482K (Topic 1: Experimental Design and Statistical Inference)); or consent of instructor.

**Topic 20: Data Analysis and Simulation in R.** Introduces the R language and statistical computing environment, with a focus on using R for real-life empirical data analysis projects and simulation studies. Part I: reading in, cleaning, merging, and re-shaping data; creating information-dense graphics; running regressions, mixed models, etc. and using the results; reproducible data analysis. Part II: the logic of statistical simulation; using R to design, run, and analyze simulation studies. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 380C (Topic 6) (or 182K (Topic 1: Experimental Design and Statistical Inference), 282K (Topic 1: Experimental Design and Statistical Inference), 382K (Topic 1: Experimental Design and Statistical Inference), 482K (Topic 1: Experimental Design and Statistical Inference)), or consent of instructor.

**Topic 22: Analysis of Categorical Data.** Educational Psychology 380C (Topic 22) and 182K (Topic 5), 282K (Topic 5), 382K (Topic 5), 482K (Topic 5) may not both be counted. Offered on the letter-grade basis only.

**Topic 23: Missing Data Analysis.** An overview of the problem of missing data that is common to social science research. Subjects include patterns and mechanisms of missing data, conventional and modern missing data treatments, including maximum likelihood and multiple imputation, and reporting results from a missing data analysis. Missing data treatments are applied to various statistical models, such as multiple regression and factor analysis. Statistical software applications are included. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 380C (Topic 12), (or 182K (Topic 4), 282K (Topic 4), 382K (Topic 4), 482K (Topic 4)), or consent of instructor.

## **EDP 380D. Psychometrics.**

Theory, models, methods, and applications in psychometrics and program evaluation. Three lecture hours per weeks with additional hours to be arranged. Educational Psychology 380D and 180P, 280P, 380P, 480P may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of the adviser in the student's area of specialization.

**Topic 2: Measurement and Evaluation.** A basic background in measurement and evaluation is necessary to be appropriately critical of tests and instruments that are used in educational and psychological measurement situations. Subjects include general principles and basic concepts; types of reliability and validity; and the use of psychometric principles in various testing areas, such as intelligence testing; special aptitudes and abilities; educational achievement; and non-cognitive characteristics. Educational Psychology 380D (Topic 2) and 180P (Topic 1), 280P (Topic 1), 380P (Topic 1), 480P (Topic 1) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Twelve semester hours of upper-division coursework in education, psychology, or other behavioral sciences.

**Topic 4: Psychometric Theory and Methods.** Subjects include mental test theory and methods (including the classical true-score model, item response theory models, and test construction methods); an introduction to factor analysis; and psychological scaling theory and procedures. Educational Psychology 380D (Topic 4) and 180P (Topic 2), 280P (Topic 2), 380P (Topic 2), 480P (Topic 2) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 380C (Topic 2) (or 180E (Topic 1), 280E (Topic 1), 380E (Topic 1)) and Educational Psychology 380D (Topic 2) (or 180P (Topic 1), 280P (Topic 1), 380P (Topic 1), 480P (Topic 1)), or consent of instructor.

**Topic 6: Program Evaluation Models and Techniques.** Subjects include background and theory (including classical test theory, objectivity in mental measurement, dichotomous and polytomous models, conventional item analysis versus the item response theory approach, item parameter and ability estimation, and information functions), and applications (including relative efficiency of tests, flexilevel and two-stage tests, computerized adaptive tests and mastery tests, test equating, differential item functioning, and attitude and personality measurement). Educational Psychology 380D (Topic 6) and 180P (Topic 4: Evaluation Models and Techniques), 280P (Topic 4: Evaluation Models and Techniques), 380P (Topic 4: Evaluation Models and Techniques), 480P (Topic 4: Evaluation Models and Techniques) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 380C (Topic 2) (or 180E (Topic 1), 280E (Topic 1), 380E (Topic 1), 480E (Topic 1)), or consent of instructor.

**Topic 8: Item Response Theory.** Subjects include background and theory (including classical test theory, objectivity in mental measurement, dichotomous and polytomous models, conventional item analysis versus the item response theory approach, item parameter and ability estimation, and information functions), and applications (including relative efficiency of tests, flexilevel and two-stage tests, computerized adaptive tests and mastery tests, test equating, differential item functioning, and attitude and personality measurement). Educational Psychology 380D (Topic 8) and 180P (Topic 6), 280P (Topic 6), 380P (Topic 6), 480P (Topic 6) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 380D (Topic 4) (or 180P (Topic 2), 280P (Topic 2), 380P (Topic 2), 480P (Topic 2)), or consent of instructor.

**Topic 10: Test and Scale Construction.** Design of effective instruments and cognitive tests; facet theory for scale construction; measurement of opinions and beliefs; tryout of experimental forms

and item analysis; use of factor analysis and multidimensional scaling; norms and scaled scores; reliability and validity assessment; and test equating methods. Educational Psychology 380D (Topic 10) and Educational Psychology 180P (Topic 8), 280P (Topic 8), 380P (Topic 8), 480P (Topic 8) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 380D (Topic 4), (or Educational Psychology 180P (Topic 2), 280P (Topic 2), 380P (Topic 2), 480P (Topic 2)), or consent of instructor.

**Topic 12: Computer-Based Testing.** In-depth examination of computer-based testing (CBT) systems based on item response theory (IRT) models, including cases where the items are scored either right or wrong and cases where items are scored using more than two categories. Subjects include data simulation procedures; estimation of item and person parameters; item banking techniques; components of CBT algorithms; and issues concerning reliability, validity, and score reporting. Educational Psychology 380D (Topic 12) and Educational Psychology 180P (Topic 13), 280P (Topic 13), 380P (Topic 13), 480P (Topic 13) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 380D (Topic 8) (or 180P (Topic 6), 280P (Topic 6), 380P (Topic 6), 480P (Topic 6)), or consent of instructor.

**Topic 14: Applied Psychometrics.** In-depth examination of applied psychometric techniques. Subjects include equating scores; setting standards; detecting differential item functioning and selection, placement, and classification. Educational Psychology 380D (Topic 14) and Educational Psychology 180P (Topic 14), 280P (Topic 14), 380P (Topic 14), 480P (Topic 14) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 380D (Topic 4) (or 180P (Topic 2), 280P (Topic 2), 380P (Topic 2), 480P (Topic 2)), or consent of instructor.

**Topic 16: Advanced Psychometrics Seminar.** Educational Psychology 380D (Topic 16) and 180P (Topic 9), 280P (Topic 9), 380P (Topic 9), 480P (Topic 9) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 380D (Topic 4) (or 180P (Topic 2), 280P (Topic 2), 380P (Topic 2), 480P (Topic 2)), or consent of instructor.

**Topic 18: Advanced Psychometrics Research.** Educational Psychology 380D (Topic 18) and 180P (Topic 15), 280P (Topic 15), 380P (Topic 15), 480P (Topic 15) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 380D (Topic 4) (or 180P (Topic 2), 280P (Topic 2), 380P (Topic 2), 480P (Topic 2)), or consent of instructor.

### **EDP 380Q. Practicum in Psychometrics.**

Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only.

### **EDP 381C. Research Methodology.**

Theories and models for educational and psychological research. Three lecture hours a week for one semester with additional hours to be arranged. Educational Psychology 381C and 184, 284, 384 may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing; twelve semester hours of upper-division coursework in education or behavioral science, including an adequate background in statistics; and consent of the adviser in the student's area of specialization.

**Topic 2: Research Design and Methods for Psychology and Education.** Overview of research designs and methods used in behavioral sciences. Subjects include the philosophy of science, issues of validity and reliability, sampling, descriptive research, experimental and quasi-experimental designs, and qualitative research. Educational Psychology 381C (Topic 2) and 184 (Topic 24), 284 (Topic 24), 384 (Topic 24) may not both be counted. Offered on the letter-grade basis

only. Additional prerequisite: Educational Psychology 380C (Topic 4) (or 182K (Topic 2), 282K (Topic 2), 382K (Topic 2), 482K (Topic 2)), or consent of instructor.

**Topic 4: Research Methodology for Practitioners.** Designed to facilitate understanding of research methods and statistical analysis. Overviews development of needs assessment, program evaluation, and program modifications. Facilitates skills in critically evaluating research to select evidence-based approaches for practice settings. Educational Psychology 381C (Topic 4) and 184 (Topic 20), 284 (Topic 20), 384 (Topic 20) may not both be counted. Offered on the letter-grade basis only.

**Topic 6: Literature and Research Synthesis.** Focuses on the creation of a literature review or systematic research synthesis. Subjects to be covered include: problem formation; how research is communicated and how the scientific communication system affects knowledge; methods for locating research; problems in retrieving data from secondary sources; judging the quality of research; estimating the impact of policies and practices and gauging the strength of relations; and assessing variance in impacts and relationships across studies. Educational Psychology 381C (Topic 6) and 184 (Topic 22), 284 (Topic 22), 384 (Topic 22) may not both be counted. Offered on the letter-grade basis only.

**Topic 8: Qualitative Research Methods.** Examines research methods that are descriptive, field-based, interpretive, and discovery-focused. Subjects include the varieties of qualitative research; identifying questions and phenomena for research; planning and conducting qualitative research; coding and other analytic procedures; developing an interpretation; and trustworthiness issues in qualitative inquiry. Educational Psychology 381C (Topic 8) and 184 (Topic 8), 284 (Topic 8), 384 (Topic 8) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 380C (Topic 2) (or 180E (Topic 1), 280E (Topic 1), 380E (Topic 1)), or consent of instructor.

**Topic 10: Issues in Multicultural Research.** Designed to provide knowledge and tools to critique and evaluate theoretical, conceptual, and methodological issues related to the role and importance of culture, ethnicity, and race in multicultural research. Draws from social, developmental, counseling, and clinical psychology research, and emphasizes the challenges in conducting rigorous, culturally sound research. Educational Psychology 381C (Topic 10) and 184 (Topic 17), 284 (Topic 17), 384 (Topic 17) may not both be counted. Offered on the letter-grade basis only.

**Topic 12: Meta-analysis.** Effect size calculation for different designs; quantitative methods and models for synthesizing and testing moderators of effect size; and related subject matter. Three lecture hours per week with additional hours to be arranged. Educational Psychology 381C (Topic 12) and 184 (Topic 7), 284 (Topic 7), 384 (Topic 7) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 380C (Topic 4) (or 182K (Topic 2), 282K (Topic 2), 382K (Topic 2), 482K (Topic 2)) and Educational Psychology 380C (Topic 6) or consent of instructor.

**Topic 14: Causal Inference.** Survey of quantitative methods for studying causal effect of interventions, with emphasis on data analysis and interpretation. Subjects include potential outcomes models, graphical models, randomized experiments, propensity scores, matching and weighting, instrumental variables, interrupted time series, regression discontinuities, and mediation models. Educational Psychology 381C (Topic 14) and 184 (Topic 25), 284 (Topic 25), 384 (Topic 25) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 381C (Topic 2) (or 184 (Topic 24), 284 (Topic 24), 384 (Topic 24)).

**Topic 16: Survey Research Design.** Educational Psychology 381C (Topic 16) and 184 (Topic 7), 284 (Topic 7), 384 (Topic 7) may not both be counted. Offered on the letter-grade basis only.

### **EDP 381D. Advanced Statistical Modeling.**

Advanced course intended for doctoral students specializing in quantitative methods. Subject matter includes extensions of basic two- and three-level multilevel models and of structural equation models; simulation study design; and related subjects. Three lecture hours a week for one semester. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing; Educational Psychology 380C (Topic 14) (or Educational Psychology 182K (Topic 6), 282K (Topic 6), 382K (Topic 6), 482K (Topic 6)) and 380C (Topic 16) (or 184 (Topic 16), 284 (Topic 16), 384 (Topic 16)), or consent of instructor.

### **EDP 381E. Advanced Item Response Theory.**

Advanced course intended for doctoral students specializing in quantitative methods. Subjects include extensions of Item Response Theory (IRT) models, including multidimensional IRT and Testlet Response Theory, explanatory item response modeling, IRT rater models, cognitive diagnostic IRT models, response time models, and related subjects. Three lecture hours a week for one semester. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing; Educational Psychology 380C (Topic 16) (or 184 (Topic 16), 284 (Topic 16), 384 (Topic 16) and 380D (Topic 8) (or 180P (Topic 17), 280P (Topic 17), 380P (Topic 17), 480P (Topic 17)), or consent of instructor.

### **EDP 381Q. Practicum in Research Evaluation and Methodology.**

Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **EDP 382C. Social Psychology and Behavioral Sciences in Education.**

Examination of issues, theories, and research in selected areas of social psychology and other behavioral sciences that have implications for education. Social psychology is the study of how individuals are influenced by others. Behavioral sciences examines the interaction of cognitive processes and social environment, including social relationships. Three lecture hours a week for one semester. Educational Psychology 381M and 382C may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate Standing.

**Topic 2: Social Psychology.** Basic theories and methods of social psychology. Subjects include models of agency, self-deception, social comparison theory, positivity biases, accuracy in self-knowledge, diversity, loose versus tight cultures, sibling status, family relations, and family resources. Educational Psychology 381M (Topic 2) and 382C (Topic 2) may not both be counted. Offered on the letter-grade basis only.

**Topic 4: Families and Education in Three Cultures.** Highlights the similarities and differences between United States, Chinese, and Japanese societies, specifically in terms of the interaction between family and schools in educating children. Subjects include: tiger mothers, helicopter parents, respect for teachers, cultural views of individual differences, and the relative importance of effort versus ability. Educational Psychology 381M (Topic 6) and 382C (Topic 4) may not both be counted. Offered on the letter-grade basis only.

**Topic 6: Psychology of Race, Prejudice, and Stereotypes.** Studies the history and evolution of race, prejudice, and stereotyping from a social psychological perspective. Focuses on understanding the psychology of racial attitudes, prejudice, and stereotyping. Includes related ideas from the areas of anthropology, sociology, and biology. Educational Psychology 381M (Topic 12) and 382C (Topic 6) may not both be counted. Offered on the letter-grade basis only.

### **EDP 382D. Learning and Motivation.**

History and systems of psychology applied to education; modern theories and current research in learning and human motivation, especially in relation to new educational media and to the educative process. Three lecture hours a week for one semester. Educational Psychology 382D and 382L may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing; twelve semester hours of upper-division coursework in educational psychology and/or psychology; and consent of the adviser in the student's area of specialization.

**Topic 2: History and Systems of Psychology.** Overview of the major theoretical frameworks in psychology and its antecedents as a scientific field. Includes discussion of influential ideas, the people behind them, and their historical contexts. Special focus is on particular psychology paradigm characteristics of certain periods in history. Additional emphasis is placed on the research methodologies that accompany each paradigm, and on building communication skills and co-constructing understanding through class discussions, oral presentations, and analytical writing. Educational Psychology 382D (Topic 2) and 382L (Topic 17) may not both be counted. Offered on the letter-grade basis only.

**Topic 4: Psychology of Learning.** Examination of the current literature on how people learn, the factors that influence the acquisition of knowledge, and on the philosophical frameworks that have characterized views of the learning process. Educational Psychology 382D (Topic 4) and 382L (Topic 1) may not both be counted. Offered on the letter-grade basis only.

**Topic 6: Motivation and Emotion.** Overview of human motivation and emotion from a psychological perspective. Examination of classical and contemporary theories to understand the nature, predictors, functions, and consequences of motivation and emotion. Review of basic theories of motivation and emotion in application to educational issues. Educational Psychology 382D (Topic 6) and 382L (Topic 2) may not both be counted. Offered on the letter-grade basis only.

**Topic 8: Instructional Psychology.** Translating the theories and research on human learning and motivation into practice for educational psychology students through designing instruction to meet the needs of a range of audiences and instructional situations. Emphasis is placed on communicating how various learning and motivation theories get translated into design theories and instructional practice, and how a given instructional practice might be based in theory. Educational Psychology 382D (Topic 8) and 382L (Topic 3) may not both be counted. Offered on the letter-grade basis only.

**Topic 10: Complex Cognitive Processes in Education.** Higher-order thinking broadly conceptualized with attention to such processes as memory, transfer of learning, conceptual change, analogical reasoning, and inference. Offered on the letter-grade basis only.

**Topic 12: Psycholinguistics.** Examination of the intersection of language and thought from a sociolinguistic perspective. Includes readings from the latest work on models of cognition and language, first language acquisition, conversation and oral discourse use, reading comprehension, and writing processes. Educational Psychology 382D (Topic 12) and 382L (Topic 5) may not both be counted. Offered on the letter-grade basis only.

**Topic 14: Psychology of Teachers and Teaching.** Examination of research and theory pertaining to the effects of teaching on students' learning and motivation at various levels of education in order to identify key trends and findings and use those ideas in supporting instructional improvement. Discussion of research and theory on what knowledge, skills, attitudes, and beliefs are characteristic of an effective teacher at various levels and how teachers develop those skills and attitudes. Attention is given to how research in this area is conducted. Educational Psychology 182 (Topic 5), 282 (Topic 5), 382



(Topic 5) and 382D (Topic 14) may not both be counted. Offered on the letter-grade basis only.

**Topic 16: Research on Discourse Practices.** Considers the current research and thinking about how individuals use language in human interaction, how writing and reading processes are multidimensional and socially situated, and how new forms of discourse arise in social interactions. Educational Psychology 382D (Topic 16) and 382L (Topic 19) may not both be counted. Offered on the letter-grade basis only.

**Topic 20: Current Issues in Motivation.** Educational Psychology 382D (Topic 20) and 382L (Topic 20: Current Topics in Motivation) may not both be counted. Offered on the letter-grade basis only.

**Topic 22: Current Issues in Learning.** Offered on the letter-grade basis only.

### EDP 382E. Biological Basis of Behavior and Learning.

An investigation of how the biological processes influence behavior, as well as how biological, social, and psychological factors influence health, illness, and learning. Three lecture hours a week for one semester. Educational Psychology 382E and 383 may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing; twelve semester hours of upper-division coursework in educational psychology and/or psychology; and consent of the adviser in the student's area of specialization.

**Topic 2: Biological Basis of Behavior.** Only one of the following may be counted: Educational Psychology 382E (Topic 2), 382L (Topic 9), 383 (Topic 1). Offered on the letter-grade basis only.

**Topic 4: Biological Basis of Personality.** Offered on the letter-grade basis only.

**Topic 6: Educational Neuroscience.** Explores the interactions between neurobiological processes and learning, examining how cognitive neuroscience can inform and guide educational practice, as well as how the impact of the educational experience on brain development and functioning can increase our understanding of functional neural systems. Educational Psychology 182 (Topic 13), 282 (Topic 13), 382 (Topic 13) and 382E (Topic 6) may not both be counted. Offered on the letter-grade basis only.

**Topic 8: Introduction to Biomedical Issues in Autism.** Only one of the following may be counted: Educational Psychology 383 (Topic 2), 382E (Topic 8), 385 (Topic 11). Offered on the letter-grade basis only.

**Topic 10: Child and Adolescent Psychopharmacology, Health, and Learning.** Educational Psychology 382E (Topic 10) and 382L (Topic 18) may not both be counted. Offered on the letter-grade basis only.

**Topic 12: Pediatric Psychology.** Educational Psychology 382E (Topic 12) and 397 (Topic 6: Practicum in Pediatric Psychology) may not both be counted. Offered on the letter-grade basis only.

**Topic 14: Health Psychology.** Offered on the letter-grade basis only.

### EDP 382F. Human Development.

Theories of development and the educative process. Three lecture hours a week for one semester. Educational Psychology 382F and 385 may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing; twelve semester hours of upper-division coursework in education, psychology, or other behavioral sciences or consent of instructor, and consent of the adviser in the student's area of specialization.

**Topic 2: The Individual through the Life Cycle.** Explores issues such as personal identity, academic achievement, social and emotional development, and the role of social statuses in relation to gender, social class, race/ethnicity, and sexual orientation in school settings through readings, reflections, discussion, and class activities. Examines and applies theories of psychology and identity development to adolescent populations from diverse groups. Through integration of

all of these areas, students focus on developing an understanding of their experiences as an adolescent, as well as those of the youth they may encounter as they assist them in coping more effectively with life's challenges. Inquiry extends beyond the individual and asks students to think critically about social, cultural, and historical contexts and group identities. Educational Psychology 382F (Topic 2) and 385 (Topic 1) may not both be counted. Offered on the letter-grade basis only.

**Topic 4: Child and Adolescent Social, Emotional, and Cognitive Development.** Overview of the current state of empirical knowledge in the field of child development. Introduction to key topics relating to each of the major periods of human growth beginning with infancy. Focus is on the main theoretical frameworks and controversies within which knowledge is constructed in this field. Additional emphasis is on what these diverse approaches propose, and on critical evaluation of child development theory and research. Builds skills in communicating and co-constructing understanding through class discussions, oral presentations, and analytical writing. Educational Psychology 382F (Topic 4) and 385 (Topic 2) may not both be counted. Offered on the letter-grade basis only.

**Topic 6: Culture, Child Development, and Education.** Advanced graduate seminar that examines current theory and research from the psychology, anthropology, and sociology fields on the roles of culture, ethnicity, and race in the development and education of children around the world. In-depth discussion subjects include parenting and socialization; cognitive, social, and emotional development; the effects of socioeconomic status; culture change and acculturation; and racism and critical race theory. Educational Psychology 382F (Topic 6) and 391 (Topic 1), 691 (Topic 1) may not both be counted. Offered on the letter-grade basis only.

**Topic 8: Adolescent Psychosocial Development.** Examination and application of psychological research and theoretical frameworks that inform adolescent (ages twelve to nineteen) psychological, social, and identity development. Explores the social, cultural, and historical contexts that promote or impair resiliency in adolescents. Educational Psychology 382F (Topic 8) and 385 (Topic 12) may not both be counted. Offered on the letter-grade basis only.

**Topic 10: Mindfulness, Compassion, and the Self.** Research and theory related to the concept of the "self" from both Eastern and Western philosophical perspectives, and on the evidence for mental and physical health benefits of mindfulness, compassion for others, and self-compassion. Educational Psychology 382F (Topic 10) and 386N (Topic 13) may not both be counted. Offered on the letter-grade basis only.

### EDP 382G. Cultural Diversity and Individual Differences.

Theory and research on cultural diversity and individual differences as factors in psychology and education. Three lecture hours a week for one semester. Educational Psychology 381, 481 and 382G may not both be counted unless the topics vary. Educational Psychology 382G and 189H, 289H, 389H, 489H may not both be counted unless the topics vary. Educational Psychology 382G and 385 may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Offered on the letter-grade basis only.

**Topic 2: Latino/a Psychology.** United States Latino/a experiences, issues, and behavior in the context of psychological theory and research; including, but not limited to, Mexican Americans, Puerto Ricans, Dominicans, Cubans, Central, and South Americans. Integrates sub-disciplines of psychology and explores a variety of subjects relevant to the psychology of Latinos/as, including: race; ethnicity; culture; immigration; acculturation; identity; language; sexuality and sexual orientation; racial and gender socialization; racism, colonization, and colorism; oppression; and health disparities. Educational Psychology 381 (Topic 38), 481 (Topic 38) and 382G

(Topic 2) may not both be counted. Offered on the letter-grade basis only.

**Topic 4: Psychology of Women and Gender.** Study of women's experiences, issues, and behavior in the context of psychological theory and research. Integrates many sub-disciplines of psychology and explores a variety of subjects relevant to the psychology of women, including sexuality, gender socialization, sex differences, victimization, oppression, and motherhood. Educational Psychology 381 (Topic 12), 481 (Topic 12) and 382G (Topic 4) may not both be counted. Offered on the letter-grade basis only.

**Topic 6: African American Psychology.** Educational Psychology 382G (Topic 6) and 385 (Topic 13) may not both be counted. Offered on the letter-grade basis only.

**Topic 8: Educational Disabilities in Schools.** Educational Psychology 382G (Topic 8) and 189H (Topic 20), 289H (Topic 20), 389H (Topic 20), 489H (Topic 20) may not both be counted. Offered on the letter-grade basis only.

### **EDP 382Q. Research Practicum in Human Development, Culture, and Learning Sciences.**

Conference course. May be repeated for credit. Offered on the credit/no credit basis only.

### **EDP 383C. Assessment and Diagnosis.**

Advanced study of theory, issues, and application of methods of measurement and diagnostic systems. Topics include techniques to estimate individual and group differences as these inform learning and behavior in educational and community settings. Three lecture hours per weeks with additional hours to be arranged. Educational Psychology 180P, 280P, 380P, 480P and 383C may not both be counted unless the topics vary. Educational Psychology 381, 481 and 383C may not both be counted unless the topics vary. Educational Psychology 383C and 189H, 289H, 389H, 489H may not both be counted unless the topics vary. Educational Psychology 383C and 397 may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

**Topic 2: Overview of Psychoeducational Assessment.** Offered on the letter-grade basis only.

**Topic 4: Individual Testing.** Three lecture hours a week for one semester, with additional hours to be arranged. Educational Psychology 180P (Topic 3), 280P (Topic 3), 380P (Topic 3), 480P (Topic 3) and 383C (Topic 4) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 380D (Topic 2) (or 180P (Topic 1: Measurement and Evaluation), 280P (Topic 1: Measurement and Evaluation), 380P (Topic 1: Measurement and Evaluation), 480P (Topic 1: Measurement and Evaluation)) or consent of instructor.

**Topic 6: Academic Assessment and Intervention.** Educational Psychology 383C (Topic 6) and 189H (Topic 2), 289H (Topic 2), 389H (Topic 2), 489H (Topic 2) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 385C (Topic 8) (or Educational Psychology 189H (Topic 1: Law, Ethics, and History of School Psychology), 289H (Topic 1: Law, Ethics, and History of School Psychology), 389H (Topic 1: Law, Ethics, and History of School Psychology), 489H (Topic 1: Law, Ethics, and History of School Psychology)); students in areas other than school psychology must also have consent of instructor.

**Topic 8: Social and Emotional Assessment with Children and Adolescents.** Educational Psychology 383C (Topic 8) and 189H (Topic 21), 289H (Topic 21), 389H (Topic 21), 489H (Topic 21) may not both be counted Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 383C (Topic 28) (or 397 (Topic 2: Child Psychopathology)) or the equivalent; students in areas other than school psychology must also have consent of instructor.

**Topic 10: Bilingual Assessment.** Educational Psychology 383C (Topic 10) and 189H (Topic 19: Cognitive-Behavioral Assessment and Intervention), 289H (Topic 19: Cognitive-Behavioral Assessment and Intervention), 389H (Topic 19: Cognitive-Behavioral Assessment and Intervention), 489H (Topic 19: Cognitive-Behavioral Assessment and Intervention) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: For non-school psychology students, consent of instructor.

**Topic 12: Assessment in Counseling.** Introduction to the fundamentals of objective assessment, with emphasis on cultural and ethical considerations. Review of assessment techniques includes diagnostic interviewing, intelligence testing, achievement testing, objective personality testing, interpretation of assessment data, writing integrated reports, providing feedback, and making appropriate referrals. First course of a two-part sequence in psychological assessment; the second course in the sequence is Educational Psychology 383C (Topic 14). Educational Psychology 381 (Topic 6), 481 (Topic 6) and 383C (Topic 12) may not both be counted. Offered on the letter-grade basis only.

### **Topic 14: Rorschach and Thematic Apperception Test**

**Interpretation.** Second part of a two-course sequence in psychological assessment; continuation of Educational Psychology 383C (Topic 12). Educational Psychology 381 (Topic 10), 481 (Topic 10) and 383C (Topic 14) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 383C (Topic 12) (or 381 (Topic 6), 481 (Topic 6)); for students outside of counseling psychology, Educational Psychology 383C (Topic 12) (or 381 (Topic 6), 481 (Topic 6)) and consent of instructor.

**Topic 16: Introduction to Neuropsychological Assessment.** Three lecture hours a week for one semester, with additional hours to be arranged. Educational Psychology 383C (Topic 16) and 189H (Topic 7: Neuropsychological Assessment), 289H (Topic 7: Neuropsychological Assessment), 389H (Topic 7: Neuropsychological Assessment), 489H (Topic 7: Neuropsychological Assessment) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 383C (Topic 4) (or 180P (Topic 3), 280P (Topic 3), 380P (Topic 3), 480P (Topic 3)) or consent of instructor.

**Topic 18: Advanced Neuropsychological Assessment.** Educational Psychology 383C (Topic 18) and 189H (Topic 8), 289H (Topic 8), 389H (Topic 8), 489H (Topic 8) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Educational Psychology 383C (Topic 16) (or 189H (Topic 3: Neuropsychological Assessment), 289H (Topic 3: Neuropsychological Assessment), 389H (Topic 3: Neuropsychological Assessment), 489H (Topic 3: Neuropsychological Assessment)).

**Topic 26: Psychopathology.** Emphasis is placed on developing a critical understanding of, such as how to take sufficient account of abusive and stressful environments; difficulties in applying a diagnostic system reliably with incomplete understandings; normal biases and information-processing distortions to which diagnosticians are subject; sensitization to the potential for dehumanization and other harms that psychopathologists and diagnostic studies may perpetuate; and using the DSM-5 to make diagnoses. Emphasis on adolescents and adults. Three lecture hours a week for one semester, with additional hours to be arranged. Educational Psychology 383C (Topic 26) and 397 (Topic 1) may not both be counted. Offered on the letter-grade basis only.

**Topic 28: Child Psychopathology.** Emphasis is placed on developing a critical understanding of issues involved in design and implementation of diagnostic systems, such as how to take sufficient account of abusive and stressful environments; difficulties in applying a diagnostic system reliably with incomplete understandings; normal biases and information-processing distortions to which diagnosticians are subject; sensitization to the potential for dehumanization and other harms that psychopathologists and diagnostic studies may perpetuate; and using the DSM-5 to make diagnoses. Educational Psychology

383C (Topic 28) and 397 (Topic 2) may not both be counted. Offered on the letter-grade basis only.

**Topic 32: Forensic Psychology: Psychological Issues in Legal Contexts.** Designed to familiarize students with various psychological roles and influences in the courtroom, case law as related to expert testimony, ethical practice in forensic psychology, and with psychological testing and assessment procedures used and considered best practice in various forensic contexts. Educational Psychology 381 (Topic 30), 481 (Topic 30) and 383C (Topic 32) may not both be counted. Offered on the letter-grade basis only.

#### **EDP 383D. Practicum: Level One.**

The equivalent of three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### **EDP 383E. Practicum: Level Two.**

The equivalent of three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### **EDP 383F. Practicum: Level Three.**

The equivalent of three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### **EDP 384C. Prevention and Intervention.**

Advanced study of theories, processes, and techniques of evidence-based prevention and intervention to enhance learning and behavior in educational and community settings. Three lecture hours per weeks with additional hours to be arranged. Educational Psychology 381, 481, and 384C may not both be counted unless the topics vary. Educational Psychology 383 and 384C may not both be counted unless the topics vary. Educational Psychology 384C and 189H, 289H, 389H, 489H may not both be counted unless the topics vary. Educational Psychology 384C and 397 may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 2: Theories in Counseling.** Theories and research for developing counseling interventions in a pluralistic world. Educational Psychology 381 (Topic 1), 481 (Topic 1), and 384C (Topic 2) may not both be counted. Offered on the letter-grade basis only.

**Topic 4: School Counseling.** Covers subjects related to the design, implementation, and evaluation of socio-emotional interventions in educational settings. Included is a review of American School Counseling Association Standards, standards of the Texas Education Agency for school counselors, and legislative rules related to school counseling. Educational Psychology 381 (Topic 3), 481 (Topic 3) and 384C (Topic 4) may not both be counted. Offered on the letter-grade basis only. Additional prerequisite: Consent of instructor.

**Topic 6: Career Development.** Introduction to the basic principles, models, and methods of career development used in educational settings. Educational Psychology 381 (Topic 4), 481 (Topic 4) and 384C (Topic 6) may not both be counted. Offered on the letter-grade basis only.

**Topic 8: Helping and Counseling Skills.** Designed to provide a foundation for the professional practice of counseling and the skills necessary for professional training in counseling and related fields. Studies basic interpersonal helping skills, clinical interviewing, and intervention strategies. Educational Psychology 381 (Topic 8), 481 (Topic 8) and 384C (Topic 8) may not both be counted. Offered on the letter-grade basis only.

#### **Topic 10: Family Systems Interventions with Adults and Couples.**

Review of major family systems theories and practices for promoting functioning in school, work, and social relationships. Educational Psychology 381 (Topic 9: Family Systems Therapy), 481 (Topic 9: Family Systems Therapy) and 384C (Topic 10) may not both be counted. Offered on the letter-grade basis only.

**Topic 12: Family Systems Interventions with Children and Adolescents.** Review of major family systems theories and practices for promoting learning and behavior of children and adolescents. Educational Psychology 381 (Topic 9: Family Systems Therapy), 481 (Topic 9: Family Systems Therapy), and 384C (Topic 12) may not both be counted. Offered on the letter-grade basis only.

**Topic 14: Addiction Counseling.** Studies biological mechanisms of categories of commonly abused substances and treatment approaches to addiction. Includes discussion of other forms of addiction, including food, sex, and internet, and addiction in diverse populations. Educational Psychology 381 (Topic 24), 481 (Topic 24), and 384C (Topic 14) may not both be counted. Offered on the letter-grade basis only.

**Topic 18: Multicultural Counseling.** Introduction to cultural diversity and multiculturalism in counseling. Designed to help students understand important cultural issues and various cultural groups. Educational Psychology 381 (Topic 26), 481 (Topic 26), and 384C (Topic 18) may not both be counted. Offered on the letter-grade basis only.

**Topic 20: Child and Adolescent Counseling Skills and Interventions.** Designed to develop theoretical understanding and counseling skills in working with children and systems to promote development, growth, and achievement. Covers theory, research, and skills useful for conducting counseling, behavioral management, and interventions with children and adolescents. Educational Psychology 381 (Topic 36), 481 (Topic 36), and 384C (Topic 20) may not both be counted. Offered on the letter-grade basis only.

**Topic 22: Cognitive-Behavioral Therapy with Children and Adolescents.** Educational Psychology 384C (Topic 22) and 189H (Topic 9: Cognitive-Behavioral Assessment and Intervention), 289H (Topic 9: Cognitive-Behavioral Assessment and Intervention), 389H (Topic 9: Cognitive-Behavioral Assessment and Intervention), 489H (Topic 9: Cognitive-Behavioral Assessment and Intervention) may not both be counted. Offered on the letter-grade basis only.

**Topic 24: Cognitive-Behavioral Therapy with Adults.** Educational Psychology 384C (Topic 24) and 189H (Topic 9: Cognitive-Behavioral Assessment and Intervention), 289H (Topic 9: Cognitive-Behavioral Assessment and Intervention), 389H (Topic 9: Cognitive-Behavioral Assessment and Intervention), 489H (Topic 9: Cognitive-Behavioral Assessment and Intervention) may not both be counted. Offered on the letter-grade basis only.

**Topic 26: Interpersonal Intervention with Children and Adolescents.** Educational Psychology 384C (Topic 26) and 189H (Topic 3), 289H (Topic 3), 389H (Topic 3), 489H (Topic 3) may not both be counted. Offered on the letter-grade basis only.

**Topic 28: Crisis Intervention in Schools.** Educational Psychology 384C (Topic 28) and 397 (Topic 5) may not both be counted. Offered on the letter-grade basis only.

**Topic 30: Psychodynamic Psychotherapy.** Educational Psychology 381 (Topic 28), 481 (Topic 28) and 384C (Topic 30) may not both be counted. Offered on the letter-grade basis only.

**Topic 32: Integrated Behavioral Health.** Focus on integrated behavioral health care for underserved children and their families; develops knowledge and skills in integrated health care service delivery, cultural competence in health services, and family-centered health services. Educational Psychology 383 (Topic 3) and 384C (Topic 32) may not both be counted. Offered on the letter-grade basis only.

**Topic 34: Prevention Science.** Examines risk and protective influences on development and evidence based interventions that promote well-being across academic, social-emotional, and health domains. Offered on the letter-grade basis only.

#### **EDP 384D. Group Counseling and Interventions.**

Theory and research in group practice; group functioning and membership; principles of group planning; and development of leadership skills through structured in-class role-playing. Three lecture hours a week for one semester. Educational Psychology 381 (Topic 7), 481 (Topic 7) and 384D may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### **EDP 384N. Practicum in Counselor Education.**

Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### **EDP 384Q. Practicum in Counseling.**

Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### **EDP 384S. Practicum in Spanish for the Helping Professions.**

Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### **EDP 384V. Advanced Practicum.**

Advanced study and practice of theories, processes, and techniques of evidence based prevention and intervention to enhance learning and behavior in educational and community settings. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### **EDP 385C. Professional Issues, Leadership, and Development.**

Three lecture hours a week for one semester; some topics may require additional hours. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

**Topic 2: Consultation, Collaboration, and Supervision.** Educational Psychology 182 (Topic 1: Consultation Theory and Procedure), 282 (Topic 1: Consultation Theory and Procedure), 382 (Topic 1: Consultation Theory and Procedure) and 385C (Topic 2) may not both be counted. Offered on the letter-grade basis only.

**Topic 4: Ethics in Counseling.** Designed to introduce students to the ethical codes of the American Psychological Association and the American Counseling Association, as well as the Texas Administrative Codes for licensed psychologists and licensed professional counselors. Also includes a review of ethical codes and issues in school counseling. Educational Psychology 381 (Topic 19), 481 (Topic 19) and 385C (Topic 4) may not both be counted. Offered on the letter-grade basis only.

**Topic 6: Advanced Ethics and Professional Issues in Counseling.** Examines the professional roles and practices for counselors, including records management, an overview of business/family law and professional practice, and the study of current board rules. Educational Psychology 381 (Topic 22: Professional Issues in Counseling), 481 (Topic 22: Professional Issues in Counseling) and 385C (Topic 16) may not both be counted. Offered on the letter-grade basis only.

**Topic 8: Law, Ethics, and History of School Psychology.** Educational Psychology 385C (Topic 8) and 189H (Topic 1), 289H (Topic 1), 389H (Topic 1), 489H (Topic 1) may not both be counted. Offered on the letter-grade basis only.

#### **Topic 10: Professional Issues in Counseling Psychology.**

Designed to familiarize students with the primary tenets of counseling psychology including the history of counseling, vocational issues; supervision, mentorship, and consultation; cultural diversity in counseling psychology are also emphasized. Educational Psychology 381 (Topic 31), 481 (Topic 31) and 385C (Topic 10) may not both be counted. Offered on the letter-grade basis only.

**Topic 12: Seminar in Academic and Student Affairs in Higher Education.** Designed to cover subjects related to the organization and structure of settings of higher education and strategies for promoting the development of post-secondary students. Educational Psychology 381 (Topic 34), 481 (Topic 34) and 385C (Topic 12) may not both be counted. Offered on the letter-grade basis only.

#### **EDP 391N. Research Internship.**

The equivalent of three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### **EDP 392N. Internship in Human Development, Culture, and Learning Sciences.**

The equivalent of three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only.

#### **EDP 393E. School Psychology Specialist Internship.**

The equivalent of three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### **EDP 393N. Internship in School Psychology.**

The equivalent of three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only.

#### **EDP 194. Colloquium in Educational Psychology.**

Presentation and discussion of issues related to graduate study in educational psychology, including research proposals and developments in the field, by advanced graduate students, members of the faculty, and visiting lecturers. One lecture hour a week for one semester. Educational Psychology 194 and 196 may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the adviser in the student's area of specialization.

**Topic 2: Departmental Colloquium.** Required of all doctoral students in educational psychology. Educational Psychology 194 (Topic 2) and 196 (Topic 1) may not both be counted. Offered on the credit/no credit basis only.

**Topic 4: Doctoral Research Colloquium.** Required of all doctoral students in educational psychology. Educational Psychology 194 (Topic 4) and 196 (Topic 2) may not both be counted. Offered on the credit/no credit basis only.

**Topic 6: School Psychology Colloquium.** Registration for at least three semesters required of all doctoral students in school psychology. One semester required of students specializing in school psychology; two semesters required of doctoral students specializing in school psychology. Offered on the credit/no credit basis only.

**Topic 8: Human Development, Culture, and Learning Sciences Colloquium.** Required of doctoral students specializing in human development, culture, and learning sciences. Educational Psychology 194 (Topic 8) and 196 (Topic 5) may not both be counted. Offered on the credit/no credit basis only.

**Topic 10: Quantitative Methods Colloquium.** Presentation and discussion of issues related to graduate study in quantitative methods, including research proposals and developments in the field by advanced graduate students, members of the faculty, and visiting

lecturers. Required of all doctoral students specializing in quantitative methods. Educational Psychology 194 (Topic 10) and 196 (Topic 6) may not both be counted. Offered on the credit/no credit basis only.

**Topic 12: Counseling Psychology Colloquium.** Required of doctoral students specializing in counseling psychology. Educational Psychology 194 (Topic 12) and 196 (Topic 3) may not both be counted. Offered on the credit/no credit basis only.

**Topic 14: Selected Subjects Colloquium.** Educational Psychology 194 (Topic 14) and 196 (Topic 8) may not both be counted. Offered on the credit/no credit basis only.

### **EDP 394N. Internship in Counseling Psychology.**

The equivalent of three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only.

### **EDP 194R, 294R, 394R. Research.**

Individual research planned, carried out, and reported under the supervision of a Graduate Studies Committee member. For each semester hour of credit earned, one lecture hour a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing; admission to an approved program of graduate study; consent of instructor; and consent of the adviser in the student's area of specialization.

### **EDP 395R. Qualifying Process Research.**

Investigation of assigned problems under the direction of a Graduate Studies Committee member; development and demonstration of competence in research design and execution; and production of an acceptably written research report. Required of doctoral students with a major in educational psychology. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, consent of instructor, and consent of the adviser in the student's area of specialization.

### **EDP 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in educational psychology and consent of the adviser in the student's area of specialization; for 698B, Educational Psychology 698A.

### **EDP 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in educational psychology and consent of the adviser in the student's area of specialization.

### **EDP 398T. College Teaching Methodology.**

Supervised college teaching experience. Three lecture hours a week for one semester. With consent of the adviser in the student's area of specialization, may be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the adviser in the student's area of specialization.

### **EDP 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and consent of the adviser in the student's area of specialization.

### **EDP 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Educational Psychology 399R, 699R, or 999R; and consent of the adviser in the student's area of specialization.

## Foreign Language Education

*Master of Arts*

### For More Information

**Campus address:** George I. Sánchez Building (SZB) 528, phone (512) 232-4080; campus mail code: D6500

**Mailing address:** The University of Texas at Austin, Graduate Program in Foreign Language Education, 1912 Speedway Stop D6500, Austin TX 78712

**URL:** <http://www.edb.utexas.edu/education/departments/ci/programs/fle/>

### Facilities for Graduate Work

Students in foreign language education have access to research facilities in a large number of academic departments in the colleges of communication, education, and liberal arts.

Students have access to extensive print and online resources in the Perry-Castañeda Library and in specialized libraries. In addition to textbooks and pedagogical material, the collections include titles in most classical and modern languages, translations of many important works, and secondary literature on the works and their social and literary contexts.

Other research sites include the Texas Language Center, ESL Services, the Center for Open Educational Resources and Language Learning, and the Learning Technology Center.

### Areas of Study

The foreign language education program offers specializations leading to the Master of Arts degree in teaching English as a foreign or a second language, and the teaching of world languages, including Asian and Middle Eastern languages. Each student's degree program includes courses from relevant disciplines such as communication studies, curriculum and instruction, educational psychology, and linguistics, as well as in the language of specialization. It may be concerned with language teacher training, research in language teaching and second language acquisition, second language assessment and program evaluation, technology in language teaching, and theory and techniques of language materials production. Individual courses of study are arranged within these areas in accordance with the student's abilities, interests, and career goals.

### Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Carl S Blyth  
Hans C Boas  
Rebecca M Callahan  
Corinne Petra Crane  
Thomas J Garza  
Mohammad Ghanoonparvar  
Ian F Hancock  
Jacqueline M Henkel  
Frederick G Hensey  
Michael C Hillmann  
Elaine K Horwitz  
Orlando R Kelm  
Sara E Kimball  
Dale A Koike  
Min Liu

Carol H MacKay  
Anna E Maloch  
Richard P Meier  
Mohammad A Mohammad  
Deborah K Palmer  
Diana Christine Pulido  
Paul E Resta  
Cinzia Russi  
Diane L Schallert  
Jurgen K Streeck  
Per K Urlaub  
Luis Urrieta  
Anita L Vangelisti  
Helena Woodard  
Mary J Worthy

semester hours of coursework to be counted toward the degree, and admission to a field of specialization.

#### **FLE 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

#### **FLE 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Foreign Language Education 399R, 699R, or 999R.

## **Kinesiology and Health Behavior and Health Education**

*Master of Education*

*Master of Science in Health Behavior and Health Education*

*Master of Science in Kinesiology*

*Doctor of Philosophy*

## **Degree Requirements**

### **Master of Arts**

The program leading to the Master of Arts degree may consist of either thirty semester hours of coursework, including a six-hour thesis course, or thirty-three semester hours of coursework, including a three-hour course in which the student must produce a substantial report. Theses and reports are written under the guidance of a supervising professor and a reader. Further information is available from the graduate adviser.

## **Graduate Courses**

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### **Foreign Language Education: FLE**

#### **FLE 196V, 296V, 396V. Conference Course.**

Individual instruction. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in foreign language education and consent of the graduate adviser.

#### **FLE 397P. Internship.**

Internship in teaching English as a second or foreign language. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in foreign language education and consent of the graduate adviser.

#### **FLE 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in foreign language education, admission to a field of specialization, completion of nine semester hours of coursework toward the degree, and consent of the graduate adviser; for 698B, Foreign Language Education 698A.

#### **FLE 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in foreign language education, completion of nine

### **For More Information**

**Campus address:** L. Theo Bellmont Hall (BEL) 222, phone (512) 471-1273, fax (512) 471-8914; campus mail code: D3700

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Kinesiology and Health Education, 2109 San Jacinto Boulevard Stop D3700, Austin TX 78712

**E-mail:** [khegradinfo@austin.utexas.edu](mailto:khegradinfo@austin.utexas.edu)

**URL:** <http://www.edb.utexas.edu/education/departments/khe/>

### **Facilities for Graduate Work**

Excellent teaching and research laboratories are available to graduate students in kinesiology and health education. Special classrooms and computer facilities are available, as well as teaching laboratories for human anatomy, biomechanics, exercise physiology, exercise and sport psychology, motor control and learning, physical development and aging, children's movement, and athletic training. Research laboratories are available for both basic and applied research with whole-body and subcellular investigations. Also available for field research are various schools, institutions, and agencies in Austin and surrounding communities.

### **Areas of Study**

Most students major in either health behavior and health education or kinesiology. Students may also pursue a general program, leading to the Master of Education, that allows for specialization in either health behavior and health education or kinesiology but includes coursework in both areas.

### **Health Behavior and Health Education**

The programs leading to the Master of Science in Health Behavior and Health Education or the Doctor of Philosophy with a major in health behavior and health education emphasize a developmental and research-based approach to health promotion across the life span. Students in the Master of Education with a major in health behavior and health education program specialize in either physical activity and health promotion or lifespan health promotion.

All the health behavior and health education degree programs provide students with a solid background in the social and behavioral foundations of health. Students have the opportunity to design a course of study suited to their interests and the research interests of the faculty. The

program prepares students for academic, research, and applied careers in health promotion.

## Kinesiology

Students pursuing the Master of Science in Kinesiology specialize in exercise science or sport management; doctoral students may also specialize in physical culture and sports studies. Within exercise physiology, master's degree students follow a general course of study or focus their work on clinical exercise physiology, sport sciences and nutrition, or exercise and sport psychology; doctoral students focus on human performance or exercise biochemistry. Students in movement science focus their work on biomechanics, motor control and learning, clinical movement science, sport movement science, or developmental science: pediatrics and aging.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Lawrence D Abraham	Carole K Holahan
John Bartholomew	Thomas M Hunt
Robert Matthew Brothers	Jody Jensen
Sharon A Brown	Esabelle M Jowers
Jessica Duncan Cance	Harold Willis Kohl III
Ben Carrington	Alexandra Loukas
Darla M Castelli	Julie Maslowsky
Edward F Coyle	Keryn Elizabeth Pasch
Jonathan B Dingwell	Fred L Peterson Jr
Marlene A Dixon	Mary A Steinhardt
Roger P Farrar	Hirofumi Tanaka
Lisa Griffin	Janice S Todd
John M Hoberman	

## Admission Requirements

A student who lacks the prerequisite coursework described below may be admitted to the Graduate School, but he or she must then complete coursework in the appropriate areas in addition to degree requirements.

## Health Behavior and Health Education

To be admitted to the general Master of Education program, the applicant must have completed an undergraduate major or at least twelve semester hours of upper-division coursework in physical education, kinesiology, and/or health education.

An applicant to the Master of Science in Health Behavior and Health Education or Master of Education with a major in health behavior and health education degree program with specialization in physical activity and health promotion or lifespan health promotion must have completed an undergraduate major in health education or a related discipline. The applicant must have completed at least three semester hours of coursework in each of the following areas: theory and methods of health education and/or health promotion, behavioral sciences, and statistics.

**Doctoral degree programs.** An undergraduate major in health education or a related discipline is required; the student must have completed at least three semester hours of coursework in each of the following areas: behavioral sciences, theory and methods of health education and/or health promotion, and statistics. The applicant must also be sponsored by a member of the Graduate Studies Committee. Applicants to the PhD program must demonstrate the ability to conduct independent research.

## Kinesiology

1. **Kinesiology.** To be admitted to the general Master of Education program, the applicant must have completed an undergraduate major or at least twelve semester hours of upper-division coursework in physical education, kinesiology, and/or health education.
2. **Exercise Science.**

**Exercise physiology.** An applicant to the master's or doctoral degree program with specialization in exercise physiology must have an undergraduate major in kinesiology or a related discipline and must have completed coursework in human anatomy, exercise physiology, and biomechanics. Applicants who plan to focus on exercise and sport psychology must also have completed coursework in sport psychology; all other applicants to the exercise physiology specialization must have completed coursework in vertebrate physiology. Doctoral applicants must also be sponsored by a member of the Graduate Studies Committee and must demonstrate the ability to conduct independent research.

**Movement science.** An applicant to the master's or doctoral degree program with specialization in movement science must have an undergraduate major in kinesiology or a related discipline, and must have completed coursework in human anatomy, exercise physiology, biomechanics, and motor control and learning. Doctoral applicants must also be sponsored by a member of the Graduate Studies Committee and must demonstrate the ability to conduct independent research.

3. **Sport management.** For admission to the master's or doctoral degree program with specialization in sport management, an undergraduate major in kinesiology or a related discipline is recommended; the student must demonstrate competency in management and marketing and in two of the following areas: sport ethics/philosophy, sport history, sport law, sport sociology, social psychology of sport, and sport economics. These competencies can be further developed in the first year of the program. Doctoral applicants must also be sponsored by a member of the Graduate Studies Committee and must demonstrate the ability to conduct independent research.

## Degree Requirements

### Master of Science

**Master of Science in Health Behavior and Health Education with thesis.** The Master of Science in Health Behavior and Health Education (MSHBHE) consists of at least thirty-six semester hours of graduate study. All students seeking the MSHBHE concentrate coursework and research in an area of departmental specialization. Of the nine semester hours of upper-division coursework allowed in the program, no more than six hours may be included in either the major or the minor. The minor field consists of six semester hours taken outside the department. A statistics course, a course in research methods, and the thesis course are required.

**Master of Science in Kinesiology with thesis.** The specializations in exercise physiology and movement science consist of at least thirty semester hours of graduate study; the sport management specialization consists of at least thirty-six hours. All students seeking the Master of Science in Kinesiology concentrate coursework and research in an area of departmental specialization. Of the nine semester hours of upper-division coursework allowed in the program, no more than six hours may be included in either the major or the minor. The minor field consists of six semester hours taken outside the department. A statistics course, a course in research methods, and the thesis course are required.

**Master of Science in Kinesiology with report.** The specializations in exercise physiology and movement science consist of at least thirty-three semester hours of graduate study; the sport management specialization consists of at least thirty-six hours. Students concentrate coursework and research in an area of departmental specialization. Of the nine semester hours of upper-division coursework allowed in the program, no more than six hours may be included in either the major or the minor. The minor field consists of six semester hours taken outside the department. A statistics course, a course in research methods, and the report course are required.

## Master of Education

This degree program consists of at least thirty-six semester hours of graduate study. Students concentrate coursework in an area of departmental specialization or pursue a general program in either kinesiology or health behavior and health education. Of the nine semester hours of upper-division coursework allowed in the program, no more than six hours may be included in either the major or the minor. All specializations require at least twenty-one semester hours of approved coursework within the department and six hours outside the department. To complete any of the specializations, satisfactory performance in an approved culminating experience is required.

## Doctor of Philosophy

The Doctor of Philosophy is a research degree designed to prepare students as scholars in a designated area of specialization.

During the student's first year in the program, the student works with his or her adviser to prepare a program of study, which must be approved by the Graduate Studies Committee. Prior to admission to candidacy for the doctoral degree, the student must successfully complete the comprehensive examination covering the area of specialization. The student must present the dissertation proposal to the Graduate Studies Committee. The dissertation must represent an independent scholarly investigation of a problem pertinent to the field of kinesiology or health behavior and health education. It deals with basic questions in the area of specialization and must constitute a scholarly contribution to the body of knowledge in the profession.

The PhD programs in health behavior and health education and kinesiology are outlined below. More detailed descriptions and requirements for each of the specializations are available from the graduate adviser.

## Health Behavior and Health Education

The Doctor of Philosophy with a major in health behavior and health education is designed to allow the student to develop a Program of Work appropriate to his or her research interests. The program includes at least fifteen semester hours of core coursework in health behavior and health education, twelve hours of statistics and research methods, and six hours of supporting coursework outside the department. Students must also complete research experience that includes at least eight hours of independent study, four hours of departmental seminar, and eighteen hours in the dissertation courses.

## Kinesiology

The Doctor of Philosophy with a major in kinesiology involves specialization in exercise physiology, movement science, sport management, or physical culture and sports studies. Exercise physiology involves in-depth study in human performance or exercise biochemistry. Movement science students concentrate in biomechanics; motor control and learning; clinical movement science; sport movement science; or developmental science: pediatrics and aging. Sport management involves training students to undertake research in the management and marketing of sport organizations and enterprises. Physical culture and sports studies

involves coursework in at least one academic department on campus other than the Department of Kinesiology and Health Behavior and Health Education; the curriculum includes sport history, exercise history, sport and gender, and other sociocultural aspects of sport.

Each student completes coursework in preparation for a comprehensive examination in one of these specializations. The program also includes a departmental elective taken outside the area of specialization; six semester hours of graduate coursework in statistics, biometry, or an appropriate area of mathematics; nine hours of supporting work outside the department; research experience that includes at least six hours of independent study; and eighteen hours in the dissertation courses.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Health Education: HED

#### HED 386. Research Methodologies.

Disciplines of research methods, research design, data-producing techniques, treatment and interpretation of data, reporting on research. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Research Methods: Proposal Writing.** Additional prerequisite: Educational Psychology 371 or an equivalent introductory statistics course with a grade of at least C.

**Topic 2: Research Methods: Applied Research Techniques.**

#### HED 395. Advanced Topical Studies.

Group and individual studies of advanced topics; critique and synthesis of research findings and of literature. The equivalent of three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Foundations of Health Promotion.**

**Topic 3: Worksite Wellness & Health Promotion.** Introduction of the business model approach as an evaluation and justification of worksite wellness.

**Topic 4: Intervention Mapping: Health Promotion Program Development.**

**Topic 5: Issues in School and College Health.**

**Topic 6: Theories of Health Behavior.**

**Topic 7: Foundations of Epidemiology.**

**Topic 8: Theories of Substance Abuse.**

**Topic 11: Human Sexuality.**

**Topic 12: Child and Adolescent Health Psychology.** Introduction to the psychological, social, and physical aspects of childhood and adolescence. Issues are addressed from a developmental-contextual perspective.

**Topic 16: Organizational and Social Change for Health Promotion.**

**Topic 17: Mind/Body Health.** The scientific basis for mind/body health; overview of clinically tested mind/body interventions in each dimension of health: emotional, psychological, physical, spiritual, intellectual, and social.

**Topic 18: Adolescent Problem Behaviors: A Developmental Perspective.** In-depth theoretical and empirical analysis from a developmental perspective of adolescent problem behaviors. Individual



and contextual factors related to adolescent substance abuse, early sexual activity, pregnancy and childbearing, and emotional problems.

**Topic 19: Public Health Communication: Case Studies.** Introduction to applications of social cognitive learning theory and innovation diffusion theory in the design of campaigns to change health behaviors.

**Topic 20: Adult Development, Aging, and Health.** Overview of current research and theory in the study of adult development, aging, and health. Considers the interaction of biological, psychological, and social factors in health and well-being.

**Topic 21: Risk and Resilience in Children and Adolescents.** Introduction to the theories and methods of child and adolescent risk and resilience. Examines resilience processes in populations at elevated risk for negative outcomes and explores how empirical research contributes to the development of programs aimed at strengthening resilience in at-risk youth.

**Topic 22: Politics of Health and Long-Term Care Reform.**

**Topic 23: Health Issues in Gerontology.** An introduction to physical, psychological, and social perspectives on aging, with an emphasis on health and health care of older adults. Explores the impact of an aging society on socioeconomic, political, and health care systems.

**Topic 24: Social and Behavioral Aspects of International Health.** Behavioral science principles and methods of international cooperation in research and action, illustrated by case studies.

**Topic 25: Politics and Policies in an Aging Population.** The impact of an aging population on social institutions; the utility of different approaches to the social welfare demands of an ethnically and racially diverse population.

**Topic 26: Planning Health Promotion Programs.** Introduction to the processes of planning, implementing, and evaluating health promotion programs. Students develop a health promotion intervention and evaluation plan for a public health issue. Additional prerequisite: Health Education 370K (Topic 1: Foundations of Health Promotion I).

**Topic 27: Physical Activity and Public Health Practice.** Practice strategies for implementation of public health programming related to physical activity, approached through review of the current research literature. Topics focus on evidence-based strategies, and key approaches to program development, implementation, and evaluation.

**Topic 28: Social Determinants of Health.** Introduces the social factors/determinants that influence health, including: race, class, education, family, neighborhood, media, global influences, immigration, and gender. Theoretical and methodological approaches to the study of social determinants will be discussed from a social ecological perspective.

### **HED 196, 296, 396. Doctoral Seminar.**

Individual or shared project research with reports evaluated by seminar participants and the instructor. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and written consent form.

### **HED 296T, 396T. Directed Research in Health Education.**

Investigation of assigned problems under the direction of a Graduate Studies Committee member; development and demonstration of competence in research design and execution; production of an acceptably written research report. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and written consent form.

### **HED 197, 397. Research Problems.**

Individual or group research in a specialized area of health education. The equivalent of one or three lecture hours a week for one semester. May be

repeated for credit. Prerequisite: Graduate standing and written consent form.

### **HED 397P, 697P. Graduate Internship.**

Supervised practice in a professional organization or institution. The equivalent of nine or eighteen laboratory hours a week for one semester. May be repeated for credit by doctoral students. Prerequisite: Graduate standing and admission by internship committee.

### **HED 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in health education and written consent of the graduate adviser; for 698B, Health Education 698A and written consent of the graduate adviser.

### **HED 398T. Teaching in Higher Education.**

Provides graduate students with the knowledge and ability to teach in higher education. An overview of diverse instructional strategies, common issues in teaching and learning, short- and long-term planning, practical aspects of course design and management, as well as assessment and grading practices. Reviews historical perspectives on the research in teaching and learning. Three lecture hours a week for one semester. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **HED 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and written consent form.

### **HED 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Health Education 399R, 699R, or 999R; and written consent form.

## **Kinesiology: KIN**

### **KIN 382. Conference-Laboratory.**

Laboratory or workshop-type instruction dealing with selected problems in specialization areas of kinesiology. Conference course. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Laboratory Techniques in Exercise Physiology.** The theory and practice of modern laboratory and field techniques used to evaluate human physical performance and physiological function. Additional prerequisite: Kinesiology 325K, or consent of instructor.

**Topic 4: Biomechanics Laboratory.** Additional prerequisite: Kinesiology 395 (Topic 36: Biomechanics of Human Movement), two semesters of calculus, and one semester of college physics (mechanics); or consent of instructor.

**Topic 6: Advanced Laboratory Techniques in Exercise Physiology.** Knowledge and skills needed to assess the metabolic characteristics of the rat, to evaluate the metabolic characteristics of skeletal muscle, and to perform essential biochemical assays and procedures that are typically used in biochemical and molecular biology experiments. Additional prerequisite: Consent of instructor.

**Topic 7: Clinical Exercise Physiology: Theory and Practice.** Designed for students interested in assessing physical fitness and well-being and designing exercise programs in corporate, community, clinical, occupational, and commercial settings. Students receive practical experience assessing physical fitness. Additional prerequisite: Kinesiology 325K or the equivalent.

**Topic 9: Motor Development: Assessment.** Review of screening, diagnostic, or programmatic motor assessment instruments. Includes test psychometrics, test content, appropriate population, and comparable or competing assessments. Additional prerequisite:

Kinesiology 321M or the equivalent, Kinesiology 395 (Topic 45: Seminar in Motor Development), or consent of instructor.

**Topic 10: Pedagogical Technology.** Analysis and application of fundamental and advanced technologies in physical activity settings. Prerequisite: Graduate standing, or consent of instructor.

### **KIN 386. Research Methodologies.**

Disciplines of research methods, research design, data-producing techniques, treatment and interpretation of data, reporting on research. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Research Methods: Proposal Writing.** Required of all candidates for the master's degree in kinesiology with thesis or report. Additional prerequisite: Educational Psychology 371 or an equivalent introductory statistics course with a grade of at least C.

**Topic 2: Research Methods: Applied Research Techniques.**

**Topic 3: Qualitative Research Methods PCSS.** Introduction to the theoretical and methodological aspects of qualitative research, as well as qualitative research approaches from a variety of disciplines and philosophical traditions with an emphasis on the application of research designs, data collection, and analysis techniques for researchers of sport, physical culture, exercise, and physical activity. Recommended for students specializing in sport management or interdisciplinary sport studies. Kinesiology 386 (Topic: Qualitative Research Methods PCSS) and Kinesiology 386 (Topic 3) may not both be counted.

**Topic 4: Research Methods: Grant Writing.** Restricted to students in the Department of Kinesiology and Health Education. Disciplines of research methods, research design, data-producing techniques, treatment and interpretation of data, and reporting on research. Recommended for doctoral students interested in pursuing a post-doctoral experience. Kinesiology 386 (Topic: Research Methods: Grant Writing) and Kinesiology 386 (Topic 4) may not both be counted.

**Topic 5: Archival Research Methods in Physical Culture and Sport History.** Selected research methods and techniques used in archival research at the theoretical and pragmatic level. Familiarizes students with research methods for both paper-based and digital archives.

### **KIN 395. Advanced Topical Studies.**

Graduate seminar in topics related to specialization areas. Three lecture hours a week for one semester. Additional hours may be required for some topics. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 1: Ergogenic Aids for Exercise.** Additional prerequisite: Kinesiology 325K or consent of instructor.

**Topic 2: Cardiac Metabolism.** Additional prerequisite: Kinesiology 395 (Topic 46), and Chemistry 339 or consent of instructor.

**Topic 3: Physiology of Aging.** Additional prerequisite: Kinesiology 395 (Topic 46).

**Topic 4: Biomechanics of Sport.** Additional prerequisite: Kinesiology 324K and 326K, or consent of instructor.

**Topic 5: Exercise and Preventive Medicine.** Additional prerequisite: Kinesiology 325K.

**Topic 8: Motor Control: Neuromuscular Bases.** Additional prerequisite: Kinesiology 336 or consent of instructor.

**Topic 9: Motor Control: Performance and Learning.** Additional prerequisite: Kinesiology 315 or consent of instructor.

**Topic 10: Neural Control of Posture and Locomotion.** Additional prerequisite: Kinesiology 336 or consent of instructor.

**Topic 12: Muscle Physiology and Plasticity.** Additional prerequisite: Kinesiology 395 (Topic 46) or consent of instructor.

**Topic 13: Aging Motor Systems.**

**Topic 15: Conditioning for Competitive Athletes.** The physiological factors that govern the adaptations derived from acute and chronic

exercise training. Focus will be placed on training adaptation in competitive athletes as they represent the extreme. Additional prerequisite: Kinesiology 325K or consent of instructor.

**Topic 16: Cardiovascular Response to Exercise.** Additional prerequisite: Kinesiology 325K or consent of instructor.

**Topic 18: Fitness Testing and Evaluation.**

**Topic 21: Children's Exercise and Activity.** Physiological bases for changes in exercise and sports performance and in exercise capacity throughout childhood and adolescence. Includes aspects of cardiovascular, respiratory, and metabolic changes and issues related to thermoregulation, training, gender, and health and fitness. Additional prerequisite: Kinesiology 321M and 325K, or consent of instructor.

**Topic 23: Critical Issues and Events in American Sport.**

**Topic 25: Fat Metabolism during Exercise.** Additional prerequisite: Kinesiology 395 (Topic 46), or 325K and consent of instructor.

**Topic 26: Legal Issues in Sport.**

**Topic 27: Athletics Administration.**

**Topic 28: Physical Dimensions of Aging.**

**Topic 29: Ethics in Sport.**

**Topic 32: Sport Marketing.** Additional prerequisite: An introductory undergraduate or graduate survey course in marketing.

**Topic 33: Musculoskeletal Biomechanics.** Synthesis of properties of the musculotendon and skeletal systems to construct detailed computer models that quantify human performance and muscular coordination. Additional prerequisite for kinesiology students: Mathematics 341, Kinesiology 395 (Topic 36), and consent of instructor.

**Topic 36: Biomechanics of Human Movement.** Additional prerequisite: Kinesiology 326K, two semesters of calculus, one semester of college physics (mechanics), and consent of instructor.

**Topic 38: Muscle Metabolism during Exercise.**

**Topic 42: Facility and Event Management.** Management and operation of sport, recreation, convocation, convention, and other public assembly facilities.

**Topic 43: Psychology of Exercise.** The benefits of exercise in moderating negative psychological states such as anxiety, stress reactivity, and depression. Additional prerequisite: Kinesiology 325K.

**Topic 44: Sport Finance.** Designed to reinforce students' understanding of finance and its role in sport and health promotion programs, and to provide students with the knowledge and skills needed in the administration of sport and health promotion programs.

**Topic 45: Pediatric Motor Development.** Additional prerequisite: Kinesiology 321M, or consent of instructor.

**Topic 46: Advanced Exercise Physiology I.** Designed to provide students with the essential graduate background for the application and practice of exercise physiology. The integration of the nervous, skeletal muscle, and cardiovascular systems from the subcellular level to the whole-organism level. Additional prerequisite: Kinesiology 325K.

**Topic 47: Advanced Exercise Physiology II.** The physiological and metabolic response to exercise, with emphasis on integrating the whole-body and cellular responses. In a variety of topics, students review basic physiology, focus on responses during exercise, and apply their findings to situations in the clinical and sporting environments. Additional prerequisite: Kinesiology 395 (Topic 46).

**Topic 48: Social Psychology of Sport and Physical Activity.** The theoretical structure that underlies social psychology as it has been applied to sport. Emphasis on the psychological concerns that confront coaches in their interactions with individual athletes and teams. Additional prerequisite: Kinesiology 311K or consent of instructor.

**Topic 49: Sports Nutrition.** The nutritional needs of people whose physical activity ranges from recreational to elite competitive athletics. Development of practical dietary strategies that recognize the unique nature of sport and the role of diet in promoting optimal physiological adaptation to training. Three lecture hours and one and one-half

discussion hours a week for one semester. Additional prerequisite: Kinesiology 325K or consent of instructor.

**Topic 50: Sport Psychology.** The general field of experimental sport psychology, with emphasis on the psychological components of individual performance. Designed to prepare students to discuss the important questions, methodology, and experimental literature in selected areas of sport psychology. Additional prerequisite: Kinesiology 311K or consent of instructor.

**Topic 51: Adult Development, Aging, and Health.**

**Topic 52: Organizational Behavior in Sport.** Determinants and consequences of individual motivation and attitudes in organizations generally and in sport organizations specifically. Theory related to the individual often responsible for motivating people toward organizational goals, the leader. Additional prerequisite: For students in the College of Education, Management 320F or the equivalent; for others, Management 320F or the equivalent, and consent of instructor.

**Topic 53: Sport Public Relations and Sales.** Detailed study of the relationship between the media, corporate sponsorship, and sport. Focus on various media techniques utilized by sport managers and sport sponsorship basics. Additional prerequisite: Kinesiology 395 (Topic 32) or the equivalent or consent of instructor.

**Topic 54: The Biology of Aging.**

**Topic 55: Assessment of Physical Function in Older Adults.** Introduction to the goals, issues, and procedures that relate to the clinical assessment of physical function in the elderly (sixty-five and older).

**Topic 56: Sport and Special Event Management.** Introduction to key considerations when planning, implementing, and evaluating an event. Considers the organization of the events industry worldwide and examines how events link to other sectors of the economy. Specialized skills for the management and marketing of events. Students have the opportunity for hands-on practice in the use of the necessary tools for planning, programming, administering, and evaluating an event.

**Topic 57: Managing People and Organizations.** Graduate-level preparation in select subjects in organizational behavior and human resources management. Additional prerequisite: Previous coursework in foundations of organizational behavior and administration.

**Topic 58: Sport Consumer Behavior.** An examination of contemporary theory and research on the subject of sport consumer behavior.

**Topic 59: Biomechanics in Clinical Settings.** Designed to provide students with the basic biomechanical competence required to understand how normal human movements are generated, how movements are altered by injury or pathology, and how clinical intervention can improve performance. Additional prerequisite: Kinesiology 324K and 326K, or the equivalent.

**Topic 60: Sport Policy.** The formulation and analysis of sport policies: the uses of policy analysis in sport settings; environmental, economic, and sociopolitical impacts of sport, including policy implications.

**Topic 61: Central Questions in Biomechanics and Motor Control.** Designed to allow students to explore specific topics of current interest in biomechanics and/or motor control; to learn to evaluate the scientific literature in areas of current debate or controversy; and to develop scientifically sound, relevant, and experimentally testable research hypotheses. Additional prerequisite: Kinesiology 382 (Topic 4: Biomechanics Laboratory), and Kinesiology 395 (Topic 36) or written consent of instructor.

**Topic 62: Aging and Cardiovascular Function and Disease Risks.** Cardiovascular changes associated with aging; scientific issues and hypotheses in the area of aging and cardiovascular function and disease risks; and presenting critical analyses of these issues. Additional prerequisite: An upper-division course in human or vertebrate physiology.

**Topic 63: Introduction to Nonlinear Dynamics in Biological Systems.** Basic concepts of nonlinear mathematics and their

application to biological systems. Additional prerequisite: Two semesters of college-level calculus and consent of instructor.

**Topic 64: Neuromuscular Aspects of Fatigue and Training.**

The role of the central nervous system during muscular fatigue and exercise training. Additional prerequisite: Consent of instructor.

**Topic 65: Sport Development.**

**Topic 66: Marketing Research for Sport.**

**Topic 67: Theories and Issues in Sport Management.**

**Topic 68: Human Resource Management in Sport Organizations.**

**Topic 69: Physical Activity Assessment in Individuals and Populations.** Provides an understanding of the various methods used to measure physical activity and related constructs (such as sedentary behavior, movement, and physiological attributes), and the mechanisms by which physical activity influences health outcomes. Covers all forms of physical activity measurement, assessment of built environment, and psychosocial correlates of physical activity, as well as validity, reliability, and related statistical strategies.

**Topic 70: Human Cardiovascular and Autonomic Physiology.**

Introduction to the regulation of the cardiovascular and autonomic nervous system in health and disease.

**Topic 71: Cognition and Exercise Across the Lifespan.** Detailed study of the relationship between brain health and physical activity behaviors across the developmental life stages; focused on the effects of physical activity programming on cognitive control and performance. Kinesiology 395 (Topic: Cognition and Exercise Across the Lifespan) and 395 (Topic 71: Cognition and Exercise Across the Lifespan) may not both be counted.

**Topic 73: History of Sport and Business.** Survey of the development of modern sport industry from late nineteenth-century roots to twenty-first century global phenomenon. Examines connections between media and sport; the role of IMG and other sport agencies in event sponsorship and creation of celebrity athletes; growth of professionalism in the Olympic movement; the rise of megacorporations; and the commercialization of college and high school athletics.

**Topic 74: History of Physical Culture and Alternative Medicine.**

Examines the history of the various practices used to strengthen, enhance, and improve the health of the body through exercise, dietary manipulation, and other holistic practices. Kinesiology 395 (Topic: History of Physical Culture and Alternative Medicine) and Kinesiology 395 (Topic 74) may not both be counted.

**Topic 75: Sport and International Relations.** Examines the relationship between sport and international relations.

**Topic 76: History of Exercise Science and Sports Medicine.** Traces the evolution of exercise science and sports medicine from Classical Greece to the present.

**Topic 77: Strategic Management in Sport.** Graduate level preparation in developing and analyzing organizational strategies. Preparation for consultancy work as well as composing and analyzing business plans.

### **KIN 196, 396. Doctoral Seminar.**

Individual or shared project research with reports evaluated by seminar participants and the instructor. The equivalent of one or three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and written consent form.

### **KIN 296T, 396T. Directed Research.**

Investigation of assigned problems under direction of a Graduate Studies Committee member; development and demonstration of competence in research design and execution; production of an acceptably written research report. Conference course. May be repeated for credit. Prerequisite: Graduate standing and written consent form.

### **KIN 197, 397. Research Problems.**

Individual or group research topics in a specialization area of kinesiology. One or three conference or lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and written consent form. Some sections also require consent of instructor; these are identified in the Course Schedule.

### **KIN 197P, 397P, 697P. Graduate Internship.**

Supervised practice in a professional organization, business, or institution. The equivalent of three, nine, or eighteen laboratory hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing, a University grade point average of at least 3.00 and a grade point average in the major department of at least 3.00, and written consent form.

### **KIN 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in kinesiology and written consent of the graduate adviser; for 698B, Kinesiology 698A and written consent of the graduate adviser.

### **KIN 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in kinesiology and written consent of the graduate adviser.

### **KIN 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and written consent form.

### **KIN 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Kinesiology 399R, 699R, or 999R; and written consent form.

## **Science, Technology, Engineering, and Mathematics Education**

*Master of Arts  
Master of Education  
Doctor of Philosophy*

### **For More Information**

**Campus address:** George I. Sánchez Building (SZB) 462, phone (512) 471-7354 or 471-3747, fax (512) 471-8460; campus mail code: D5700

**Mailing address:** The University of Texas at Austin, STEM, 1912 Speedway Stop D5700, Austin TX 78712-0379

**E-mail:** sflynn@austin.utexas.edu; riegler@austin.utexas.edu; empson@austin.utexas.edu

**URL:** <http://www.edb.utexas.edu/education/departments/ci/programs/stem/>

### **Facilities for Graduate Work**

Facilities for graduate work include state-of-the-art computer, multimedia, and videoconferencing laboratories, laboratories for science, technology, engineering, and mathematics (STEM) research, field-based sites for implementation studies in local school districts, and numerous federal- and state-funded research and development projects in science, technology, engineering, and mathematics education. The University

Libraries contain more than eight million volumes and provide access to a wide variety of print-based and electronic research tools, the latter through their Web site (<http://www.lib.utexas.edu>). Library units serving science, technology, engineering, and mathematics include the Kuehne Physics Mathematics Astronomy Library, the Mallet Chemistry Library, the Walter Geology Library, and the Life Science Library.

### **Areas of Study**

Graduate study in science, technology, engineering, and mathematics (STEM) education is offered through an interdisciplinary program that combines content preparation with educational research and scholarship, in a setting that fosters and supports tight links to educational practice. The program is anchored by a set of core courses addressing learning, instruction, curriculum, technology, equity, policy, and systemic reform in STEM education, at the elementary, secondary, and postsecondary levels. Coursework is chosen from departments in the College of Education, Cockrell School of Engineering, and College of Natural Sciences, as well as other appropriate University colleges.

## **Degree Requirements**

### **Master's Degrees**

Prerequisites for admission to each master's degree program are a baccalaureate degree and prior coursework in education, science, technology, engineering, or mathematics.

**Master of Arts.** The program consists of thirty-six hours for a Master of Arts with thesis, or thirty-three hours for a Master of Arts with no thesis. The major field is composed of eighteen hours in science, technology, engineering, and mathematics (STEM) education, including twelve hours in the STEM education core course and advance topic sequence, and six hours of research methods classes in STEM education. The minor field consists of nine hours of content courses in science, technology, engineering, or mathematics. Additional hours (six hours for the no thesis option and three hours for the thesis option) may be drawn from coursework chosen by the student in conjunction with the graduate adviser. Students pursuing the thesis option take six additional hours of coursework for thesis preparation.

**Master of Education.** The program is the same as the program for the Master of Arts described above, with one exception: in addition to the requirements for a Master of Arts, students must be certified to teach at the elementary or secondary level.

**Summer option for master's degrees.** Some students may be able to pursue either master's degree by enrolling in the summer option. Under this option, the majority of the coursework is completed in three consecutive summer terms at the University of Texas at Austin, with some additional coursework completed online during the fall and spring semesters.

### **Doctor of Philosophy**

Students seeking the degree of Doctor of Philosophy must show evidence of related professional and academic experience.

### **Program Requirements**

**Core courses.** Students must complete the fifteen-semester-hour core course sequence in science, technology, engineering, and mathematics education. A description of the sequence is available from the graduate program.

**Research methodology.** Students must complete at least twelve hours of coursework in research methodology.

**Content courses.** Students must complete fifteen semester hours of coursework in science, technology, engineering, or mathematics. This requirement is waived for students who enter the program with a master's degree in mathematics, one of the sciences, or engineering.

**Related courses.** Students are expected to broaden and deepen their Program of Work by taking a variety of related courses consonant with their scholarly interests. This coursework must be chosen in consultation with the graduate adviser or faculty mentor.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Science, Technology, Engineering, and Mathematics Education: STM

#### **STM 180, 280, 380. Topics in Teaching Science, Technology, Engineering, and Mathematics.**

Classroom applications of research in science, technology, engineering, and mathematics education, and related policy issues. For each semester hour of credit earned, one lecture hour a week for one semester. Science-Mathematics Education 180, 380 and Science, Technology, Engineering, and Mathematics Education 180, 280, 380 may not both be counted. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

#### **STM 385. Knowing and Learning in STEM Education.**

Different approaches to theorizing and studying science, technology, engineering, and mathematics (STEM) learning and epistemology and synthesis of the scientific basis of learning. A major research project will focus on studying students' thinking in a particular STEM related domain. Prerequisite: Graduate standing.

#### **STM 385G. Seminar: Program Development and Research.**

Advanced investigations of selected topics and problems in curriculum theory, program design, and research design at one of the following levels: elementary school, secondary school, higher education, all-level. Three lecture hours and one laboratory hour a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### **STM 386. Curriculum History and Development in STEM Education.**

Historical development of school mathematics and science curricula in the United States in the last 150 years, and examination of current curricular trends. A summative project consisting of a research paper and a presentation will allow students to delve deeper into a topic of individual interest. Prerequisite: Graduate standing.

#### **STM 390. Critical Issues in STEM Education.**

In-depth study of issues that are central to understanding and improving STEM education at one of the following levels: elementary school, secondary school, higher education, or all-level. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Equity in STEM Education.** Study of the meaning of equity in STEM education and how interpretations align with frameworks for viewing equity. Research, practice, and strategies designed to make

STEM education equitable for students of diverse genders, ethnicities, linguistic and cultural backgrounds, socioeconomic status, and physical and learning abilities. History of multicultural education, mathematics, and science teaching for social justice.

**Topic 2: Research on Teaching and Teacher Development in STEM Education.** Scholarship related to STEM teaching and how it can be used to address problems in K-12 school instruction. Research on teaching, teacher knowledge and beliefs, and teacher education and professional development; relationships among research, theory, and practice; and consideration of a variety of critical issues, including the meaning of effective instruction and evidence-based arguments about teaching, and how research on student thinking and theories of learning inform our understanding of teaching.

**Topic 3: Systemic Reform in STEM Education.** Overview of the major efforts at systemic reform in STEM education. Development and testing of models of reform initiatives.

#### **STM 390T. Advanced Topics in STEM Education.**

Advanced investigations of selected topics and critical issues in STEM education aligned with STEM education faculty research interests. Students will typically produce a product (paper, presentation, proposal) that can be submitted to professional or funding agencies. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### **STM 196, 396. STEM Education Forum.**

Seminar highlighting current research in STEM education. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### **STM 196T, 296T, 396T. Directed Research in Science, Technology, Engineering and Mathematics Education.**

For each semester hour of credit earned, one lecture hour a week for one semester. May be repeated for credit. Prerequisite: Graduate standing.

#### **STM 196V, 396V. Independent Study.**

Involves syntheses of literature, field investigations on selected topics, or other individual research topics. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### **STM 698. Thesis.**

The equivalent of three hours a week for two semesters. Science-Mathematics Education 698 and Science, Technology, Engineering, and Mathematics Education 698 may not both be counted. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in science, technology, engineering, and mathematics education and consent of the graduate adviser; for 698B, Science, Technology, Engineering, and Mathematics Education 698A.

#### **STM 398R. Master's Report.**

Restricted to master's students in science, technology, engineering, and mathematics education. Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Science-Mathematics Education 398R and Science, Technology, Engineering, and Mathematics Education 398R may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

#### **STM 398T. Supervised Teaching in Science, Technology, Engineering, and Mathematics Education.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing and appointment as a teaching assistant or assistant instructor in science, technology, engineering, and mathematics education.

### **STM 399R, 699R, 999R. Dissertation.**

Science-Mathematics Education 399R, 699R, 999R and Science, Technology, Engineering, and Mathematics Education 399R, 699R, 999R may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing; consent of the graduate adviser; and admission to candidacy for the doctoral degree in science, technology, engineering, and mathematics education.

### **STM 399W, 699W, 999W. Dissertation.**

Science-Mathematics Education 399W, 699W, 999W and Science, Technology, Engineering, and Mathematics Education 399R, 699R, 999R may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Science, Technology, Engineering, and Mathematics Education 399R, 699R, or 999R.

## **Special Education**

*Master of Arts  
Master of Education  
Doctor of Philosophy  
Doctor of Education*

### **For More Information**

**Campus address:** George I. Sánchez Building (SZB) 306, phone (512) 471-4161, fax (512) 471-2471; campus mail code: D5300

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Special Education, 1912 Speedway Stop D5300, Austin TX 78712

**E-mail:** [stephilltownsend@austin.utexas.edu](mailto:stephilltownsend@austin.utexas.edu)

**URL:** <http://www.edb.utexas.edu/education/departments/sped/>

### **Facilities for Graduate Work**

The University has an array of facilities that offer outstanding opportunities for research and study. Students may work with individual faculty members, many of whom have obtained external funding for research, development, training, and model demonstration projects involving the Texas Education Agency and school districts throughout Texas. In addition, students may work cooperatively with faculty members affiliated with the Assistive and Instructional Technology Laboratory, the Office of Bilingual Education, the Meadows Center for Preventing Educational Risk, and the Vaughn Gross Center for Reading and Language Arts. The Perry-Castañeda Library contains extensive holdings in special education and related fields. Students also have access through the University Libraries Web site (<http://www.lib.utexas.edu>) to electronic databases, journals, and books related to special education. The College of Education's Learning Technology Center provides access to a wide range of hardware and software useful for instructional development and for research. Practicum and internship opportunities are provided by a number of local schools, state facilities, and community agencies.

### **Areas of Study**

The Department of Special Education offers master's degrees in four areas of specialization: autism and developmental disabilities; early childhood special education; mild/moderate disabilities and diversity; and rehabilitation counseling. The doctoral degree is offered in five areas of specialization: autism and developmental disabilities; early childhood special education; learning disabilities/behavioral disorders; multicultural special education; and rehabilitation counseling. Graduate study prepares students for leadership roles in fields that serve children, youth, adults with disabilities, and their families. Students may also complete coursework to fulfill requirements for a post-baccalaureate

special education teaching certificate, or for certification as a behavior analyst. Although there is considerable overlap between degree and certification requirements, additional courses beyond the degree plan are usually necessary.

**Master's degree program.** The master's degree prepares students to provide behavior analysis, special education, or rehabilitation counseling services to individuals with disabilities and their families. Through coursework and field-based experiences, students acquire knowledge and skills in the areas of disabilities, advocacy, collaboration, instruction and assessment, and professional standards of legal and ethical practice, and in the sociocultural, linguistic, economic, and technological contexts in which services are provided.

**Doctoral degree program.** The doctoral program prepares students to assume leadership positions in institutions of higher education and in local, state, and national agencies that provide services to individuals with disabilities and their families. The core areas of study focus on advocacy, leadership roles as members of the profession, standards of legal and ethical professional practice, and developing programs and services and/or conducting research that contribute to the quality of life for individuals with disabilities and their families. Students also develop the foundation for ongoing professional development and an appreciation of the sociocultural, linguistic, economic, and technological contexts that shape the development and delivery of services.

### **Areas of Specialization**

**Autism and developmental disabilities** provides opportunities for students to develop skills in designing, implementing, and evaluating educational interventions for people with autism and developmental disabilities.

**Early childhood special education** focuses on the development of early intervention programs for children from birth through six years of age, reflecting a family-centered philosophy and application of the most recent theoretical concepts in natural and inclusive settings.

**Learning disabilities/behavioral disorders** is a doctoral area of specialization that provides advanced coursework in contemporary trends and issues in learning disabilities and behavioral disorders. Students learn ways to conduct theoretically-driven research that addresses important issues pertinent to the major field including developing, implementing, and evaluating instructional and behavioral interventions and exploring the impact of assistive technologies on learning. Students participate in research-based experiences that help prepare them for instructional and/or leadership roles, and for conducting independent empirically-based research in the major field.

**Mild/moderate disabilities and diversity** is a master's area of specialization that focuses on developing, implementing, and evaluating educational, behavioral, and technology-based interventions for students from diverse backgrounds with mild or moderate learning and behavioral disabilities. Students apply their knowledge and skills from coursework in field-based experiences, including clinical- and school-based settings.

**Multicultural special education** is a doctoral area of specialization that focuses on critical issues, knowledge, and skills related to the complex relationships between culture, race and ethnicity, language, and disability. This specialization is designed to prepare students for leadership roles in the provision of culturally and linguistically responsive educational services for exceptional children and youth from diverse backgrounds.

**Rehabilitation counseling** is designed to prepare students to counsel youth and adults with disabilities who are experiencing difficulties related to personal and vocational adjustment.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Marcia Barnes	Barbara L Pazez
Brian R Bryant	Sarah Rannels Powell
Diane P Bryant	James L Schaller
North A Cooc	Audrey M Sorrells
Terry S Falcomata	Sylvia F Thompson
Andrea Lynn Flower	Jessica R Toste
Mark F O'Reilly	Sharon Vaughn
James R Patton	Nina Isabel Zuna

## Degree Requirements

**Master of Arts.** The Master of Arts degree is offered in all master's concentrations. The Master of Arts degree requires at least thirty-six semester hours of coursework, including six hours for researching and writing a thesis. The general requirements for the master's degree set a minimum standard. Information about additional requirements is available from the graduate adviser or coordinator.

**Master of Education.** Two Master of Education degree plans are available in each master's concentration. The Master of Education degree with report requires at least thirty-six semester hours of coursework, including three hours for preparing the report. The Master of Education degree without thesis or report requires at least thirty-six semester hours of coursework. The general requirements for the master's degree set a minimum standard. Information about additional requirements is available from the graduate adviser or coordinator.

**Doctor of Philosophy.** Because the Doctor of Philosophy is a research degree, the program is structured to provide students with both academic and practical experience in conducting research in educational settings, clinics, and other research settings. Degree plans focus on students' areas of specialization; research; interdisciplinary studies; and professional skills related to research, teaching, and service. The dissertation is expected to be a theoretically-based piece of original research that contributes to knowledge in special education or rehabilitation counseling. In addition to coursework, all students are expected to become actively involved in a variety of professional activities, such as supervision of student teachers, conference presentations, publications, and college teaching.

**Doctor of Education.** Although the requirements for this degree are similar to those for the Doctor of Philosophy, the Doctor of Education emphasizes applied research, and the program is designed to prepare students for leadership roles in a variety of educational settings. Requirements include a focus on program evaluation, organizational decision-making, policy and law, and personnel preparation. The Doctor of Education dissertation may be a theoretically-based piece of original research; it may also represent a scholarly investigation in special education or rehabilitation counseling that contributes to policy development, professional practice, or both. Graduates are prepared to assume leadership roles at the district, state, or national agency levels.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also

reflect changes made to the course inventory after the publication of this catalog.

## Special Education: SED

### SED 380. Multicultural Special Education.

Study of critical issues in culture, language, and disability. Three lecture hours a week for one semester. Special Education 380 and 393 may not both be counted unless the topics vary. Special Education 380 and 395 may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; twelve semester hours of upper-division coursework in education, psychology, sociology, or other behavioral sciences; and consent of instructor; additional prerequisites vary with the topic.

**Topic 1: Language Acquisition and Assessment in Multicultural Special Education.** Language acquisition among culturally and linguistically diverse learners in general and special education, with emphasis on effective assessment and instruction.

**Topic 4: Assessment in Multicultural Special Education.** Cultural and linguistic factors related to the assessment of language-minority students; the best practices in psychoeducational procedures.

**Topic 6: Advanced Research Topics in Multicultural Special Education.** Current and emerging research on individuals with disabilities who are from culturally and linguistically diverse backgrounds. Provides students with opportunities to review research literature on topics of interest to them, and to explore their writing skills. A process approach to writing is used to familiarize students with the APA guidelines for preparing scholarly manuscripts.

**Topic 7: Cross-Cultural Interactions in Multicultural Special Education.** Introduction to principles of intercultural communication for educators. Emphasis on strategies for effective cross-cultural communication in a variety of educational settings, including general and special education.

**Topic 8: School-Community Relations in Multicultural Special Education.** Traditional methods of parent and school relations; emerging and innovative models for communication between the school and the community; the intent of the course is to explore school-community interactions in the context of the dynamics of culture, race, language, politics, history, economics, and religion.

**Topic 9: Development of Personnel Preparation and Programming in Multicultural Special Education.** Designed to prepare students to develop standards-based multicultural personnel preparation programs that emphasize research-based practices and that improve student outcomes and promote recruitment, retention, and quality of personnel for teaching culturally and linguistically diverse populations with disabilities in pluralistic settings.

**Topic 10: Cultural and Linguistic Diversity in Special Education and Rehabilitation Counselor Education.** An overview of issues, problems, and emerging practices related to culturally and linguistically diverse students served in special education.

**Topic 11: Educational Planning for Multicultural Special Education.**

**Topic 12: Educational Leadership in Multicultural Special Education.** Overview of issues affecting equal access to quality education for culturally and linguistically diverse learners with disabilities.

**Topic 13: Sociocultural Foundations of Special Education.** An in-depth examination of key knowledge, including sociocultural theory and conceptual models, used in teaching culturally and linguistically diverse students with disabilities in special education and inclusive settings.

**Topic 14: Cultural and Linguistic Diversity in Special Education and Rehabilitation Counselor Education.** An overview of issues, problems, and emerging practices related to culturally and linguistically

diverse students served in special education. Web-based instruction. No class meetings.

### **SED 383. Learning Disabilities.**

Nature and concomitant results of minimal brain damage as it affects the characteristics and learning behavior of children; assessment and appraisal instruments; and activities and materials for stimulation of learning. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; twelve semester hours of upper-division coursework in education, psychology, or other behavioral sciences, including a course in special education; and consent of instructor; additional prerequisites vary with the topic.

**Topic 1: Introduction to Learning Disabilities.** Basic terms and definitions, the nature of specific learning disorders, theoretical models, and empirical classification systems.

**Topic 6: Teaching Students with Dyslexia and Reading Difficulties.** Theories and practices associated with dyslexia; terminology, assessment, and remedial strategies are emphasized.

**Topic 7: Assessment in Special Education.** The basic concepts related to the assessment of exceptional individuals.

**Topic 8: Instructional Adaptations I.** Design, implementation, and evaluation of instruction for elementary- and secondary-level students with mild to moderate disabilities who receive special education services.

**Topic 9: Instructional Adaptations II.** Issues in the education of students with mild to moderate disabilities, including assessing students, evaluating instruction and instructional materials, and adapting and implementing instruction.

### **SED 384. Early Childhood Special Education.**

Education variables related to educational services and research for young children are investigated in terms of etiology, assessment, curriculum models, educational settings, and interdisciplinary programming. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; twelve semester hours of upper-division coursework in education, psychology, or other behavioral sciences, including a course in special education; and consent of instructor; additional prerequisites vary with the topic.

**Topic 1: Overview of Early Childhood Special Education.** The educational and emotional needs of young disabled children (birth to age six) and the techniques for implementing a "whole child" educational approach to meet the needs of the child and the family.

**Topic 3: Parent Education Models.** The grief stages of parents; parent involvement models available to promote optimum parent-child and parent-professional relationships.

**Topic 4: Introductory Practicum in Early Childhood Special Education.** Teaching experience with disabled children in a center setting. Assessment and curriculum procedures are applied in developing an appropriate education for an individual child or small groups of children.

**Topic 5: Advanced Practicum in Early Childhood Special Education.** Teaching experience with a large group of children in a center setting. Program management and evaluation procedures are applied to a total curriculum, so that the student assumes a lead teacher and/or consultant role during training.

**Topic 6: Assessment and Programming of Early Childhood Special Education.** Experience in assessing a disabled child in a naturalistic setting. Formal and informal assessment procedures for children from birth through age six.

**Topic 7: Medical/Educational Overview: Birth to Age Three.** Overview of hospital-to-school early intervention techniques for meeting the medical and educational needs of preterm, low-birth-weight, and at-risk children and their parents.

**Topic 8: Medical/Educational Parent Education and Involvement: Birth to Age Three.** Research, design, and implementation of a functional child-parent program. Students develop their own programs for working with parents of children with specific problems or disabilities.

**Topic 9: Medical/Educational Assessment: Birth to Age Three.** Experience planning, assessing, and implementing educational programs for at-risk infants and toddlers. Emphasis is on interagency coordination and the use of the transdisciplinary team to meet the family's and the child's needs with a minimum of personnel.

**Topic 10: Medical/Educational Programming: Birth to Age Three.** Medical information on pre-, peri-, and postnatal effects of medical problems and extended hospital stays. Impact of medical intervention on the infant's and the family's development.

**Topic 11: Medical/Educational Practicum in Early Childhood Special Education.** Early intervention in a neonatal intensive care unit or on a follow-up team for medically fragile high-risk children.

**Topic 12: Overview of Early Childhood Special Education.** The educational and emotional needs of young disabled children (birth to age six) and the techniques for implementing a "whole child" educational approach to meet the needs of the child and the family. Web-based instruction. No class meetings.

**Topic 13: Early Language Intervention.** Web-based instruction. No class meetings.

**Topic 14: Family Support and Intervention.** Web-based instruction. No class meetings.

**Topic 15: Assessment and Programming of Early Childhood Special Education.** Experience in assessing a disabled child in a naturalistic setting. Formal and informal assessment procedures for children from birth through age six. Web-based instruction. No class meetings.

**Topic 16: Medical and Educational Assessment and Intervention.** Web-based instruction. No class meetings.

**Topic 17: Functional Motor and Vision Assessment and Intervention.** Web-based instruction. No class meetings.

### **SED 386. Behavioral Disorders.**

Discussion of behavioral disorders, contributory factors; psychological and educational diagnoses applied to educational programming. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; twelve semester hours of upper-division coursework in education, psychology, or other behavioral sciences, including a course in special education; and consent of instructor; additional prerequisites vary with the topic.

**Topic 10: Introduction to Behavioral Disorders.** Introduction to the nature and needs of children with behavior disorders and to effective management methods and teaching strategies. The admission, review, and dismissal process is described and practiced so that students can work as members of an interdisciplinary team.

**Topic 11: Foundations of Positive Behavioral Support and Classroom Management.** Study of the basic principles of human behavior, and the application of those principles to teaching positive behavior support and designing effective classrooms. Designed to prepare teachers and clinicians who will be in general and special education settings with children of all ages with and without disabilities.

**Topic 12: Designing Effective Systems of Behavioral Support in Schools.**

**Topic 13: Educating Students with Significant Behavioral Support Needs.** Designed to provide students with an overview of promising and preferred practices for educating children and youth with emotional and behavioral disorders (EBD). Emphasis on children and youth whose behaviors challenge the prevailing social and educational traditions and values of schools, communities, and families.



### **SED 387. Rehabilitation Counseling.**

Study of rehabilitation counseling: basic orientation and process and procedures; related biomedical, psychological, and community aspects; specialized programs and field experiences. Three lecture hours a week for one semester; or meetings as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; twelve semester hours of upper-division coursework in education, psychology, sociology, or other behavioral sciences; and consent of instructor; additional prerequisites vary with the topic.

**Topic 1: Introduction to Rehabilitation Counseling.** Orientation to rehabilitation; historical developments, philosophy, disability, legal basis, organizational structure, facilities, and related professions. Field visitations.

**Topic 2: Adjustment to Disabling Conditions and Illness.** Psychodynamic principles of adjustment to disability, individual perception of illness, and motivation for recovery; including somatopsychological and psychosomatic aspects.

**Topic 3: Medical/Paramedical Aspects of Rehabilitation Counseling.** Contributions of the medical profession; terminology, etiology, prognosis, therapeutic services, restorative techniques, and assessment of limitations and capacities in typical disabilities.

**Topic 4: Rehabilitation Counseling Process and Procedures.** Systematic study of the rehabilitation counseling process, including required basic counselor skills, techniques, services, community resources, and professional ethics.

**Topic 5: Prepracticum in Rehabilitation Counseling.** Supervised, field-based observation and experience in rehabilitation counseling. Three lecture hours a week for one semester, with additional hours to be arranged.

**Topic 6: Practicum in Rehabilitation Counseling.** Individually supervised and systematically organized participation in rehabilitation counseling, case management, and professional skill development. Additional prerequisite: Consent of instructor.

**Topic 7: Specialized Problems in Rehabilitation Counseling.** Intensive study of specialized problems related to specific disability groups, counseling methods, and concepts in vocational placement.

**Topic 8: Supervised Clinical Practice in Rehabilitation Counseling.** Supervised clinical experience in rehabilitation settings; integration of theory and practice through supervision of experience, seminars, and individual conferences.

**Topic 9: Rehabilitation Counseling Theories.** Current rehabilitation counseling theories with specific applications in rehabilitation settings. Current issues in rehabilitation counseling, case management, planning, and service delivery for specific disability groups.

**Topic 11: Vocational Assessment and Job Placement.** The application of career development and job placement concepts to people with disabilities. Occupational choice, vocational counseling, occupational aspects of disability, pertinent laws and regulations.

**Topic 14: Group Counseling in Rehabilitation Counseling.** Basic issues and key concepts of the group process. Analysis of the therapeutic process, stages of development, and practices.

**Topic 15: Case Management in Rehabilitation Counseling.** Management aspects of the rehabilitation counselor's job, including writing job descriptions; applying the selection and appraisal processes; applying civil rights laws that affect services to disabled persons; using the five functions of management; and working in a re-engineered environment.

**Topic 16: Rehabilitation Counseling Theories.** Web-based instruction. No class meetings.

**Topic 17: Specialized Problems in Rehabilitation Counseling.** Intensive study of specialized problems related to specific disability groups, counseling methods, and concepts in vocational placement. Web-based instruction. No class meetings.

**Topic 18: Vocational Assessment and Job Placement.** The application of career development and job placement concepts to people with disabilities. Occupational choice, vocational counseling, occupational aspects of disability, pertinent laws and regulations. Web-based instruction. No class meetings.

**Topic 19: Introduction to Rehabilitation Counseling.** Web-based instruction. No class meetings.

**Topic 20: Adjustment to Disabling Conditions and Illness.** Psychodynamic principles of adjustment to disability, individual perception of illness, and motivation for recovery; including somatopsychological and psychosomatic aspects. Web-based instruction. No class meetings.

**Topic 21: Prepracticum in Rehabilitation Counseling.** Supervised, field-based observation and experience in rehabilitation counseling. Web-based instruction. No class meetings.

**Topic 22: Medical/Paramedical Aspects of Rehabilitation Counseling.** Contributions of the medical profession; terminology, etiology, prognosis, therapeutic services, restorative techniques, and assessment of limitations and capacities in typical disabilities. Web-based instruction. No class meetings.

**Topic 23: Practicum in Rehabilitation Counseling.** Individually supervised and systematically organized participation in rehabilitation counseling, case management, and professional skill development. Web-based instruction. No class meetings.

### **SED 388. Autism and Developmental Disabilities.**

An intensive study of the psychological, sociological, physiological, and educational factors relating to the assessment, learning styles, and teaching of children with autism and other developmental disabilities. Includes affective, cognitive, and psychomotor development of the physically disabled and those with multiple developmental disabilities. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; twelve semester hours of upper-division coursework in education, psychology, or other behavioral sciences, including a course in special education; and consent of instructor; additional prerequisites vary with the topic.

**Topic 3: Teaching Individuals with Autism and Developmental Disabilities.** Development of highly specialized skills needed to teach those with developmental disabilities. Emphasis is on the basic principles of learning that underlie effective instructional strategies and on ways to structure the environment to promote learning.

**Topic 5: Enhancing Communication Potential in People with Autism and Developmental Disabilities.** Communication intervention for those with developmental disabilities. Designed to help students learn to assess communication behavior and to create intervention programs that enhance existing communication skills and teach new skills. Hands-on experience with a variety of augmentative and alternative communication systems.

**Topic 6: Educational Implications of Autism and Developmental Disabilities.** Introduction to the learning and behavioral characteristics of those with developmental disabilities, including autism and related developmental disorders. Designed to give students an understanding of the educational needs of those with developmental disabilities and of ways to address those needs through special education and related services.

**Topic 7: Challenging Behavior and Developmental Disabilities.** The nature, assessment, and treatment of the challenging behaviors that are prevalent in individuals with developmental disabilities, such as aggression, self-injury, property destruction, tantrums, and stereotyped movements.

**Topic 8: Research on Inclusion for Students with Autism and Developmental Disabilities.** Literature relevant to the inclusion of students with developmental disabilities, including classic readings on the history and philosophy of inclusion; analysis of the evidence

supporting current best-practice models. Emphasis on critical reading of empirical studies on the efficacy of inclusive education.

**Topic 9: Assessment Research in Autism and Developmental Disabilities.** Research related to the assessment of students with developmental disabilities, examined in the context of the theoretical orientations that underlie the major assessment strategies. Includes a review of studies related to the development and validation of contemporary assessment instruments and discussion of the scientific process involved in developing and validating assessment tools.

**Topic 10: Advances in the Understanding and Treatment of Autism.** Review of recent advances in the understanding and treatment of autism and related developmental disorders. The social forces that shape research and scientific understanding and the political forces that influence the delivery of education and related services, as well as implications for effective leadership in special education.

**Topic 11: Intervention Research in Autism and Developmental Disabilities.** How research is used to develop interventions for those with developmental disabilities. Students consider the role of basic research and theory in the development of interventions and the use of experimental design to demonstrate the effectiveness of an intervention program, explore the development of empirically validated intervention programs, and undertake qualitative and quantitative reviews of intervention research.

**Topic 12: Challenging Behavior and Developmental Disabilities.** The nature, assessment, and treatment of the challenging behaviors that are prevalent in individuals with severe and multiple disabilities such as aggression, self-injury, property destruction, tantrums, and stereotyped movements. Web-based instruction. No class meetings.

### **SED 389. Special Education Administration.**

Study of the content and process of special education administration, including technological forecasting methods, case law as it applies to people with disabilities, management of problem employee styles, and related topics. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; twelve semester hours of upper-division coursework in education, psychology, or other behavioral sciences, including a course in special education; and consent of instructor.

#### **Topic 1: Administration of Special Education Programs.**

Application of principles of administration and leadership to problems associated with special education and instruction for special populations.

**Topic 2: Educational Futures.** Students are directed toward career goals: affective change toward the future and change processes; acquisition of knowledge about several technological forecasting methods and of skill in the use of one method.

#### **Topic 3: Special Education Administration Seminar: Current Issues in Special Education.**

**Topic 4: Law and Disabilities.** An examination of case law that covers definitions, equal educational opportunity, employment, accessibility, freedom of choice, freedom from residential confinement, housing and zoning restrictions, equal access to medical services, procreation, marriage, children, contracts, ownership and transfer of property, voting, and holding public office.

**Topic 5: Special Populations.** Leadership issues associated with serving school-age children through federal and state "title" programs, including English as a second language, bilingual education, and Chapters I and II. Also covered are alternative schools; programs for juvenile offenders, pregnant students and young mothers, and at-risk students such as those who have potential for suicide; and services for the homeless, the abused, and chemical abusers. Students read the significant literature and develop knowledge and skill in planning and designing delivery models.

### **SED 393. Graduate Seminar in Special Education.**

Discussion of critical issues; critiques of literature; development of theories and models regarding disabling conditions. The equivalent of three class hours a week for one semester. Special Education 380 and 393 may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; twelve semester hours of upper-division coursework in education, psychology, or other behavioral sciences; and consent of instructor.

#### **Topic 5: Applied Research in Special Education and Rehabilitation Counseling.**

**Topic 13: Issues in Special Education.** Issues and challenges affecting decision-making and practices by special education teachers, general education teachers, assessment personnel, and school administrators in the treatment and education of students with disabilities. The primary goal is to advance students' understanding of the contributions of history, legislation, policy, research, practice, and recent trends as they apply to the resolution of major issues in special education and programs for students with disabilities.

**Topic 17: Instructional Designs Using Assistive Technology.** The design of instruction for students with disabilities by using assistive and instructional technologies.

**Topic 18: Collaboration.** Strategies such as collaborative consultation and teamwork models, which are used to improve learning outcomes for students with diverse learning needs.

**Topic 19: Applied Research in Special Education and Rehabilitation Counseling.** Web-based instruction. No class meetings.

### **SED 394, 694. Practicum in Special Education.**

Supervised field placement in specialized settings serving exceptional children and youth. Conference course. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **SED 395. Independent Study.**

Individual research planned, executed, and reported under supervision. Conference course. Special Education 380 and 395 may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Admission to an approved program of graduate study or to candidacy for the doctoral degree in education, or graduate standing and consent of instructor; additional prerequisites vary with the topic.

**Topic 1: Independent Study in Special Education Administration.**

**Topic 2: Independent Study in Behavioral Disorders.**

**Topic 4: Independent Study in Learning Disabilities.**

**Topic 6: Independent Study in Rehabilitation Counseling.**

**Topic 7: Independent Study in Early Childhood Special Education.**

**Topic 8: Independent Study in Autism and Developmental Disabilities.**

**Topic 15: Independent Study in Multicultural Special Education.**

### **SED 395D. Doctoral Seminar in Special Education and Rehabilitation Counselor Education.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Admission to an approved program of graduate study or to candidacy for the doctoral degree in education, and consent of instructor; additional prerequisites vary with the topic.

**Topic 1: Special Education Administration.**

**Topic 2: Behavioral Disorders.**

**Topic 3: Learning Disabilities.**

**Topic 4: Rehabilitation Counseling.**

**Topic 5: Early Childhood Special Education.**

**Topic 6: Autism and Developmental Disabilities.**

### **Topic 7: Multicultural Special Education.**

#### **SED 695S. Professional Seminar.**

Forum for students to become familiar with the areas of study, research, and professional practice within special education. Students also refine their professional writing and communication skills, critically evaluate current and emerging research in the field, and examine the historical, legal, philosophical, and theoretical foundations of special education. Three lecture hours a week for two semesters. Required of all doctoral students. Prerequisite: For 695SA, graduate standing and admission to the doctoral program in special education; for 695SB, Special Education 695SA.

#### **SED 696. Research Mentoring.**

Designed to develop the knowledge and skills students need in order to conduct research. Under the supervision of a three-member committee, students develop a publishable-quality synthesis of the professional literature on a topic related to their research interests. Conference course. Required of all doctoral students prior to admission to candidacy. Offered on the credit/no credit basis only. Prerequisite: For Special Education 696A, graduate standing, completion of specialization core requirements, at least three graduate courses in research methods and data analysis, and consent of the graduate adviser; for Special Education 696B, 696A.

#### **SED 396C. Trends and Issues in Special Education and Rehabilitation Counseling.**

An examination of current trends and issues in areas within special education and rehabilitation counselor education that influence policies and procedures in the public schools, teacher preparation programs, and community agencies. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; twelve semester hours of upper-division coursework in education, psychology, sociology, or other behavioral sciences; and consent of instructor; additional prerequisites vary with the topic.

**Topic 1: Trends and Issues in Early Childhood Special Education.**

**Topic 2: Trends and Issues in Learning Disabilities/Behavioral Disorders.**

**Topic 4: Trends and Issues in Rehabilitation Counselor Education.**

**Topic 5: Trends and Issues in Special Education Administration.**

**Topic 7: Trends and Issues in Autism and Developmental Disabilities.**

#### **SED 396R. Research Methods and Data Analysis.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, twelve semester hours of upper-division coursework in education, and consent of instructor.

**Topic 1: Research Methodology in Special Education.**

**Topic 2: Single-Subject Research Design.** The use of single-subject research designs to make data-based decisions about program effectiveness and student outcomes; integration of applied research into classroom instruction as part of evidence-based professional practice in educating students with severe and multiple disabilities.

**Topic 3: Advanced Data Analysis in Special Education.**

#### **SED 396T. Directed Research in Special Education.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, twelve semester hours of upper-division coursework in education, and consent of instructor.

**Topic 1: Directed Research in Special Education Administration.**

**Topic 2: Directed Research in Behavioral Disorders.**

**Topic 4: Directed Research in Learning Disabilities.**

**Topic 6: Directed Research in Rehabilitation Counseling.**

**Topic 7: Directed Research in Early Childhood Special Education.**

**Topic 8: Directed Research in Severe and Multiple Disabilities.**

**Topic 13: Directed Research in Multicultural Special Education.**

#### **SED 397C. Advanced College Teaching.**

Supervised teaching experience at the college level. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing, admission to an approved program of graduate study or admission to candidacy for the doctoral degree in special education, Special Education 398T, and consent of the graduate adviser.

#### **SED 397P, 697P. Graduate Internship.**

Supervised practice in a professional position. The equivalent of three or six lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing, twelve semester hours of upper-division coursework in education, and consent of instructor.

#### **SED 397S. Supervised Teaching in Special Education.**

Instruction in the supervision of student teachers and observers at the undergraduate level. Conference course. Prerequisite: Graduate standing, appointment as a teaching assistant and supervisor of undergraduate student teachers, and consent of instructor.

#### **SED 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in special education and consent of the supervising professor and the graduate adviser; for 698B, Special Education 698A.

#### **SED 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in special education and consent of the graduate adviser.

#### **SED 398T. College Teaching in Special Education.**

Three lecture hours a week for one semester. Required for teaching assistants and assistant instructors. Prerequisite: Graduate standing.

#### **SED 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

#### **SED 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Special Education 399R, 699R, or 999R.

## **Cockrell School of Engineering Engineering**

*Master of Science in Engineering  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Ernest Cockrell Jr. Hall (ECJ) 10.322, phone (512) 471-7995; campus mail code: C2100

**Mailing address:** The University of Texas at Austin, Academic Affairs, Cockrell School of Engineering, 301 East Dean Keeton Stop C2100, Austin TX 78712-2100

**URL:** <http://www.engr.utexas.edu/>

## Areas of Study

Graduate work in engineering may lead to the Master of Science in Engineering or the Doctor of Philosophy in the following majors: aerospace engineering, biomedical engineering, chemical engineering, civil engineering, electrical and computer engineering, engineering mechanics, materials science and engineering, mechanical engineering, operations research and industrial engineering, and petroleum engineering. The Master of Science in Engineering is also offered in architectural engineering; in environmental and water resources engineering; and, through alternatively scheduled programs, in electrical engineering and engineering management. An integrated Bachelor of Science in Electrical Engineering/Master of Science in Engineering degree is also available in electrical engineering resulting in the simultaneous awarding of a Bachelor of Science in Electrical Engineering: Integrated Option (BSEE) degree, and a Master of Science in Engineering (MSE) degree. Information about the concentrations offered in each field is given in the program descriptions.

## Facilities for Graduate Work

The Cockrell School of Engineering has outstanding research and teaching facilities on the main campus and at the J. J. Pickle Research Campus. Details are given in the individual program descriptions.

## Alternatively Scheduled Programs

Several alternatively scheduled programs allow professionals to pursue the Master of Science in Engineering while working full time. Classes generally meet once a month on Fridays and Saturdays. Students may major in engineering management or in electrical engineering with a concentration in software engineering. Additional information about alternatively scheduled programs is published by the Center for Lifelong Engineering Education (<http://lifelong.engr.utexas.edu/degree>).

## Degree Requirements

### Master of Science in Engineering

This degree is offered in three options: with thesis, with report, and without thesis or report. All three options may not be available in any one field of study; information about the options in each of the fields is given in the program descriptions.

### Doctor of Philosophy

The Doctor of Philosophy is a research degree. The student pursues coursework approved by the Graduate Studies Committee in the field of specialization and in supporting work outside the major. Before admission to candidacy, the student is expected to pass qualifying examinations and to meet additional requirements established by the Graduate Studies Committee. Admission to candidacy must be approved by the committee and the graduate dean. A dissertation that is an original contribution to scholarship and is the result of independent investigation in the major area is required of every candidate.

## Dual Degree Programs

The Cockrell School offers two dual degree programs: one in mechanical engineering (manufacturing and decision systems engineering) and

business administration, and one in civil engineering and public affairs. More information is available from the graduate adviser in each program.

## Intercollegial Programs

Graduate engineering study may also be a component of the master's and doctoral degrees in computational science, engineering, and mathematics described in Intercollegial Programs (p. 402).

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## Engineering Studies: E S

### E S 197, 297, 397. Special Subjects in Engineering.

For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. With consent of instructor, may be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

## Aerospace Engineering

*Master of Science in Engineering  
Doctor of Philosophy*

## For More Information

**Campus address:** W. R. Woolrich Laboratories (WRW) 215D, phone (512) 471-7595, fax (512) 471-3788; campus mail code: C0600

**Mailing address:** The University of Texas at Austin, Graduate Program in Aerospace Engineering, Department of Aerospace Engineering and Engineering Mechanics, 1 University Station C0600, Austin TX 78712

**E-mail:** [ase.grad@mail.ae.utexas.edu](mailto:ase.grad@mail.ae.utexas.edu)

**URL:** <http://www.ae.utexas.edu/>

## Objectives

The aerospace engineering graduate program focuses on teaching and research in analytical, computational, and experimental methods in the areas of aerothermodynamics and fluid mechanics; solids, structures, and materials; structural dynamics; guidance and control; and orbital mechanics. The student may concentrate in any of these five areas. The objectives of the program are to enable the student to attain a deeper understanding of aerospace engineering fundamentals, a knowledge of recent developments, and the ability as a master's degree student to participate in research and as a doctoral degree student to conduct individual research. The goals are accomplished through coursework, seminars, and active research programs.

## Areas of Study and Facilities

**Aerothermodynamics and fluid mechanics.** This concentration involves study and research in experimental, theoretical, and computational aerodynamics, gas dynamics, turbulence, plasma dynamics, heat transfer, and combustion. Research is presently being conducted in nonequilibrium and rarefied gas flows, planetary atmospheres, turbulence control, shock-boundary layer interactions, thermal and glow-discharge plasmas, turbulent mixing/combustion, numerical methods for turbulent reacting flows, and advanced optical diagnostics and sensors. Facilities include Mach 2 and Mach 5 blowdown wind tunnels, a 1.25-second low-gravity

drop tower, a large anechoic chamber, a 15" x 20" water channel, a laser sensor laboratory, combustion facilities, a plasma engineering laboratory, and extensive laser and camera systems for advanced flow diagnostics. The excellent computational facilities include a variety of workstations, and access to very-large-scale, high-performance computers at the Texas Advanced Computing Center.

**Solids, structures, and materials.** This concentration involves study and research in mechanics of composite materials, fracture mechanics, micromechanics of materials, constitutive equations, mechanical behavior at high strain rates, structural analysis, and structural stability. Experimental facilities include equipment for static structural testing; digital data acquisition equipment; uniaxial and biaxial materials-testing machines; custom loading devices; environmental chambers; microscopes; photomechanics facilities; composites processing equipment; facilities for microstructural analysis; and high-speed imaging and high-strain-rate mechanical testing facilities. Computing facilities include workstations, high-performance computers, and networks of workstations.

**Structural dynamics.** This concentration involves study and research in theoretical, computational, and experimental structural dynamics, including aeroelasticity, rotor dynamics, morphing structures, adaptive structures, vibration and noise control, and computational techniques for very-large-scale vibration analysis. Computational and experimental facilities include high-performance shared- and distributed-memory multiprocessor systems, actuators, sensors, balances, and data-acquisition systems for structural testing, system identification, and control. Facilities for testing aeroelastic models on a whirl test stand or in a wind tunnel are also available.

**Guidance and control.** This concentration involves study and research in system theory, control theory, optimal control theory, time-delay observers, estimation theory, and stochastic control theory, and the application of these theories to the navigation, guidance, control, and flight mechanics of aerospace vehicles. Research is primarily analytical and numerical in nature. Excellent computational and experimental facilities are available for the study of various guidance and control applications.

**Orbital mechanics.** This concentration involves study and research in the applications of celestial mechanics, analytical dynamics, geophysics, numerical analysis, optimization theory, estimation theory, and computer technology to model the dynamic behavior of natural and artificial bodies in the solar system. Two areas of interest are satellite applications and spacecraft design.

Satellite applications involve the study of active and passive satellite remote sensing for research in earth, ocean, atmospheric, and planetary science; satellite positioning, primarily using the Global Positioning System (GPS) for earth science research; and satellite tracking and instrumentation, including altimeters, for a variety of geophysical and geodetic studies, including the study of Earth's gravity field and rotation. Research is supported by a large database of satellite remote sensing measurements, a variety of computer resources, GPS receivers, and image processing equipment.

Spacecraft design involves the application of all disciplines of aerospace engineering to the design of aerospace vehicles, missions, and related systems. Experimental facilities include a satellite laboratory containing high-gain antennas for satellite tracking and a clean room area for fabrication and testing of space flight hardware. Research is primarily applied in nature and involves the synthesis of information from all engineering disciplines, mathematics, the natural sciences, economics, project management, and public policy.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Behcet Acikmese	Chad M Landis
Maruthi R Akella	Kenneth M Liechti
Efstathios Bakolas	Nanshu Lu
Jeffrey K Bennighof	Mark E Mear
Srinivas V Bettadpur	J T Oden
Tan T Bui	Laxminarayan L Raja
Noel T Clemens	Krishnaswa Ravi-Chandar
Clinton N Dawson	Gregory J Rodin
Leszek F Demkowicz	Ryan P Russell
John Timothy Foster	Bob E Schutz
Wallace T Fowler	Jayant Sirohi
David B Goldstein	Byron D Tapley
Rui Huang	Charles E Tinney
Thomas J Hughes	Philip L Varghese
Todd E Humphreys	Mary F Wheeler
Stelios Kyriakides	

## Admission Requirements

The prerequisite for graduate study in aerospace engineering is a bachelor's or master's degree in aerospace engineering or in a related field of engineering or science. Graduate study in orbital mechanics is possible for those with degrees in engineering, science, or mathematics.

## Degree Requirements

### Master of Science in Engineering

Students seeking the master's degree have three options, each requiring a total of thirty semester hours of credit. The thesis option requires twenty-four semester hours of coursework plus six hours in the thesis course.

The report option requires twenty-seven hours of coursework plus three hours in the report course. The option without a thesis or report requires thirty semester hours of coursework. Students receiving financial aid through the sponsorship of the department are expected to choose the thesis option. The report option and the option without a thesis or report each can be completed in one year.

Regardless of the option chosen, a student is required to take six hours of supporting coursework outside of their technical area. Only courses completed on the letter-grade basis may be counted toward the degree. Only three hours of business-related courses may be counted. Students may count no more than six hours of upper-division undergraduate coursework toward the degree.

The following is a template for the student beginning the thesis option in a fall semester. A student who follows this schedule and maintains at least a 3.00 grade point average will be considered to be making satisfactory progress toward the degree.

1. Take courses during the fall and spring semesters and begin research.
2. Complete research for thesis during the summer.
3. Complete coursework in the second fall semester.
4. Write thesis and graduate within one and one-half years.

### Doctor of Philosophy

The PhD program consists of coursework, qualifying examinations, and the dissertation. Students who have master's degrees must complete at least twenty-four hours of coursework; those who enter the graduate

program with bachelor's degrees must complete at least forty-eight hours of coursework.

To be admitted to candidacy for the Doctor of Philosophy degree, the student must pass both a written and an oral examination. The written examination is general in nature and covers subject matter studied through the first year of graduate work. The oral examination is in the student's specialty area and is conducted by a committee of faculty members whose interests are in that area. Students may not take courses on the credit/no credit basis until they have passed the written qualifying examination.

The following is a template for the student with a Master of Science in Engineering degree who begins the doctoral degree program in a fall semester. A student who follows this schedule and maintains at least a 3.00 grade point average will be considered to be making satisfactory progress toward the degree.

1. Take courses during the fall and spring semesters and begin research.
2. Pass the written qualifying exam during the summer.
3. Pass the oral qualifying exam soon after the written exam.
4. Apply for candidacy before the end of the second fall semester.
5. Continue research for the next two years.
6. Write the dissertation and graduate within five years.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Aerospace Engineering: ASE

#### ASE 380P. Mathematical Analysis for Aerospace Engineers.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Analytical Methods I.** Introduction to modern mathematics, real analysis of functions of one variable, linear algebra, elements of real analysis of functions of many variables, calculus of variations.

**Topic 2: Analytical Methods II.** Elements of complex analysis, Fourier and Laplace transforms, ordinary and partial differential equations, perturbation methods.

#### ASE 381P. System Theory.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Linear Systems Analysis.** Linear dynamical systems; controllability and observability; stability; realization theory; state-feedback and observers.

**Topic 2: Multivariable Control Systems.** Multivariable feedback systems; factorizations and controller parameterization; limitations and trade-offs of feedback; robust stability and performance; robust H<sub>2</sub> and H-infinity control methods. Additional prerequisite: Aerospace Engineering 381P (Topic 1) or the equivalent.

**Topic 3: Optimal Control Theory.** Necessary conditions and sufficient conditions for the parameter optimization and optimal control problems; engineering applications.

**Topic 4: Numerical Methods in Optimization.** Numerical methods for solving parameter optimization, suboptimal control, and optimal control problems.

**Topic 6: Statistical Estimation Theory.** Least squares; sequential and batch processors; optimal, linear, recursive, maximum likelihood, and minimum variance estimates; square-root filtering; filter divergence; discrete and continuous Kalman filters.

**Topic 7: Advanced Topics in Estimation Theory.** Estimation in the presence of unmodeled accelerations; nonlinear estimators; continuous estimation methods. Additional prerequisite: Aerospace Engineering 381P (Topic 6).

**Topic 8: Stochastic Detection, Estimation, and Control.** An investigation of linear and nonlinear estimation theory; hypothesis testing; Kalman filtering, smoothing, and Linear Quadratic Gaussian (LQG) problems; emphasis on applications. Additional prerequisite: Electrical Engineering 351K or the equivalent.

**Topic 12: Nonlinear Systems and Adaptive Control.** Analysis and synthesis of nonlinear control systems. Stability theory, parameter adaptive control, system identification, design principles. Aeromechanical systems. Additional prerequisite: Aerospace Engineering 381P (Topic 1) or the equivalent.

#### ASE 382Q. Fluid Mechanics.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Foundations of Fluid Mechanics.** Fundamental equations; constitutive equations for Newtonian fluids; inviscid, incompressible potential flow; viscous flow including exact solutions and boundary layer theory; compressible flow.

**Topic 7: Advanced Problems in Compressible Flow.** Physics and modeling of compressible fluids; types and structure of shock waves; heat conduction and secondary viscosity effects; exact nonlinear flow models.

**Topic 8: Lagrangian Methods in Computational Fluid Dynamics.** Particle-based methods of computational fluid dynamics: molecular dynamics, direct simulation Monte Carlo, cellular automata, lattice Boltzmann, particle in cell, point vortex, immersed boundary.

**Topic 9: Turbulent Mixing.** Fundamentals of turbulent scalar mixing relevant to turbulent combustion. Includes governing equations, mass diffusion, scalar transport, kinematics, chaotic advection, vortex dynamics, small-scale structure of vorticity and dissipative fields, scalar dissipation rate, scaling laws for canonical flows, heat release effects, and turbulent jet flame structure.

**Topic 10: Plasmas and Reactive Flows.** Fundamental description of plasmas and reactive flows. Includes derivation of common governing transport equations for a broad class of electrically conducting and nonconducting reactive gases, and electromagnetic field interactions with gases, gas-phase and surface kinetics, transport properties, and applications.

**Topic 11: Foundations of Computational Fluid Dynamics.** Higher-order numerical methods for solving partial differential equations and ordinary differential equations. Focus on the numerical computation of fluid flows, with a variety of scientific applications. Aerospace Engineering 382Q (Topic 11) and Aerospace Engineering 396 (Topic: Foundations of Computational Fluid Dynamics) may not both be counted.

#### ASE 382R. Aerodynamics.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 3: Hypersonic Aerodynamics.** Characteristics and assumptions of hypersonic flow; hypersonic similitude; Newtonian theory; constant density solutions.

**Topic 5: Advanced Computational Methods.** Development and implementation of numerical methods for solution of transport equations; computational grid generation; applications to fluid flows, including shock waves.

**Topic 6: Molecular Gas Dynamics.** Same as Mechanical Engineering 381Q (Topic 4: Molecular Gas Dynamics). Kinetic theory, thermodynamics, statistical mechanics. Applications: equilibrium gas properties, chemical kinetics, interaction of matter with radiation, rarefied gas dynamics. Additional prerequisite: Mechanical Engineering 326 or the equivalent.

**Topic 7: Optical Diagnostics for Gas Flows.** Fundamentals of nonintrusive flowfield diagnostics for aerodynamics and combustion. Basics of lasers and optical detectors; interferometric methods; Rayleigh, Raman, and Mie scattering; absorption spectroscopy; laser-induced fluorescence.

### **ASE 384P. Structural and Solid Mechanics.**

Three lecture hours or two lecture hours and three laboratory hours a week for one semester, depending on the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Solid Mechanics I.** Same as Engineering Mechanics 388. Mathematical description of stress, deformation, and constitutive equations of solid mechanics; boundary value problems of elasticity. Three lecture hours a week for one semester.

**Topic 2: Solid Mechanics II.** Same as Engineering Mechanics 388L. Continuation of Engineering Mechanics 388. Additional topics in elasticity, plasticity, viscoelasticity, variational methods, and other areas of solid mechanics. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Engineering Mechanics 388 or Aerospace Engineering 384P (Topic 1), and consent of instructor.

**Topic 3: Structural Dynamics.** Same as Engineering Mechanics 384L. Free and forced vibration of single-degree-of-freedom, multiple-degree-of-freedom, and continuous systems. Lagrange's equations and Hamilton's principle; discretization of continuous systems; numerical methods for response and algebraic eigenvalue problems. Three lecture hours a week for one semester.

**Topic 4: Finite Element Methods.** Same as Computational Science, Engineering, and Mathematics 393F and Engineering Mechanics 394F. Derivation and implementation of the finite element method; basic coding techniques; application to problems of stress and diffusion. Three lecture hours a week for one semester. Only one of the following may be counted: Aerospace Engineering 384P (Topic 4), Computational and Applied Mathematics 394F, Computational Science, Engineering, and Mathematics 393F, Engineering Mechanics 394F.

**Topic 6: Advanced Structural Dynamics.** Analysis of complex flexible systems; discretization of complex structures by the finite element method; advanced computational methods for large finite element models. Three lecture hours a week for one semester. Additional prerequisite: Aerospace Engineering 384P (Topic 3) or Engineering Mechanics 384L or the equivalent.

**Topic 8: Selected Topics in Aeroelasticity.** Classical and contemporary topics in aeroelasticity; general introduction to aeroelastic phenomena, including flutter, divergence, control reversal, and flexibility effects on stability and control; aeroelastic tailoring; active control concepts; unsteady aerodynamic theories for lifting surfaces and bodies; aeroelastic system identification, including nonlinear systems (theory and laboratory applications). Three lecture hours a week for one semester.

**Topic 11: Mechanics of Composite Materials.** Constitutive equations; micromechanical and macromechanical behavior of lamina; strength and stiffness in tension and compression, theory of laminated plates; strength of laminates; delamination. Three lecture hours a week for one semester.

### **ASE 387P. Flight Mechanics, Guidance, Navigation, and Control.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 2: Mission Analysis and Design.** Mission design and mission constraints, launch windows; rendezvous analysis; orbital design interactions with thermal and structural analysis; design of a typical mission.

**Topic 6: Optimal Spacecraft Trajectories.** Optimal control of spacecraft; primer vector theory; impulsive maneuvers; finite burn high/low thrust maneuvers; solar sails; numerical methods; applications to contemporary trajectory problems using single or multiple spacecraft.

**Topic 7: Sensors and Actuators.** Students use LabVIEW to study aerospace devices such as inertial navigation systems, control-moment gyroscopes, optical navigation systems, torque coils and magnetometers, robots, and integrated satellites.

### **ASE 388P. Celestial Mechanics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 2: Celestial Mechanics I.** N-body problem; three-body problem; restricted three-body problem; Jacobian integral; zero-velocity curves; equilibrium points; stability; linearized solutions; variational equations; periodic orbits; the two-body problem; variation of parameters; Lagrange's planetary equations; applications to near-earth and deep-space trajectories; numerical methods.

**Topic 3: Celestial Mechanics II.** Hamiltonian mechanics; dynamical systems; canonical transformations; invariant manifolds; Poincare surfaces of section; applications to restricted n-body problems; applications to sun-earth-moon or sun-planet-moon particle trajectory problems. Additional prerequisite: Aerospace Engineering 388P (Topic 2).

### **ASE 389P. Satellite Applications.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Determination of Time.** Concepts of time; fundamental reference system; polar motion; practical methods in time determination and dissemination; historical and present-day time scales; atomic clocks; time transfer via satellite.

**Topic 2: Satellite Geodesy.** Representations of planetary gravitational fields; determination of spherical harmonic coefficients; geoids and gravity anomalies; temporal variations in the geopotential; planetary rotational dynamics.

**Topic 4: Methods in Orbit Determination.** Includes the initial orbit determination (OD) problem; differential corrections; OD for mean elements and the prediction problem; OD problem formulation for low Earth orbit and planetary orbiters; measurement techniques and models, including oscillators, radio ranging and laser ranging methods. Three lecture hours a week for one semester. Aerospace engineering 389P (Topic 4) and 396 (Topic: Orbit Determination) may not both be counted.

**Topic 7: Global Navigation Satellite System Signal Processing.** Comprehensive review of the theory and applications of the Global

Positioning System (GPS), including the space segment, the control segment, the user segment, dilution of precision, GPS time, antispoofing, selected availability, differential/kinematic/dynamic techniques, field procedures, and GPS data collection and analysis. Applications of ground-based, aircraft-based, and satellite-based GPS receivers.

**Topic 8: Satellite Control Systems.** Spacecraft equations of motion; linearization and stability, classical control methods; digital and sampled data systems; multivariable control; attitude determination and control; momentum management; coupled modes; and case studies in satellite control.

**Topic 9: Synthetic Aperture Radar: Principles and Applications.** Synthetic Aperture Radar (SAR) imaging for Earth remote sensing, including image formation concepts and interpretation, radar interferometry processing and strategies, surface deformation, topographic mapping, and polarimetric applications.

### **ASE 396. Special Topics.**

The equivalent of three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **ASE 397. Graduate Seminar.**

Student, faculty, and visitor presentations of current research topics. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **ASE 397R, 697R. Research in Aerospace Engineering.**

Three or six hours of research a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **ASE 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in aerospace engineering and consent of the graduate adviser; for 698B, Aerospace Engineering 698A.

### **ASE 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in aerospace engineering and consent of the graduate adviser.

### **ASE 398T. Supervised Teaching in Aerospace Engineering.**

Teaching methods and objectives, criteria for evaluating teaching effectiveness, procedural rules and regulations, laboratory teaching. Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and appointment as a teaching assistant.

### **ASE 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **ASE 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Aerospace Engineering 399R, 699R, or 999R.

## **Architectural Engineering**

*Master of Science in Engineering*

The last class of students will be admitted to this program in fall 2015. Beginning spring 2016, students interested in pursuing a master's degree in Architectural Engineering are encouraged to consider options offered in the Civil Engineering degree program.

## **For More Information**

**Campus address:** Ernest Cockrell Jr. Hall (ECJ) 5.200, phone (512) 471-4921, fax (512) 471-0592; campus mail code: C1752

**Mailing address:** The University of Texas at Austin, Graduate Program in Architectural Engineering, Department of Civil, Architectural, and Environmental Engineering, 301 East Dean Keeton C1752, Austin TX 78712

**E-mail:** caee.grad@engr.utexas.edu

**URL:** <http://www.caee.utexas.edu/>

## **Objectives**

The objectives of the graduate program in architectural engineering are excellence in engineering education, research, and professional service. The program seeks to educate students to assume leadership positions in engineering practice, research, and education. The program also seeks to advance the state of the art and of the practice of architectural engineering at both fundamental and applied levels through extensive research programs, and to disseminate this research through professional and scholarly activities. The architectural engineering program encompasses construction engineering and project management, construction materials, building energy and environments, indoor air quality, building performance, and structural engineering. Students may also take courses in other disciplines, such as environmental and water resources engineering, geotechnical engineering, ocean engineering, mechanical engineering, and transportation engineering, and in interdisciplinary areas.

## **Facilities for Graduate Work**

The Architecture and Planning Library and the McKinney Engineering Library offer excellent reference facilities. Well-equipped laboratories, including the Phil M. Ferguson Structural Engineering Laboratory, are available in the areas of static and dynamic structural testing of building systems and structural elements of steel, reinforced and prestressed concrete, masonry, timber, and polymers. The structures laboratories, which include both architectural and civil engineering facilities, contain a wide range of loading machines and equipment, environmental chambers, and facilities for model testing. The virtual design laboratory provides state-of-the-art computer workstations. The construction laboratories include a well-equipped computer cluster on the main campus and a high-bay laboratory for construction automation research at the J. J. Pickle Research Campus. The automation laboratory includes a large-scale hydraulic robot test bed, a large rectilinear manipulator, and many computer workstations; at any one time, several full-scale prototyping projects are under way. The Construction Materials Research Group laboratory is equipped with facilities for proportioning and batching; for chemical, mechanical, and microstructural testing; and for durability evaluation of concrete and polymer concrete. The Building Energy and Environments research resources consist of five laboratories totaling 6,000 square feet of space devoted to building-related research. These laboratories are used for experiments using physical simulation systems, preparation for field studies, instrumentation calibration and maintenance, and analysis of samples collected in the field or laboratory. The laboratories contain a wide range of instruments and facilities for building energy analyses and indoor air quality research. Among the physical simulation systems are a 1,200-square-foot test house, three full scale test rooms with state-of-the-art environment control systems,



a variety of small chambers for testing emission from building materials, human simulators such as thermal manikins with breathing systems, and a family of wind tunnels for testing various components of heating ventilation and air conditioning systems (HVAC). Also available are the latest computer facilities.

## Areas of Study

Graduate study and research is offered in construction engineering and project management, construction materials, building energy and environments, building performance, indoor air quality, and structural engineering.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Joshua Apte	Howard M Liljestrand
Oguzhan Bayrak	Atila Novoselac
Carlos H Caldas	William J O'Brien
Richard L Corsi	James T O'Connor
Oforidike A Ezekoye	Michael E Webber
David W Fowler	Dan L Wheat
Todd A Helwig	Ying Xu
James O Jirsa	

## Degree Requirements

The following requirements for the Master of Science in Engineering degree with a major in architectural engineering are in addition to the general requirements for the master's degree. The thirty-semester-hour plan with thesis requires twenty-four hours in organized courses and six hours in the thesis course. Of the twenty-four hours of organized coursework, six to twelve hours may be in a minor area of concentration; the remaining twelve to eighteen hours must be in the major. The courses must be logically related and the program must be approved by the graduate adviser.

A thirty-semester-hour degree plan is also available under the report option, which includes a report prepared in Architectural Engineering 398R according to procedures set by the Graduate School; and under an option that includes a report prepared in Architectural Engineering 398D, or an approved program of coursework only, according to procedures set by the Graduate Studies Committee. Coursework in both architectural and civil engineering may be used to fulfill major area course requirements.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Architectural Engineering: ARE

#### ARE 381E. Design of Energy Efficient and Healthy Buildings.

Design of buildings for low energy use and optimal indoor air quality. Includes ventilation, energy efficiency, moisture problems, and prevention by design. Three lecture hours a week for one semester. Prerequisite: Graduate standing in engineering or graduate standing and consent of instructor.

#### ARE 382. Independent Studies in Architectural Engineering.

Investigation of problems in building construction, selected by the student with approval of the graduate adviser. The equivalent of three lecture hours a week for one semester. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in architectural engineering and consent of the graduate adviser.

**Topic 1: Construction and Project Management.** Offered on the credit/no credit basis only.

**Topic 2: Structures.** Offered on the credit/no credit basis only.

**Topic 3: Materials and Methods.** Offered on the credit/no credit basis only.

**Topic 4: Environmental Engineering.** Offered on the credit/no credit basis only.

**Topic 5: Design Principles and Procedures.** Offered on the credit/no credit basis only.

#### ARE 383. Research Studies in Architectural Engineering.

Three lecture hours a week for one semester, or the equivalent in conference hours, or as stated for the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Construction and Project Management.**

**Topic 2: Structures.**

**Topic 3: Materials and Methods.**

**Topic 4: Forensic Engineering: Materials and Structures.** Same as Civil Engineering 397F. Methods of forensic analysis; role of the expert witness; methods of dispute resolution; case studies; term project. Two lecture hours a week for one semester, with three laboratory hours a week for presentation of case studies.

**Topic 5: Advanced Masonry Engineering.** Properties of masonry, differential movement, construction operations, bearing wall systems, and case histories of failures.

**Topic 6: Design of Wood Members and Systems.** Same as Civil Engineering 397 (Topic 14: Design of Wood Members and Systems). Design and behavior of solid wood and glued-laminated wood structural members; light-frame and heavy timber systems, including trusses and arches.

**Topic 7: Evaluation, Materials, and Techniques for Concrete Repair.** Same as Civil Engineering 397 (Topic 16: Evaluation, Materials, and Techniques for Concrete Repair). Causes of distress, evaluation methods, repair materials, repair techniques, and quality control methods for repair of concrete. Three lecture hours a week for one semester, with one and one-half additional hours a week for guest speakers.

#### ARE 389H. HVAC Design.

Design of heating, ventilation, and air-conditioning systems. Three lecture hours a week for one semester. Prerequisite: Graduate standing and three of the following courses: Architectural Engineering 346N, Civil Engineering 319F, Mechanical Engineering 320, 326, 330, 339.

#### ARE 389T. Indoor Air Quality: Transport and Control.

Transport and control of indoor pollutants. Includes particulate removal and pollutant transport into and within indoor environments. Three lecture hours a week for one semester. Prerequisite: Graduate standing in architectural or civil engineering.

#### ARE 389U. Energy Simulation in Building Design.

Restricted to architectural engineering or civil engineering graduate students. Fundamentals of building energy simulations including basic analytical models for heat transfer in building elements and general numerical methods for solving system of equations. Use of energy simulation tools for building design analyses including parametric

studies. Three lecture hours a week for one semester. Only one of the following may be counted: Architectural Engineering 383 (Topic: Energy Simulation in Building Design), 389U, Civil Engineering 397 (Topic: Energy Simulation in Building Design). Prerequisite: Graduate standing, and Mechanical Engineering 320 or three semester hours of equivalent upper-division coursework in thermodynamics.

#### **ARE 389V. Modeling of Air and Pollutant Flows in Buildings.**

Same as Civil Engineering 389V. Restricted to architectural engineering or civil engineering graduate students. Fundamentals of indoor airflow modeling, use of computational fluid dynamics (CFD) for air quality and thermal comfort analyses, application of CFD for analysis of air velocity, temperature, humidity, and contaminant distributions with different ventilation systems. Three lecture hours a week for one semester. Only one of the following may be counted: Architectural Engineering 383 (Topic: Modeling of Air and Pollutant Flows in Buildings), 389V, Civil Engineering 389V, 397 (Topic: Modeling of Air and Pollutant Flows in Buildings). Prerequisite: Graduate standing; for architectural engineering and civil engineering majors, three semester hours of coursework in fluid dynamics; for others, consent of instructor.

#### **ARE 395P. Project Automation.**

Three lecture hours a week for one semester. Some topics may require additional hours; these are identified in the Course Schedule. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Advanced CAD Procedures.** Same as Civil Engineering 395P (Topic 1: Advanced CAD Procedures). Introduction to advanced CAD procedures and CAD systems, and their influence on building design and construction. Nine hours of lecture and laboratory a week for one semester. Additional prerequisite: An introductory CAD course.

**Topic 2: Introduction to Construction Automation and Integration.** Same as Civil Engineering 395P (Topic 2: Introduction to Construction Automation and Integration). Construction automation and integration activities, methods for opportunity identification and financial analysis of systems, and tools from several disciplines that are used in construction automation and integration; students prepare a project that synthesizes this information.

#### **ARE 395Q. Project Controls.**

Three lecture hours a week for one semester. Some topics require two lecture hours and three laboratory hours a week; these are identified in the Course Schedule. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

#### **ARE 395R. Project Information Systems.**

Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 5: Data Mining.** Same as Civil Engineering 395R (Topic 5: Data Mining). Fundamentals of data mining. Techniques for data classification, prediction, clustering, and association rules mining. Data mining as an advanced data analysis method in engineering and construction. Implementation issues.

#### **ARE 395S. Project Organization.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 4: Project Management.** Same as Civil Engineering 395S (Topic 4: Project Management). Overall aspects of project and portfolio management from inception to successful operation: project selection and feasibility, contracting methods, project scheduling, cost

control systems, project communications, project scope and quality management, human resource management, partner selection and management, project leadership, project closeout, and global project management.

#### **ARE 395T. Project Technology.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

#### **ARE 395U. General Topics in Construction Engineering and Project Management.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 3: Advanced Legal Concepts.** Same as Civil Engineering 395U (Topic 3: Advanced Legal Concepts). Contracts, documentation requirements, claims avoidance, and settlement of claims by alternative dispute resolution. Students conduct and present in-depth studies of the most frequent causes of claims (delay, disruption, acceleration, soil conditions, and changes) and consider the way the court establishes causation and determines damages.

#### **ARE 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in architectural engineering and consent of the graduate adviser; for 698B, Architectural Engineering 698A.

#### **ARE 398D. Departmental Report.**

Preparation of a report to fulfill the requirement for the Master of Science in Engineering degree under the departmental report option. Individual instruction. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in architectural engineering and consent of the supervising professor and the graduate adviser.

#### **ARE 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the Graduate School report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in architectural engineering and consent of the supervising professor and the graduate adviser.

## **Biomedical Engineering**

*Master of Science in Engineering  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Biomedical Engineering Building (BME) 3.308AF, phone (512) 475-8500, fax (512) 471-0616; campus mail code: C0800

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Biomedical Engineering, 107 W. Dean Keeton St. C0800, Austin TX 78712

**E-mail:** bme-grad@engr.utexas.edu

**URL:** <http://www.bme.utexas.edu/>

### **Objectives**

Graduate degrees in biomedical engineering have been offered by the University since 1974. The undergraduate degree program and the Department of Biomedical Engineering were established in 2001. The

department fosters a unique environment in which scholars and scientists may excel in both fundamental research and its translation to clinical applications.

The mission of the UT Austin graduate program in biomedical engineering is to educate students in the fundamentals of engineering and science as they affect biology and medicine and to perform multidisciplinary, disease-oriented research at the molecular, cellular, organ, and systemic levels. The program aims fully to integrate biology and engineering research and education at the graduate level.

The graduate program has more than a hundred students, with backgrounds in biology, chemistry, physics, and various engineering disciplines. Students come from all over the United States and the world to gain unique knowledge and experience. Apart from coursework and research in some of the world's premier laboratories, there are many opportunities for personal and professional development through interaction with industry professionals, conference attendance, and seminars with leaders in the field.

Doctoral and master's thesis students receive full financial support, either through teaching assistant or graduate research assistant positions or through one of many fellowships. More than half the students in the program have fellowships from a source like the National Science Foundation, IGERT, the Graduate School, or the Cockrell School of Engineering.

## Facilities for Graduate Work

The Department of Biomedical Engineering has offices and laboratories in the Biomedical Engineering Building, completed in 2008. Research is also conducted at the partner institutions in Houston, at the University of Texas Medical Branch at Galveston, and at the University of Texas Health Science Center at San Antonio. Students have access to facilities for research in biochemical and protein engineering, cell and tissue engineering, gene therapy, cell-electronic interfaces and nanostructure engineering, cell biomechanics, whole-body biomechanics and gait analysis, thermal engineering, optical spectroscopy and imaging, ultrasound imaging, laser-tissue interactions, image processing, biosignal analysis and computer graphics, protein bioinformatics, functional genomics, protein modeling, and computational disease diagnosis.

In addition to individual research laboratories, a number of core facilities are available for research at the medical school campuses. The following are located on the University of Texas at Austin campus:

**Institute for Cellular and Molecular Biology core facilities.** The Institute for Cellular and Molecular Biology (ICMB) was created by the College of Natural Sciences to foster the growth of modern cell and molecular biology research at the University. The ICMB provides four core user facilities. The *DNA and Genomics Facility* provides automated sequencing and fragment analysis. Two ABI Prism 377 DNA sequencers and an ABI 3700 DNA analyzer are used. The ABI 3700 is a capillary-based sequencer that allows up to six hundred samples to be run daily; the facility currently analyzes more than two thousand samples monthly, with a success rate of about 95 percent. An average run generates readable data between five hundred and seven hundred bases, and turnaround time is one or two days.

The *Protein Microanalysis Facility* provides de-novo N-terminal protein/peptide sequencing, internal sequencing/peptide mapping, amino acid composition analysis, peptide synthesis, and mass spectrometry (ESI-MS, LC-MS, and MALDI-TOF-MS). Liquid chromatography, high-pressure liquid chromatography (HPLC), and capillary electrophoresis are available for preparative and analytical runs. Two protein sequencers, an amino acid analyzer, a peptide synthesizer, a capillary electrophoresis system, an analytical HPLC system, an electrospray mass spectrometer, and a

MALDI-TOF mass spectrometer are operated in the facility. The running of gels and electroblotting for sequencing also can be arranged.

The *Microscopy and Imaging Facility* contains a 100kv transmission electron microscope (TEM), a high-resolution 100kv TEM, a scanning electron microscope (SEM), a flow cytometer, and a laser scanning confocal microscope. The laser scanning fluorescence confocal microscope features a krypton/argon mixed gas laser, an ultraviolet laser, and DIC optics in an inverted microscope. Three channels can be monitored simultaneously at high resolution. The lasers supply excitation at 354/361 nm, 488 nm, 568 nm, and 647 nm.

The *IGERT Microscopy/Spectroscopy User Facility* contains four major pieces of equipment. A user-facility manager is available to provide training and assistance.

1. A deconvolution microscope workstation with full-featured image processing software, coupled with a high-resolution, low-light camera, can computationally reassign (deconvolve) the out-of-focus components of a through-focus series of a specimen using either user-defined theoretical or measured-point spread functions. The image processing software has features for both the quantitation of image sets and extensive three-dimensional reconstruction and volume rendering.
2. A Fourier transform infrared (FTIR) spectrophotometer with added auxiliary experimental module can be used in grazing angle and transmission modes for the characterizations of thin films and monolayers.
3. An ultraviolet/visible diode array spectrophotometer with Peltier temperature-controlled cuvette holder collects simultaneous wavelengths in either absorbance or transmittance modes. This ability is required to characterize samples with rapid reaction times and to follow enzyme kinetics.
4. A cuvette-based scanning spectrofluorometer with a laser fluorescence lifetime module is used to study a wide variety of liquid and solid samples in both steady-state and time-resolved fluorescence modes. The intensity-based, time-domain system accurately measures fluorescence decays over multiple time scales; coupled with the dye laser/frequency doubler, it allows accurate measurements of solid samples with low quantum yields or turbid liquid samples with high scattering properties.

**Texas Materials Institute and Center for Nano and Molecular Science and Technology core facilities.** The Texas Materials Institute (TMI) maintains core facilities in electron microscopy, surface analysis, polymer characterization, and X-ray scattering. The Center for Nano and Molecular Science and Technology (CNM) is a multidisciplinary, collaborative research center focused on several emerging areas of research. A multidepartmental effort of the College of Natural Sciences and the Cockrell School of Engineering, CNM houses extensive shared user facilities, including a picosecond fluorescence lifetime spectrometer/microscope; an FTIR spectrometer; a near-field scanning optical microscope; organic thin film fabrication equipment; beam lithography systems; a molecular force probe microscope; a transmission electron microscope; and a time-correlated single photon counting facility.

**Animal Resources Center facilities.** The Animal Resources Center (ARC) is a fourteen-thousand-square-foot state-of-the-art facility in which animal surgical procedures are performed. A separate building houses transgenic and knock-out animals. The facility is fully staffed and equipped in compliance with NIH and AAALAC guidelines for accreditation. Available are animal operating rooms, support staff, equipment for preparing tissue specimens, and veterinary consultation for both animal husbandry and surgery.

**Computer and computational facilities.** All research groups maintain computers for use by their graduate students, and each academic unit has one or more core computer facilities. The University also has core computer user facilities across campus. In addition, advanced computational facilities are maintained by the Institute for Computational Engineering and Sciences (ICES). Extensive computing facilities are available to faculty members and students, including a scientific visualization lab, a medium-sized massively parallel processing computer, a network of eighteen RS6000s networked by optic fiber, and many X-terminals. Also available are a forty-five-node Intel Paragon and a thirty-two-node Cray J90.

**Library facilities.** The University has outstanding library facilities, including a general collection of 2.5 million volumes in the Perry-Castañeda Library and topical collections in specialized libraries like the Mallet Chemistry Library, the McKinney Engineering Library, and the Life Sciences Library.

## Areas of Study

The biomedical engineering program is interdisciplinary, with a faculty that includes members of the School of Biological Sciences, the Departments of Kinesiology and Health Education, Chemistry and Biochemistry, Psychology, Biomedical Engineering, and several other departments in the Cockrell School of Engineering. In addition, several faculty members from the University of Texas Medical Branch at Galveston, the University of Texas Health Science Center at San Antonio, the University of Texas Health Science Center at Houston, and the University of Texas M. D. Anderson Cancer Center serve on the Graduate Studies Committee and supervise biomedical engineering students.

The current research of this faculty is focused in the following areas: biomedical imaging and instrumentation, cellular and biomolecular engineering, computational biomedical engineering, and instrumentation. Research activities embrace such topics as bioinstrumentation, modeling and control of biological systems, nerve fiber regeneration, biomedical computer and information technology, biomechanics, cell and tissue mechanics, thermal processes, musculoskeletal modeling, acquisition and analysis of in vivo and ex vivo spatial human biomechanics data, acquisition of physiological data by noninvasive means, cell and tissue engineering, design and testing of novel fluid and drug delivery systems, effects of laser radiation on biological material, laser applications in medicine, coherence imaging of biological materials, pulsed photothermal tomography, biorheology, visual system instrumentation, computer vision, production and purification of genetically engineered proteins, DNA and drug delivery, cell-electronic interfaces, acquisition and processing of neurological signals, neuroprostheses, applications of finite element modeling in medicine, acoustics and ultrasound, image processing, thermography, hyperthermia, genomic signal processing, biological and medical informatics, and nanotechnology.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Lawrence D Abraham  
Catherine G Ambrose  
Chandrajit L Bajaj  
Aaron Blair Baker  
James A Bankson  
Ronald E Barr  
Marcelo Sergio Behar  
Adela Ben-Yakar  
Alan C Bovik  
Amy Brock  
John H Byrne  
Ray T Chen  
Kevin N Dalby  
Kenneth R Diller  
Jonathan B Dingwell  
Andrew K Dunn  
Andrew Ellington  
Stanislav Emelianov  
Wilson S Geisler III  
George Georgiou  
Debadyuti Ghosh  
Joydeep Ghosh  
Lisa Griffin  
Robin Gutell  
Mark F Hamilton  
Ning Jiang  
Daniel Johnston  
Nanshu Lu

Edward M Marcotte  
Mia K Markey  
Thomas E Milner  
Tessie J Moon  
John A Pearce  
Nicholas A Peppas  
Martin Poenie  
Gregory P Reece  
Pengyu Ren  
Krishnendu Roy  
Christopher G Rylander  
Henry G Rylander III  
Marissa Nichole Rylander  
Michael S Sacks  
Jason B Shear  
Li Shi  
Michael H Smolensky  
Hugh D Smyth  
D M Snodderly  
Konstantin V Sokolov  
Jeanne Casstevens Stachowiak  
Laura J Suggs  
James W Tunnell  
Jonathan W Valvano  
Chong Xie  
Bugao Xu  
Hsin-Chih Yeh  
Janeta Zoldan

## Admission Requirements

The graduate adviser and the Admissions Committee make all admission decisions. Standards for entrance into the program exceed the minimum standards established by the University. Students must have a bachelor's degree with the following coursework or equivalent knowledge: freshman biology, freshman inorganic chemistry, differential equations, probability and statistics, and calculus-based physics. An applicant with a degree in an area other than engineering must take specified preliminary coursework before applying to the graduate program in biomedical engineering. The coursework does not need to be completed at UT Austin. Information about the admission process is given online (<http://www.bme.utexas.edu>).

Admission decisions are based on a careful review of all aspects of each applicant's file, including score on the Test of English as a Foreign Language, if needed, grade point average, Graduate Record Examinations scores, letters of recommendation, personal statement, and previous research or work experience. Only the most qualified applicants are accepted. Admission is not based on test scores and grade point averages alone; other important factors include the applicant's statement of purpose, reference letters, résumé, and transcripts. The number of students admitted each semester depends on the availability of supervising faculty members to provide research facilities and possible financial support. Most students are admitted for doctoral study, but students interested in the MSE are also considered on a case-by-case basis.

All applicants whose native language is not English must submit a score on the Test of English as a Foreign Language (TOEFL).

## Degree Requirements

The Master of Science in Engineering and the Doctor of Philosophy degree programs include a core curriculum and courses from one or more areas of specialization selected with the approval of the graduate adviser. Specializations are offered in cellular and molecular imaging, cellular and

biomolecular engineering, computational biomedical engineering and bioinformatics, and cellular biomechanics. The graduate adviser and the Executive Committee of the Graduate Studies Committee must approve deviation from the prescribed curriculum.

## Master of Science in Engineering

The master's degree requires at least thirty semester hours of coursework, including six hours in the thesis course and eighteen hours of biomedical engineering coursework. The remaining six semester hours should be selected from courses outside the field of biomedical engineering. These additional courses must be logically related to the student's program and must be approved by the graduate adviser.

A thesis is normally expected; however, with the consent of the graduate adviser, the student may follow a degree plan that includes a report or one with neither thesis nor report. The report option requires thirty semester hours of coursework, consisting of six courses in the major, three courses in supporting work, and three hours in the report course. The plan without thesis or report requires thirty semester hours of coursework, consisting of at least six courses in the major and up to four courses in supporting work.

## Doctor of Philosophy

Doctoral degree students complete at least twenty-six semester hours of coursework beyond the baccalaureate degree, in addition to conducting research necessary to write a dissertation under the direction of a faculty supervisor. The twenty-six hours of coursework must be composed of one course from each of the three specializations mentioned above, two seminar courses, one biological/clinical course, a mathematics course, and three other supporting graduate-level courses.

After the first year of study, the student must pass both written and oral components of the qualifying examination. The student must present a written and oral dissertation proposal to the dissertation committee within two years of enrollment in the program. The written proposal must be formatted according to the guidelines of the National Science Foundation or the National Institutes of Health. Before taking the oral examination, the student is expected to formulate a hypothesis and propose an approach to a selected research problem with a selected supervisor. The student is examined specifically on the proposed research. After the oral examination, the dissertation committee determines if the student should complete additional coursework. At least one faculty member outside the biomedical engineering Graduate Studies Committee must participate in examining and supervising the student.

## Dual Degree Program

### Doctor of Philosophy/Doctor of Medicine

The graduate program in biomedical engineering participates in a dual degree program with the University of Texas Medical Branch at Galveston (UTMB). Admission to the UTMB MD/PhD program is restricted to United States citizens and permanent residents. Applicants must apply separately and be admitted to both the PhD program in biomedical engineering at the University of Texas at Austin and the medical school at UTMB; this program is not accepting new applications. Students accepted into the dual degree program spend their first two years of study in medical school, followed by three to four years of doctoral work at UT Austin. Students then return to medical school to complete the MD degree. The degrees are conferred separately by each institution. Additional information may be found online (<http://www.bme.utexas.edu>).

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Biomedical Engineering: BME

#### BME 180J, 380J. Fundamentals of Biomedical Engineering.

One or three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

##### Topic 1: Mathematical Modeling in Biomedical Engineering.

Conservation of mass, momentum, energy, and charge; first and second laws of thermodynamics; first- and second-order differential equations; nonlinear differential equations; partial differential equations as applied to biomedical engineering problems.

##### Topic 2: Quantitative Systems Physiology and Pathophysiology.

Modeling of physiological systems from the molecular and cellular levels to the systems level; focus on the neuromuscular and cardiovascular systems. Prerequisite: An undergraduate physiology course or the equivalent, and consent of instructor.

**Topic 3: Principles of Biomeasurement.** Principles of signal measurement in the biomedical field; survey of transducers used for chemical, mechanical, electrical, and thermal biomedical measurements; analysis of how signals are converted into digital form; analysis of noise; aliasing; data storage.

**Topic 4: Fields, Forces, and Flows.** Introduction to mathematical models that integrate different energy domains and length scales, with an emphasis on the coupling between them. Prerequisite: Biomedical Engineering 380J (Topic 1) and 380J (Topic 2).

**Topic 5: Biostatistics, Study Design, and Research Methodology.** Principles for hypothesis testing; confidence limits; regression analysis; correlation; analysis of variance; experimental design and factorial analysis; discriminate analysis; applications of statistics. Prerequisite: An undergraduate probability theory course or the equivalent, and consent of instructor.

##### Topic 6: Analysis of Biomedical Engineering Systems I.

Quantitative examination of the cardiovascular and respiratory systems from the cell to system levels. Presents the cardiovascular and respiratory systems in three phases: (1) anatomy and physiology; (2) energetics (thermodynamics), cellular processes, and engineering analysis; and (3) engineered devices, instrumentation, and imaging for therapeutics and diagnosis. Additional prerequisite: A course in physiology, proficiency in MATLAB, and consent of the graduate adviser.

##### Topic 7: Analysis of Biomedical Engineering Systems II.

Computational techniques used in biomedical engineering. Students propose and conduct an engineering design study relevant to a selected medical problem. Additional prerequisite: Biomedical Engineering 380J (Topic 6).

#### BME 080M. Dual MD/PhD Program with UT Medical Branch.

Preclinical medical study at the University of Texas Medical Branch at Galveston. May not be taken concurrently with another course at the University of Texas at Austin. Prerequisite: Graduate standing and admission to the MD/PhD dual degree program in biomedical engineering.

## **BME 381J. Topics in Cell and Molecular Imaging.**

Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in engineering and consent of instructor; additional prerequisites vary with the topic.

**Topic 1: Laser-Tissue Interaction: Thermal.** Same as Electrical Engineering 385J (Topic 9: Laser-Tissue Interaction: Thermal). The thermal response of random media in interaction with laser irradiation. Calculation of the rate of heat production caused by direct absorption of the laser light, thermal damage, and ablation.

**Topic 2: Laser-Tissue Interaction: Optical.** Same as Electrical Engineering 385J (Topic 16: Laser-Tissue Interaction: Optical). The optical behavior of random media such as tissue in interaction with laser irradiation. Approximate transport equation methods to predict the absorption and scattering parameters of laser light inside tissue. Port-wine stain treatment; cancer treatment by photochemotherapy; and cardiovascular applications.

**Topic 3: Biomedical Imaging: Signals and Systems.** Same as Electrical Engineering 385J (Topic 18: Biomedical Imaging: Signals and Systems). Physical principles and signal processing techniques used in thermographic, ultrasonic, and radiographic imaging, including image reconstruction from projections such as CT scanning, MRI, and millimeter wave determination of temperature profiles. Additional prerequisite: Electrical Engineering 371R.

**Topic 4: Optical Spectroscopy.** Same as Electrical Engineering 385J (Topic 23: Optical Spectroscopy). Measurement and interpretation of spectra: steady-state and time-resolved absorption, fluorescence, phosphorescence, and Raman spectroscopy in the ultraviolet, visible, and infrared portions of the spectrum.

**Topic 5: Therapeutic Heating.** Same as Electrical Engineering 385J (Topic 26: Therapeutic Heating). Engineering aspects of electromagnetic fields that have therapeutic applications: diathermy (short wave, microwave, and ultrasound), electrosurgery (thermal damage processes), stimulation of excitable tissue, and electrical safety.

**Topic 6: Noninvasive Optical Tomography.** Same as Electrical Engineering 385J (Topic 28: Noninvasive Optical Tomography). Basic principles of optical tomographic imaging of biological materials for diagnostic or therapeutic applications. Optical-based tomographic imaging techniques including photothermal, photoacoustic, and coherent methodologies.

**Topic 7: Digital Image and Video Processing.** Digital image acquisition, processing, and analysis; algebraic and geometric image transformations; two-dimensional Fourier analysis; image filtering and coding. Additional prerequisite: Credit or registration for Biomedical Engineering 335 or Electrical Engineering 351K.

**Topic 8: Functional Imaging Laboratory.** Three lecture hours a week for one semester. Additional hours to be arranged. Biomedical Engineering 381J (Topic: Functional Imaging Laboratory) and 381J (Topic 8) may not both be counted. Additional prerequisite: Graduate standing in engineering.

**Topic 9: Fundamentals of Biomedical Optical Imaging.** Biomedical Engineering 381J (Topic: Fundamentals of Biomedical Optical Imaging) and 381J (Topic 9) may not both be counted.

**Topic 10: Optics and Lasers.** Fundamentals of geometric and physical optics, interaction of light with matter, spectroscopy, and laser and electro-optics applications. Biomedical Engineering 381J (Topic: Optics and Lasers) and 381J (Topic 10) may not both be counted.

**Topic 11: Medical Imaging.** Biomedical Engineering 381J (Topic: Medical Imaging) and 381J (Topic 11) may not both be counted.

**Topic 12: Optical Design.** The principles of optical design for imaging and laser delivery systems are given. Students develop and test designs using a commercial optical design software package.

Biomedical Engineering 381J (Topic: Optical Design) and 381J (Topic 12) may not both be counted.

**Topic 13: Fluorescence Micro- and Spectroscopy.** Biomedical Engineering 381J (Topic: Fluorescence Micro-/Spectroscopy) and 381J (Topic 13) may not both be counted. Additional prerequisite: Consent of graduate adviser.

## **BME 382J. Topics in Cellular and Biomolecular Engineering.**

Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in engineering and consent of instructor.

**Topic 1: Cell and Tissue Engineering.** Use of case studies to explore pathologies of tissue, current clinical treatment, and the role of engineers in developing new technologies to diagnose and treat these pathologies. Emphasis on the use of quantitative cellular and molecular techniques. Applications of synthetic and natural biomaterials.

Additional prerequisite: Quantitative physiology or pathophysiology course.

**Topic 2: Introduction to Biochemical Engineering.** Microorganisms in chemical and biochemical synthesis; genetic manipulation of cells by classical and recombinant DNA techniques; enzyme technology; design of bioreactors and microbial fermentations; and separations of biological products.

**Topic 3: Molecular Sensors and Nanodevices for Biomedical Engineering Applications.** Introduction to a variety of methods used to detect biological molecules with optical and electrical transduction mechanisms. Covers the classical approaches to biosensors for the detection of specific molecules in biological systems.

**Topic 4: Advanced Engineering Biomaterials.** Overview of biomaterials, including prosthetics, ceramics, metal implants, and polymers, with specific emphasis on properties and applications. The immunology of material-tissue interactions and the issues of biocompatibility.

**Topic 5: Structured Surfaces, Fabrication, Characterization, and Application.** Introduction to fabrication and characterization techniques used to create and analyze microstructured and nanostructured surfaces for biomedical and biotechnology applications. Focuses on the use of self-assembly processes for the fabrication of biological functionality in surface structures.

**Topic 6: Biopolymers and Drug/Gene Delivery.** Biomedical polymers and their applications in drug delivery and gene therapy. Emphasis on parenteral, mucosal, and topical delivery of biomolecules, and the role of polymers in genetic therapy and DNA vaccination.

**Topic 7: Cellular and Molecular Biomechanics.** Introduction to the concepts needed to understand and work in the emerging field of cellular and molecular biomechanics. Examination of dynamic interplay between chemical, thermal, and physical forces in determining the mechanics of cells/tissues and their molecular components. Three lecture hours a week for one semester, with additional hours to be arranged. Biomedical Engineering 382J (Topic: Cellular and Molecular Biomechanics) and 382J (Topic 7) may not both be counted. Additional prerequisite: Graduate standing; and coursework in calculus, physics, solid mechanics, and basic chemical/biological principles.

**Topic 8: Molecular Biophysics: Measurements and Methods.** In-depth study and development of intuition for thermodynamics and mechanics and application of understanding to molecular-scale problems in cell biology and biomedical engineering. Focus on increasing students' familiarity with modern methods of biophysical measurement, their strengths and limitations, and how they are being applied to address current research problems. Biomedical Engineering 382J (Topic: Molecular Biophysics: Measurements and Methods) and 382J (Topic 8) may not both be counted. Additional prerequisite: Undergraduate biology, calculus, chemistry, and physics is recommended.

## **BME 383J. Topics in Computational Biomedical Engineering and Bioinformatics.**

Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in engineering and consent of instructor; additional prerequisites may vary with the topic.

**Topic 1: Network Thermodynamics in Biophysics.** Modeling and simulation methods for nonlinear biological processes, including coupling across multienergy domains; practical implementation by bond graph techniques. Additional prerequisite: Mechanical Engineering 344 or consent of instructor.

**Topic 2: Musculoskeletal Biomechanics.** Synthesis of properties of the musculotendon and skeletal systems to construct detailed computer models that quantify human performance and muscular coordination. Additional prerequisite: Mathematics 341 and Kinesiology 395 (Topic 36: Biomechanics of Human Movement).

**Topic 4: Biomechanics of Human Movement.** Same as Kinesiology 395 (Topic 36: Biomechanics of Human Movement). Additional prerequisite: Kinesiology 326K, two semesters of calculus, one semester of college physics (mechanics), and consent of instructor.

**Topic 5: Introduction to Nonlinear Dynamics in Biological Systems.** Same as Kinesiology 395 (Topic 63: Introduction to Nonlinear Dynamics in Biological Systems). Basic concepts of nonlinear mathematics and their application to biological systems. Additional prerequisite: Two semesters of college-level calculus and consent of instructor.

**Topic 7: Data Mining.** Analyzing large data sets for interesting and useful information; online analytical processing, finding association rules, clustering, classification, and function approximation; scalability of algorithms and real-life applications.

**Topic 8: Systems Biology.** The biological function of genetic and biochemical networks from a quantitative perspective. Students use mathematical tools to model network modules, such as biological switches, oscillators, and amplifiers. Discusses recent papers on a variety of biological problems that can be addressed with a systems biology approach. Additional prerequisite: Biology 311C and Mathematics 427K; Chemistry 369 or an introductory course in biochemistry, and knowledge of MATLAB, are recommended.

**Topic 9: Computational Methods for Biomedical Engineers.** Study of and hands-on experiences with computational methods commonly employed in biomedical engineering research. Three lecture hours a week for one semester. Biomedical Engineering 383J (Topic: Computational Methods for Biomedical Engineers I) and 383J (Topic 9) may not both be counted. Additional prerequisite: Graduate standing in engineering.

**Topic 10: Computational Biomolecular Engineering.** Provides an introduction to the principles and applications of biomolecular modeling and simulation, including the theoretical background of molecular thermodynamics and molecular mechanics, major simulation/computational techniques and commonly used software tools. Biomedical Engineering 383J (Topic: Computational Biomolecular Engineering) and 383J (Topic 10) may not both be counted. Additional prerequisite: Undergraduate biochemistry coursework, and thermodynamics or physical chemistry coursework; or consent of instructor.

## **BME 384J. Topics in Instrumentation.**

Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in engineering and consent of instructor; additional prerequisites vary with the topic.

**Topic 1: Biomedical Instrumentation I.** Same as Electrical Engineering 385J (Topic 31: Biomedical Instrumentation I). Application

of electrical engineering techniques to analysis and instrumentation in biological sciences: pressure, flow, temperature measurement; bioelectrical signals; pacemakers; ultrasonics; electrical safety; electrotherapeutics.

**Topic 2: Biomedical Instrumentation II: Real-Time Computer-Based Systems.** Same as Electrical Engineering 385J (Topic 17: Biomedical Instrumentation II: Real-Time Computer-Based Systems). Design, testing, patient safety, electrical noise, biomedical measurement transducers, therapeutics, instrumentation electronics, microcomputer interfaces, and embedded systems. Four structured laboratories and an individual project laboratory.

**Topic 3: Biosignal Analysis.** Same as Electrical Engineering 385J (Topic 15: Biosignal Analysis). Theory and classification of biological signals such as EEG, EKG, and EMG. Data acquisition and analysis procedures for biological signals, including computer applications.

**Topic 4: Bioelectric Phenomena.** Same as Electrical Engineering 385J (Topic 3: Bioelectric Phenomena). Examines the physiological bases of bioelectricity and the techniques required to record bioelectric phenomena both intracellularly and extracellularly; the representation of bioelectric activity by equivalent dipoles and the volume conductor fields produced.

**Topic 5: Projects in Biomedical Engineering.** Same as Electrical Engineering 385J (Topic 32: Projects in Biomedical Engineering). An in-depth examination of selected topics, such as optical and thermal properties of laser interaction with tissue; measurement of perfusion in the microvascular system; diagnostic imaging; interaction of living systems with electromagnetic fields; robotic surgical tools; ophthalmic instrumentation; noninvasive cardiovascular measurements. Three lecture hours and six laboratory hours a week for one semester. Additional prerequisite: Biomedical Engineering 384J (Topic 1) or Electrical Engineering 385J (Topic 31).

**Topic 6: Neurophysiology/Prosthesis Design.** Same as Electrical Engineering 385J (Topic 33: Neurophysiology/Prosthesis Design). The structure and function of the human brain. Discussion of selected neurological diseases in conjunction with normal neurophysiology. Study of neuroprosthesis treatments and design philosophy, functional neural stimulation, and functional muscular stimulation.

## **BME 385J. Topics in Biomedical Engineering.**

Three lecture hours a week for one semester, or as required by the topic. Biomedical Engineering 385J and 387J may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in engineering and consent of instructor.

**Topic 6: Analysis of Biological Systems.** Biomedical Engineering 383J (Topic: Analysis of Biological Systems I) and 385J (Topic 6) may not both be counted.

**Topic 12: Biomedical Heat Transfer.** Biomedical Engineering X85J (Topic 12) is same as Chemical Engineering 385J (Topic 12: Biomedical Heat Transfer), Electrical Engineering 385J (Topic 12: Biomedical Heat Transfer), and Mechanical Engineering 385J (Topic 12: Biomedical Heat Transfer). Application of the principles of heat transfer to the solution of a series of advanced, open-ended problems in medicine and biology. Inquiry learning format in which students take personal responsibility for identifying and pursuing solution strategies for a range of cutting edge problems in bioheat transfer. Additional prerequisite: One or more courses in transport phenomena.

**Topic 39: Medical Decision Making.** Selected subjects from cognitive psychology and human-machine interaction for engineering students to design more effective systems for supporting medical decision making. Biomedical Engineering 385J (Topic: Medical Decision Making) and 385J (Topic 39) may not both be counted.

### **BME 396. Research Internship.**

Students participate in research in an industry, clinic, or academic laboratory setting selected with the approval of the faculty adviser. At least twenty hours of fieldwork a week for one semester. May be counted only once toward either the master's or the doctoral degree. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **BME 197, 297, 397, 597, 697. Research Problems.**

Problems selected by the student with approval of the faculty adviser. For each semester hour of credit earned, three laboratory hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in biomedical engineering.

### **BME 197E. Professional Responsibilities in Imaging.**

One lecture hour a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **BME 197N. Integrated Biomedical Engineering Seminar.**

Designed to support students' professional development as well as their broad understanding of the biomedical engineering research enterprise. One lecture hour a week for one semester. Prerequisite: Graduate standing.

### **BME 197R, 297R, 397R. Imaging Research Seminar.**

For each semester hour of credit earned, one lecture hour a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **BME 197S. Graduate Seminar in Biomedical Engineering.**

The equivalent of one lecture hour a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **BME 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in biomedical engineering and consent of the graduate adviser; for 698B, Biomedical Engineering 698A.

### **BME 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in biomedical engineering and consent of the graduate adviser.

### **BME 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **BME 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Biomedical Engineering 399R, 699R, or 999R.

## **Chemical Engineering**

*Master of Science in Engineering  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Chemical and Petroleum Engineering Building (CPE) 5.404, phone (512) 471-6991, fax (512) 475-7824; campus mail code: C0400

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Chemical Engineering, Stop C0400, Austin TX 78712

**E-mail:** chemegrad@che.utexas.edu

**URL:** <http://www.che.utexas.edu/>

## **Objectives**

The graduate program in chemical engineering is designed to provide students with the opportunity to develop advanced competence in transport phenomena, thermodynamics, and reaction engineering for the application of chemistry to the advancement of society. Through formal coursework and mentoring, each student is expected to acquire the tools to develop and transmit new knowledge and processes in a focused area of chemical engineering. The focused research areas include advanced materials, polymers and nanotechnology, biotechnology, energy, environmental engineering, modeling and simulation, and process engineering.

## **Program Educational Objectives**

Upon graduation, those who earn advanced chemical engineering degrees are expected

1. To apply knowledge of mathematics, chemistry, physics, computing, safety, and engineering to solve problems of analysis, design, optimization, and control of components, systems, and processes important in chemical engineering practice.
2. To demonstrate the skills required to lead and/or participate effectively on interdisciplinary teams.
3. To recognize the importance of lifelong education in meeting professional and personal goals.
4. To demonstrate proficiency in writing and oral presentation skills, and recognition of the importance of effective communication and its many different forms.
5. To articulate and practice professional, ethical, and societal responsibilities.

## **Facilities for Graduate Work**

The Department of Chemical Engineering contains laboratories, offices, and all facilities necessary for research and instruction. Some research in the separations area is conducted at the J. J. Pickle Research Campus. Excellent library facilities include the Mallet Chemistry Library, the McKinney Engineering Library, and the Kuehne Physics Mathematics Astronomy Library.

The extensive computer facilities available for graduate student research include more than one hundred microcomputers and workstations in the Chemical and Petroleum Engineering Building as well as super computing facilities in the Texas Advanced Computing Center. Computer graphics capabilities are available. State-of-the-art analytical instrumentation, located within the department and in other departments, is available for use by chemical engineering graduate students.

The department enjoys close relations with the chemical, petroleum, and materials processing industries. A number of cooperative research projects are carried out with the support of private companies. A substantial portion of the graduate student research is supported through federal grants and contracts.

## **Areas of Study**

**Biochemical and biomedical engineering.** Protein engineering, fermentations, genetic engineering technology, mammalian tissue culture,



biomaterials, biosensors, cell and tissue engineering, virus removal from blood, hemodialysis.

**Chemical engineering fundamentals.** Kinetics and catalysts, thermodynamics, transport phenomena.

**Energy resources.** Secondary and tertiary oil recovery, flow processes in porous media, acid gas treating.

**Environmental engineering.** Air pollution modeling and control, atmospheric chemistry.

**Materials and processes for microelectronics.** Plasma processing, etching, chemical vapor deposition, selective laser sintering, supermolecular self-assembly and organization, colloidal systems, mesoscopic materials.

**Meso- and molecular-scale modeling and simulation.** Statistical and micromechanical modeling and Monte Carlo, Brownian, and molecular dynamics simulations of reactions, complex fluids, polymers, and biological molecules.

**Polymer engineering.** Synthesis; processing; reaction injection molding; properties, with specific emphasis on blends, transport, and thermodynamic behavior; membranes; microelectronics; thin film; composition.

**Process engineering.** Chemical reaction engineering and catalyst development; optimization; process simulation, dynamics, and control; fault detection, rheology and simulation of suspensions.

**Separations.** Membrane separations, distillation, absorption, supercritical extraction.

**Other areas.** Aerosol physics and chemistry, surface phenomena, crystal chemistry and physical properties, electrochemistry, electronic and optical materials, electrical impedance tomography.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

David T Allen	Keith P Johnston
Hal S Alper	Brian A Korgel
Michael Baldea	Arumugam Manthiram
Roger T Bonnecaze	Jennifer A Maynard
James R Chelikowsky	Delia Milliron
Lydia Maria Contreras	Charles B Mullins
Thomas F Edgar	Donald R Paul
John G Ekerdt	Nicholas A Peppas
Christopher J Ellison	Danny D Reible
Benny D Freeman	Gary T Rochelle
Venkat Ganesan	Peter J Rosicky
George Georgiou	Isaac C Sanchez
Adam Heller	Mukul M Sharma
Lea Hildebrandt Ruiz	Thomas M Truskett
Gyeong S Hwang	Carlton G Willson

## Admission Requirements

Students with a Bachelor of Science in Chemical Engineering degree from a school accredited by the AIChE-ECPD usually fulfill the requirements for consideration for admission. Other students, including those with a bachelor's degree in chemistry, physics, engineering, engineering science, or geology (geochemistry), must have a background that the Graduate Studies Committee considers satisfactory for the study of advanced chemical engineering. Some nonelective undergraduate

chemical engineering courses may be required as part of the course program in this case.

## Degree Requirements

### Master of Science in Engineering

The student's program of coursework is selected with the advice of the graduate adviser and must be approved by the Graduate Studies Committee.

**Master of Science in Engineering with thesis.** For students electing this option, thirty semester hours of coursework, including six hours in the thesis course, are required. At least twelve hours of graduate coursework (the major) must be in chemical engineering, and at least six hours (the minor) must be outside chemical engineering. Only graduate courses in chemical engineering count toward the degree, but up to six hours of upper-division coursework outside chemical engineering may be included in the minor. A grade point average of at least 3.00 must be attained on graduate coursework in the major.

A thesis problem is selected after the student has consulted members of the Graduate Studies Committee. The thesis research problem should be selected during the first semester and initial research begun at that time. At least one full year is required to complete the master's degree program.

**Master of Science in Engineering with report.** This option requires thirty hours of coursework, including three hours in the report course. At least fifteen hours must be completed in graduate-level chemical engineering courses and at least six hours must be outside chemical engineering. Up to six hours of upper-division coursework may be counted. A grade point average of at least 3.00 must be attained on graduate coursework in the major.

**Master of Science in Engineering without thesis or report.** For students electing this option, thirty semester hours of coursework are required. At least eighteen semester hours must be completed in graduate coursework in chemical engineering, and at least six hours must be outside chemical engineering. Up to six hours of upper-division coursework may be included. No research is required, but a grade point average of at least 3.00 must be attained on graduate coursework in the major. Enrollment in this option must be approved by the chairman of the Graduate Studies Committee in chemical engineering.

### Doctor of Philosophy

A student may choose to pursue the doctoral degree without first obtaining a master's degree. Before admission to candidacy, the student must pass a written qualifying examination that covers material normally presented in an accredited undergraduate chemical engineering curriculum. The doctoral candidate must also pass preliminary and final oral examinations covering the research program.

For a student with a Bachelor of Science degree, at least three years are required to complete the Doctor of Philosophy degree program.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## Chemical Engineering: CHE

### CHE 180C. Laboratory Safety.

Safe laboratory practice. Training in use of fire extinguishers and first aid. Case studies of laboratory accidents. One lecture hour a week for one semester. Prerequisite: Graduate standing in chemical engineering.

### CHE 381N. Fluid Flow and Heat Transfer.

Advanced treatment of fluid flow and heat transfer problems in chemical engineering. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### CHE 381P. Advanced Analysis for Chemical Engineers.

Applications of mathematical methods to chemical engineering problems, with emphasis on differential equations, linear analysis and matrices, and real analysis and complex variables. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### CHE 381Q. Quantitative Analysis of Cellular and Molecular Biology.

Analyzes biological systems from stoichiometric, thermodynamic, and kinetic perspectives. Case studies illustrate how these principles are used to understand disease, control cellular behavior, and design protein-based therapeutics. Three lecture hours a week for one semester. Chemical Engineering 381Q and 384 (Topic: Quantitative Analysis of Cellular and Molecular Biology) may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### CHE 384E. Electrochemistry and Electrochemical Engineering.

Fundamental principles of electrochemistry combined with mass transfer including applications in analytical chemistry as well as industrial electrochemistry. Three lecture hours a week for one semester. Chemical Engineering 384 (Topic: Electrochemistry/Chemical Engineering) and 384E may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### CHE 384K. Chemical Kinetics and Surface Chemistry.

Application of chemical reaction kinetics to the prediction and determination of reaction rates and reaction selectivity. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Chemical Engineering 387K or consent of instructor.

### CHE 384S. Current and Emerging Trends in Chemical Engineering Research.

Overview of current and emerging trends in chemical engineering research with frequent guest presentations by leading scholarly and industrial researchers in the discipline. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### CHE 384T. Topics in Chemical Engineering.

Three lecture hours a week for one semester. Chemical Engineering 384 and 384T may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### CHE 185, 285, 385, 685. Research.

For each semester hour of credit earned, the equivalent of one class hour a week for one semester. May be repeated for credit. Prerequisite: Graduate standing in chemical engineering, or graduate standing and consent of instructor.

### CHE 385M. Surface Phenomena.

Liquid/fluid interfaces including equilibrium and nonequilibrium phenomena. Topics covered include capillarity, thermodynamics, surface rheology, and streaming potentials. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### CHE 385P. Optimization: Theory and Practice.

Techniques of optimization, including formulation of optimization problems, one-dimensional search techniques, analytical methods, and n-dimensional search techniques; application of methods to process-industry problems. Three lecture hours a week for one semester. Chemical Engineering 384 (Topic: Optimization: Theory and Practice) and 385P may not both be counted. Prerequisite: Graduate standing.

### CHE 386K. Theory of X-Ray Diffraction.

Application of basic diffraction theory to polycrystalline and single crystal materials. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### CHE 386L. Laboratory Experiments in X-Ray Diffraction.

Application of X-ray diffraction techniques to the examination of polycrystalline and single crystal materials. Two or three lecture hours and three or four laboratory hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### CHE 387K. Advanced Thermodynamics.

Applications of thermodynamics to chemical engineering processes. Three lecture hours a week for one semester. Prerequisite: Graduate standing in chemical engineering, or graduate standing and consent of instructor.

### CHE 387M. Mass Transfer.

Advanced treatment of diffusional mass transfer operations in chemical engineering. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### CHE 388K. Separations Processes.

Advanced treatment of modern chemical engineering separations processes. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### CHE 391. Elements of Modern Control Theory.

Introduction to fundamentals of dynamic optimization and system theory; applications to engineering processes. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### CHE 391M. Mathematical Modeling of Engineered Systems.

Introduction to fundamentals of dynamic system modeling and associated numerical solution methods with applications to engineering systems. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

### CHE 391S. Molecular Simulation of Materials.

Introduction to basic molecular simulation techniques including molecular mechanics, molecular dynamics, and Monte Carlo method. Understanding of principles underlying these techniques, and how these techniques can be used to study the physical and chemical properties and behavior of materials at the molecular level. More advanced subjects include molecular simulations in various ensembles (NVE, NVT, NPT, grand canonical), free energy computations, controlling dynamics, and association-bias Monte Carlo method. Elementary knowledge of physical chemistry, classical mechanics, and statistical thermodynamics is assumed. Three lecture hours a week for one semester. Chemical

Engineering 384 (Topic: Simulation of Materials) and 391S may not both be counted. Prerequisite: Graduate standing.

### **CHE 392. Polymer Science.**

Details of polymerization mechanisms; structure-property relationships, fundamentals of processing, and characterization of high polymers. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **CHE 392P. Introduction to Polymer Materials Science.**

Synthesis, structural characterization, physical properties, and applications of polymers. Three lecture hours a week for one semester. Chemical Engineering 384 (Topic: Introduction to Polymer Material Science) and 392P may not both be counted. Prerequisite: Graduate standing.

### **CHE 395C. Chemical Processes for Microelectronics.**

Introduction to the chemical processes and the manufacturing operations used in microelectronics device fabrication. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **CHE 395E. Polymer Science and Engineering Laboratory.**

Training in the preparation and instrumental characterization of polymers, blends, and compounds. Twelve laboratory hours a week for one semester. Prerequisite: Graduate standing.

### **CHE 395G. Chemical Engineering Economics and Business Analysis.**

Study of the economic decisions faced by chemical engineers. Discounted cash flow techniques. Personal finance, managerial economics, and other special topics. Three lecture hours a week for one semester. Only one of the following may be counted: Chemical Engineering 342, 379 (Topic: Chemical Engineering Economics and Business Analysis), 395G. Prerequisite: Graduate standing in chemical engineering, or graduate standing and consent of instructor.

### **CHE 395J. Product and Process Development.**

Product and process innovation in the process industries; screening criteria; needs-requirements research; evaluation. Three lecture hours a week for one semester. Chemical Engineering 379 (Topic: Product and Process Development) and 395J may not both be counted. Prerequisite: Graduate standing in chemical engineering, or graduate standing and consent of instructor.

### **CHE 395K. Design for Environment.**

Overview of environmental assessment tools for chemical processes and products, including life cycle and risk assessments. Overview of design tools for improving environmental performance of chemical processes, including unit operations and flow sheet analysis methods. Three lecture hours a week for one semester. Only one of the following may be counted: Chemical Engineering 341, 384 (Topic 19: Design for Environment), 395K. Prerequisite: Graduate standing in chemical engineering, or graduate standing and consent of instructor.

### **CHE 397M. Graduate Research Internship.**

Research associated with enrollment in the Graduate Research Internship Program (GRIP). The equivalent of three lecture hours a week for one semester. Prerequisite: Graduate standing in chemical engineering and consent of instructor and the dean of the Cockrell School of Engineering.

### **CHE 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in chemical engineering and consent of the graduate adviser; for 698B, Chemical Engineering 698A.

### **CHE 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in chemical engineering and consent of the graduate adviser.

### **CHE 398T. Supervised Teaching in Chemical Engineering.**

Teaching under the close supervision of the instructor for one to four semesters; weekly group meetings; individual consultation; reports. Three lecture hours a week for one semester. Prerequisite: Graduate standing and appointment as a teaching assistant.

### **CHE 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **CHE 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Chemical Engineering 399R, 699R, or 999R.

## **Civil Engineering**

*Master of Science in Engineering  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Ernest Cockrell Jr. Hall (ECJ) 4.200, phone (512) 471-4921, fax (512) 471-0592; campus mail code: C1700

**Mailing address:** The University of Texas at Austin, Graduate Program in Civil Engineering, Department of Civil, Architectural, and Environmental Engineering, 301 East Dean Keeton C1700, Austin TX 78712

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### **Objectives**

The objectives of the graduate program in civil engineering are excellence in engineering education, research, and professional service. The program seeks to educate students to assume leadership positions in engineering practice, research, and education. The program also seeks to advance the state of the art and of the practice of civil engineering at both fundamental and applied levels through extensive research programs, and to disseminate the research outcomes through professional and scholarly activities. The program's thematic areas include architectural engineering, construction engineering and project management, construction materials, environmental and water resources engineering, geotechnical engineering, ocean engineering, structural engineering, and transportation engineering, as well as interdisciplinary areas of study.

### **Facilities for Graduate Work**

The Department of Civil, Architectural, and Environmental Engineering occupies eight floors in Ernest Cockrell Jr. Hall, which also houses the McKinney Engineering Library and computer facilities for use by civil engineering students. In addition, the facilities of Information Technology Services are available to students working on problems in any of the areas listed below. Laboratories are equipped and staffed to provide for both instruction and research.

**Building energy and environments.** The Building Energy and Environments program investigates a wide range of issues related to building environments and environmental systems. The program

research focuses on energy flows and conservation methods; building energy efficiency; environmental control systems; moisture transport and control; indoor microbial growth and fate; sources of VOCs, SVOCs, and particles; homogeneous and heterogeneous reactions; transport of indoor pollutants; and human exposure. Beside taking coursework in other areas of civil engineering and in other departments, students have a chance to specialize in building environmental systems and various aspect of indoor environmental quality. The diverse faculty, with expertise ranging from environmental, architectural, and mechanical engineering, offers a large variety of graduate courses that address different aspects of indoor air quality and energy efficiency of building environmental systems. This provides students with a unique opportunity to receive both the depth and breadth of knowledge necessary to design and maintain truly sustainable buildings. Students, faculty, and staff within the Building Energy and Environments Group conduct their research in academic laboratories equipped with cutting-edge instrumentation and simulation systems. The research activities take place in laboratories at the Center for Energy and Environmental Resources at the University of Texas' J. J. Pickle Research Campus. Five separate laboratories totaling 6,000 square feet are devoted to building energy and environments research on the J. J. Pickle Research Campus. These laboratories are used for experiments using physical simulation systems, preparation for field studies, instrumentation calibration and maintenance, and analysis of samples collected in the field or in laboratory. The laboratories contain a wide range of instruments and facilities and among the physical simulation systems are a 1,200-square-foot test house, three full scale test rooms with state-of-the-art environment control systems, a variety of small chambers for testing emissions from building materials, human simulators such as a thermal manikin with breathing systems, and a family of wind tunnels for testing various components of heating, ventilation, and air conditioning systems (HVAC).

**Construction engineering and project management.** The construction laboratories include a well-equipped computer cluster on the main campus and a high-bay laboratory for construction automation research at the J. J. Pickle Research Campus. Software includes three-dimensional computer-assisted drafting and modeling packages, statistical packages, construction project management software, discrete modeling and simulation packages, advanced communication hardware, and software developed through research. The program also has access to the Texas Advanced Computing Center Visualization Laboratory, which makes available various world-leading research and teaching infrastructure such as a 307 Mpixel display and a large-scale, tiled display supporting 32-point multi-touch for collaborative manipulation. Students also benefit from the many facilities under construction on campus and in the surrounding community as living laboratories for class visits and research studies.

**Infrastructure Materials Engineering.** The graduate program in infrastructure materials engineering emphasizes the characterization and testing of materials such as asphalt, cement, aggregates, concrete, steel, masonry, wood, polymers, and composites. Research and coursework focus on the materials science, property development, field performance, durability, forensics, and repair of infrastructure materials. The Laboratory for Infrastructure Materials Engineering (LIME) is located at the J. J. Pickle Research Campus. Excellent facilities are available for proportioning and batching concrete, mechanical testing, and durability testing, including both accelerated tests and outdoor exposure sites. The laboratory has the capability to perform a wide range of materials tests, including freezing and thawing, alkali-silica reaction, shrinkage, creep, aggregate characterization, rapid chloride, and corrosion evaluation. Microscopes, x-ray diffraction, thermal analysis instrumentation, and rheometers are also available. The Infrastructure Materials Performance and Characterization (IMPACT) laboratory is located in Ernest Cockrell Jr. Hall and is dedicated to the characterization and testing of asphalt binders and mixtures. The lab includes facilities to synthesize different asphalt binders, fabricate test specimens and evaluate them under a variety of

different temperature and loading rate conditions. In addition to the above labs, students also take advantage of central facilities such as UTCT for X-ray CT and Texas Materials Institute for materials investigation using tools such as gel permeation chromatograph, atomic force microscope, scanning electron microscope etc.

#### **Environmental and water resources engineering.**

*Program.* This program is designed to educate engineers who will solve environmental and water resources problems by applying concepts of sustainability and fundamental principles from the natural sciences, mathematics, mechanics, economics, and other underlying disciplines. To achieve this objective, the program offers a breadth of possible research and study areas. The faculty is one of the largest and most diverse in the nation, with expertise ranging from environmental fluid mechanics to water resources planning and from pollutant transport to treatment processes. The major areas of emphasis are treatment process engineering, air resources engineering, environmental remediation, water quality, water resources engineering, and ocean engineering. Because the program requires no specific courses, each student's education can be designed to meet his or her goals. The faculty offers a wide variety of courses, and students may choose courses in other related fields, such as chemical engineering, chemistry, geology, mathematics, microbiology, petroleum engineering, physics, and public policy. Once a student chooses a particular study area, he or she works closely with the faculty member or members conducting research in that area. Each student's program of study includes a balanced combination of coursework, seminars, and research. Well-equipped research laboratories, state-of-the-art instrumentation, and superb computation facilities support the graduate program, as do cooperation and coordination with research faculties and laboratories in physical, chemical, biological, and social sciences and other engineering disciplines.

*Facilities.* Environmental and water resources engineering laboratories are well-equipped for both basic and applied state-of-the-art research in virtually all environmental and water resources areas. On campus, the program has twenty thousand square feet of space on three floors of Ernest Cockrell Jr. Hall for physical, chemical, and biological analyses and for research on water, wastewater, and hazardous waste treatment processes. Facilities include a clean room for metal or particulate analysis, four laboratories with temperature and humidity control, numerous hoods for the safe handling of hazardous chemicals and biological samples, and an instrumentation laboratory for characterization of analysis of environmental samples in air, water, and soil matrices. Additional analytical equipment is available in other departments on the main campus.

The Computational Hydrodynamics Laboratory in Ernest Cockrell Jr. Hall has a high-performance computer cluster (sixteen nodes of eight cores each, Intel Xeon E5420 processors). This cluster provides the necessary platform for solving nonlinear flow problems about complex hull and/or propulsor geometries (involving cavities or free surfaces), and for developing algorithms for the design of efficient propeller or tidal turbine blades using nonlinear optimization techniques.

The Program in Air Resources Engineering maintains five thousand square feet of laboratory space in five laboratories at the Center for Energy and Environmental Resources. These laboratories also include facilities for studying outdoor sources of volatile organic compounds and indoor sources and sinks of volatile chemicals. A wide range of instrumentation is available for field monitoring in both indoor and outdoor environments. The Center for Energy and Environmental Resources also maintains extensive computational resources for air quality modeling and energy and climate change research.

The Center for Research in Water Resources is located at the J. J. Pickle Research Campus. Computational research focuses on applications of

geographic information systems using ArcInfo and ArcView, simulation of pollutants in soil and groundwater, and assembly and synthesis of historical water quantity and quality information. The experimental research uses scaled physical models, models of innovative wastewater treatment facilities, and field monitoring of water quality. The twenty-four-thousand-square-foot laboratory includes general- and special-purpose fixed and tilting channels and instrumentation and data acquisition systems for laboratory and field studies.

**Geotechnical engineering.** This program is designed to offer students a broad range of activities with a solid basis in the core areas of geotechnical engineering. Graduates receive a strong background in the basics through courses in geotechnical engineering, which offer the foundation for a successful professional career. In addition, the program exposes students to research activities that are at the forefront of developments in the field.

The geotechnical engineering laboratories are located in the Ernest Cockrell Jr. Hall and at the Pickle Research Campus. The laboratories include modern workstations for conducting standard geotechnical tests, including index tests, flexible wall permeameter tests, one-dimensional and triaxial consolidation, direct shear tests, and triaxial shear tests.

The soil dynamics laboratory has extensive facilities for combined resonant column and torsional shear testing. Large-scale multimode equipment is available for dynamic laboratory testing with specimens up to 0.3 meters in diameter. The geosynthetics laboratory includes tensile testing devices, a large-scale pullout testing device, large-scale time-temperature testing equipment, as well as specialized interface shear tensile devices. The unsaturated soils laboratory includes pressure plate testing devices, hanging columns, infiltration column systems, and multiple calibration chambers.

The ground improvement/pore fluid engineering research laboratories include one cyclic direct simple shear and one cyclic triaxial device; both devices can be run under static/cyclic loading with stress/strain complete servo control. Special setups for testing grouted soils, including static triaxial setups, are available as well. The laboratories have an advanced rheometer that can measure the engineering properties of fluids, suspensions, and gels. The facilities also include a multi-use dynamic/static (MUDS) testing setup that consists of a shaking table with a laminar box mounted on top of it. The MUDS testing setup allows for running 1-D 1-g free top shaking table tests on large specimens (1m x 0.5m x 0.5m with shaking along the 1m direction). The setup allows for running large scale static and cyclic simple shear tests as well as direct shear tests at confining stresses up to 200 kPa.

The rock mechanics laboratory is equipped to carry out uniaxial and triaxial tests with confinement of up to 70 MPa and with the possibility of controlling the pore pressure up to 70 MPa; and direct shear tests both in stiffness control and in load control; all of the above equipment is completely servocontrolled, and any sensor may be used to program the tests. Additional rock testing capabilities include: slake durability, point load, Brazilian (indirect tensile), Cerchar, brittleness, Sievers' J, abrasion value (on rock and soil), rebound hardness (Schmidt Hammer), pulse velocity and dynamic elastic constants, swelling, unit weight, porosity, and water content.

The centrifuge laboratory includes a high G-level centrifuge permeameter that was developed with the specific objective of expediting the measurement of the hydraulic characteristics of soils. It includes a water flow control system and an in-flight data acquisition system capable of collecting data under accelerations in excess of 500 Gs. In-flight instrumentation includes systems suitable to measure the infiltration rate (flow pump and outflow transducer), volumetric water content (time domain reflectometry), matric suction (tensiometers), and volumetric

changes (displacement transducers). A small prototype centrifuge is also available in the laboratory for hydraulic testing of soil samples.

For model studies of foundation systems, two large test tanks are available together with loading and tracking systems to install, monitor, and load a variety of foundation types. Equipment available for field measurement programs includes fiber optical strain gauges, inclinometers, and time domain reflectometry moisture probes.

A large-scale calibration chamber is available for testing 2.1-meter cubical samples under three-dimensional states of stress for dynamic, cyclic, and static conditions. A second calibration chamber is available for testing in situ tools and model foundations. For dynamic field testing, the program has a broad array of equipment for measuring in situ stress wave velocities using borehole and surface wave methods, as well as vane, cone, and dilatometer devices. A vibroseis truck, which is capable of applying static, cyclic, and dynamic loads up to fifty thousand pounds, is available for field measurements at geotechnical, foundation, and pavement sites. Three hydraulic shakers, field instrumentation, and teleparticipation equipment are available to the department as a participant in the Network for Earthquake Engineering Simulation (NEES).

### **Mechanics, Uncertainty, and Simulation in Engineering (MUSE).**

The graduate program in MUSE aims at preparing students to address the increasingly complex engineering problems modern societies face, through multi-disciplinary training rooted in applied mechanics, applied mathematics, and computational modeling. Students are expected to take courses reflective of the interdisciplinary character of the program.

Graduate students pursuing a thesis-option Master of Science degree or doctoral studies are exposed to the program's research activities. Current research endeavors focus on model-based simulation of challenging multi-physics and multi-disciplinary engineering problems. Examples include the modeling of the dynamic response of structures; performance of structures in the offshore environment; structural response under extreme loads (wind, earthquake, hurricane, blast, etc.); soil-structure interaction problems under seismic loads; inverse problems and the non-destructive condition assessment of engineered and natural systems; structural reliability and uncertainty quantification problems; the performance of subsea systems, pipelines, and energy-generating systems such as wind turbines and hydrokinetic devices; the modeling of deterioration and aging processes afflicting the infrastructure; the modeling of material behavior; the propagation of waves and their interactions; and problems in computational engineering. Though the program's focus derives chiefly from problems affecting the infrastructure and the built environment, our reach goes well beyond as we seek to address bigger societal questions related to energy, natural and man-made disasters, and physical/natural processes at various temporal and spatial scales. Research projects integrate theoretical results and computational modeling with experimental studies, where appropriate.

MUSE graduate students and faculty conduct research using various computational facilities within the department and the University of Texas. These include two computational laboratories within the Ernest Cockrell Junior Building (ECJ): the MUSE laboratory (ECJ 4.602), and the MUSE *too* laboratory (ECJ 3.301), occupying approximately 1,200 square feet. The two laboratories are equipped with several high-end workstations, including multi-processor and multi-core computers. For research projects demanding supercomputing resources, students and their faculty advisers have access to the Texas Advanced Computing Center's (TACC) massively parallel systems and visualization resources.

**Ocean engineering.** Students interested in ocean engineering and in offshore structures may develop an appropriate course of study in consultation with the faculty. These programs are typically interdisciplinary, including work in hydrodynamics, structural analysis and dynamics, steel design, soils and foundations, and computational

methods. Students may also participate in the work of the Offshore Technology Research Center.

**Structural engineering.** The graduate program in structural engineering addresses the analysis and design of reinforced and prestressed concrete, timber, steel, masonry, and composite structural systems. Extensive experimental research facilities are available for the observation and study of the behavior of structures under a variety of loadings.

Most of the experimental studies in structural engineering are conducted in the Phil M. Ferguson Structural Engineering Laboratory, located at the J. J. Pickle Research Campus. Ferguson Laboratory is one of the largest, best-equipped structural research facilities in the world. Multistory structures and full-size multigirder bridge structures have been tested. The laboratory contains three test slabs, 40' x 80', 40' x 60', and 30' x 60'. One of the test floors surrounds a 600-kip universal test machine that permits testing full-size plate girders. In addition, a unique three-dimensional test facility consisting of a 44' x 32' test floor, combined with two perpendicular vertical walls, each nineteen feet high, permits three-dimensional loading. Fatigue testing capabilities permit study of full-size components under random amplitude and frequency to simulate actual service conditions. A number of closed-loop servo-controlled loading systems are available. Cables, such as those used in cable-stayed bridges, can be tested in fatigue up to loads of three million pounds in the cable testing facility. A materials-testing facility is also located in the Ferguson Laboratory. For structural fire engineering research, test frames and furnaces are available for elevated temperature tests of structural materials, components, and connections. Data acquisition systems are available that are suitable for static, dynamic, and fatigue loading programs. The systems are controlled by the laboratory's own computer systems. Direct access to the main University computer facility is also available.

Excellent computational facilities are available to all students in structural engineering in support of both instructional and research activities. These include: (1) the Civil Engineering Learning Resource Center (LRC), a general-use, twenty-four-hour access facility equipped with more than 150 workstation-class computers ranging from single-core/single-processor to multicore/multiprocessor machines and several dedicated color laser printers, plotters, and flatbed scanners; (2) the Virtual Design Lab, a smaller computational facility equipped with several workstations that provide students with access to the latest suite of high-end CAD and graphics software; (3) a student lounge equipped with computational centers that can be used for team projects; (4) a graduate student computational laboratory equipped with high-end workstations dedicated to research activities; and (5) a similarly equipped graduate computational laboratory housed at the Ferguson Structural Engineering Laboratory. In addition, for research demanding supercomputing resources, students and their faculty advisers have access to the Texas Advanced Computing Center's (TACC) supercomputers, which include Ranger, currently the largest open-science computing system in the world, featuring 62,976 computing nodes, 123 TB of aggregate memory, and peak performance of about 0.5 petaFLOPS. The TACC also provides access to other massively parallel systems and visualization clusters. Access to computational resources is facilitated through the network infrastructure that comprises both wired and wireless segments; the wireless network covers most of the University's main campus.

**Transportation engineering.** The University's proximity to the headquarters of governmental transportation agencies provides ready access to the facilities and records of these organizations by graduate students, in planning, behavioral modeling and demand prediction, geometric and structural design, large-scale infrastructure systems analysis and optimal resource allocations, policy making, and operation of streets, highways, and transit and non-motorized transportation systems. The Center for Transportation Research administers an

extensive cooperative research program with the Texas Department of Transportation, the United States Department of Transportation, as well as a spectrum of sponsored projects with other agencies, including the Transportation Research Board, and the National Science Foundation.

Equipment for specialized and routine testing of materials used for constructing and maintaining transportation facilities is available. The bituminous materials laboratory includes state-of-the-art asphalt binder and asphalt concrete testing equipment, an environmental control chamber, and mix preparation and aggregate handling facilities.

Facilities are provided for studying traffic operations, including traffic volume counters, speed meters, motor-driven movie cameras, video cameras and recorders, projectors, portable delay recorders, and other special measuring and recording equipment.

The Transportation Infrastructure and Information Systems Laboratory provides the capability to conduct research in analysis and simulation of large-scale infrastructure systems. The Transportation Equilibrium, Simulation, and Optimized Networks Laboratory allows research on large-scale complex networks with a focus on transportation systems. In addition, the University's high-performance computers and hardware and software in the department's Learning Resources Center are available to support research in transportation networks, infrastructure systems, land uses, and traffic operations.

**Libraries.** In addition to the Perry-Castañeda Library and libraries in physics and mathematics, geological sciences, life sciences, and chemistry, a complete library of books, periodicals, and society proceedings in civil engineering is housed in the McKinney Engineering Library.

## Areas of Study

Civil engineering majors may specialize in building energy and environments; construction engineering and project management; infrastructure materials engineering; environmental and water resources engineering; geotechnical engineering; mechanics, uncertainty, and simulation in engineering; ocean engineering; structural engineering; or transportation engineering. In addition, the Department of Civil, Architectural, and Environmental Engineering offers the Master of Science in Engineering with a major in environmental and water resources engineering.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

David T Allen  
 Joshua Apte  
 Michael E Barrett  
 Oguzhan Bayrak  
 Halil Berberoglu  
 Amit Bhasin  
 Chandra R Bhat  
 Stephen Boyles  
 Carlos H Caldas  
 Randall J Charbeneau  
 Christian Claudel  
 Patricia Clayton  
 Richard L Corsi  
 Brady R Cox  
 Chadi Said El Mohtar  
 Michael D Engelhardt  
 Ofodike A Ezekoye  
 Gregory L Fenves  
 Raissa Patricia Ferron  
 Kevin J Folliard  
 David W Fowler  
 Benny D Freeman  
 Wassim M Ghannoum  
 Robert B Gilbert  
 Todd A Helwig  
 Ben R Hodges  
 Trevor Daniel Hrynyk  
 James O Jirsa  
 Maria G Juenger  
 Loukas F Kallivokas  
 Lynn E Katz  
 Spyridon A Kinnas  
 Kerry A Kinney  
 Mary Jo Kirisits

Kara Kockelman  
 Desmond F Lawler  
 Fernanda L Leite  
 Howard M Liljestrand  
 Randy B Machemehl  
 David R Maidment  
 Lance Manuel  
 Elena C McDonald-Buller  
 Daene C McKinney  
 Atila Novoselac  
 William J O'Brien  
 James T O'Connor  
 Jon E Olson  
 Paola Passalacqua  
 Gary A Pope  
 Jorge A Prozzi  
 Ellen M Rathje  
 Danny D Reible  
 Navid Saleh  
 Gerald E Speitel Jr  
 Kenneth H Stokoe II  
 John L Tassoulas  
 Eric Van Oort  
 C Michael Walton  
 Michael E Webber  
 Charles J Werth  
 Dan L Wheat  
 Eric B Williamson  
 Sharon L Wood  
 Ying Xu  
 Zhanmin Zhang  
 Jinying Zhu  
 Jorge G Zornberg

program of coursework only, according to procedures set by the Graduate Studies Committee.

Majors for the master's degree may be chosen in any area or combination of areas listed under Areas of Study (p. 142).

## Doctor of Philosophy

To be admitted to candidacy for the doctoral degree, the student must pass a preliminary (qualifying) examination administered by a committee, appointed by the graduate adviser, of at least three members of the civil engineering faculty, two of whom may be in the major area. This examination must be taken before the student registers for the second semester beyond the Master of Science in Engineering degree. The student must also submit a Program of Work that is approved by the chair of the civil engineering Graduate Studies Committee and the graduate dean. All students must demonstrate proficiency in English.

When the student has been admitted to candidacy, a dissertation committee is appointed by the graduate dean. When the student has completed most of his or her coursework, the dissertation committee administers a comprehensive examination in the major.

The defense of the dissertation is the final examination of the Doctor of Philosophy degree program. This examination is scheduled after the members of the dissertation committee have received a final draft of the dissertation that has been approved by the supervising professor.

## Dual Degree Program

The Department of Civil, Architectural, and Environmental Engineering offers the following dual degree program in cooperation with the Lyndon B. Johnson School of Public Affairs. More information is available from the graduate adviser in each program.

Field(s) of Study	Degree(s)
Public affairs	Master of Public Affairs

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Civil Engineering: C E

#### C E 380P. Ocean Engineering Principles: Theory and Applications.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; and a course in differential equations and a course in fluid mechanics, or consent of instructor.

**Topic 4: Boundary Element Methods.** Formulation and numerical implementation of boundary element methods; applications to problems in fluid mechanics, structural analysis, and solid mechanics.

**Topic 5: Hydrodynamics of Marine Propulsors and Turbines.** Hydrofoil and lifting surface theory, actuator disk and lifting line theory, modeling via vortex lattice, panel methods, and Reynolds-Averaged Navier-Stokes solvers, optimum loading and blade design techniques for propellers and turbines, unsteady blade and shaft forces, and modeling of sheet cavitation. Civil Engineering 380P (Topic 5) and 397 (Topic 32: Hydrodynamics of Propulsors and Dynamic Positioning

## Admission Requirements

A Bachelor of Science degree from a program in engineering accredited by ABET is the general prerequisite for admission to a graduate program in civil engineering. An applicant whose training does not meet this prerequisite may be accepted but will be required to pass a sequence of courses stipulated by the Graduate Studies Committee that will make up the deficiencies in undergraduate preparation. A list of the required courses is available from the graduate adviser.

## Degree Requirements

Full-time students, and both teaching and research assistants, are required to register for nine semester hours of coursework during each long-session semester. These nine hours may include special problems, seminar, thesis, and dissertation courses.

## Master of Science in Engineering

Students who follow the thirty-semester-hour plan with thesis must complete a major in civil engineering consisting of eighteen to twenty-four semester hours, including the thesis course, and a minor of six to twelve semester hours outside the area of concentration. Included in the major and minor must be at least eighteen semester hours in engineering. The courses must be logically related and the individual program must be approved by the graduate adviser.

A thirty-semester-hour degree plan is also available under the report option, which includes a report prepared in Civil Engineering 398R according to procedures set by the Graduate School; and under an option that includes a report prepared in Civil Engineering 398D, or an approved

Systems) may not both be counted. Additional prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **C E 380S. Environmental Fluid Mechanics.**

Fundamentals of fluid mechanics applied in natural systems; analysis of energy; momentum, diffusion, turbulence, and stratification in lakes, rivers, and estuaries. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Civil Engineering 319F or consent of instructor.

### **C E 380T. Computational Environmental Fluid Mechanics.**

Basics of numerical methods as applied to the solution of the steady and unsteady fluid flow equations, such as the Euler and the Navier-Stokes equations and the advection-diffusion equation. Emphasis on finite volume methods as applied to fluid mechanics problems in civil and environmental engineering. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Civil Engineering 380S or an equivalent graduate course in fluid mechanics, and knowledge of a programming language.

### **C E 380W. Water Resources Engineering Research Seminar.**

Presentations and discussions on various topics in water resources engineering. Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **C E 381E. Design of Energy Efficient and Healthy Buildings.**

Design of buildings for low energy use and optimal indoor air quality. Includes ventilation, energy efficiency, moisture problems, and prevention by design. Three lecture hours a week for one semester. Prerequisite: Graduate standing in engineering or consent of instructor.

### **C E 381P. Computer Methods in Structural Analysis.**

Linear and nonlinear analysis of trusses and frames; introduction to structural stability; and computational aspects of linear and nonlinear structural analysis. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **C E 381R. The Finite Element Method.**

Introductory concepts; weighted residual methods; strong and weak forms; boundary conditions; global v. local basis functions; error estimates; smooth and nonsmooth problems; one-dimensional second- and fourth-order problems; two-dimensional potential and plate problems; two-dimensional and three-dimensional elasticity; dynamic and eigenvalue problems; numerical, computational, and meshing issues; applications using commercial software. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Civil Engineering 381P or consent of instructor.

### **C E 381T. Numerical Modeling of Physical Systems.**

Survey of numerical methods; weighted residuals, finite differences, finite elements, boundary elements; applications to equilibrium, eigenvalue, and propagation problems. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **C E 381W. Introduction to Wave Physics.**

An introductory course in the theory and modeling of propagating waves. Subjects may include scalar waves in 1-D and 2-D, traveling and standing waves, flexural waves in beams, dispersion, phase and group velocity, vector waves in 2-D and 3-D, waves in infinite media and semi-infinite media, P waves, SH waves, SV waves, Rayleigh and Love surface waves, Stoneley waves, reflection and transmission at interfaces, numerical modeling, radiation conditions, scattering and radiation from obstacles, and fluid-solid interaction. Three lecture hours a week for one

semester. Civil Engineering 381W and 397 (Topic: Wave Propagation Analysis) may not both be counted. Prerequisite: Graduate standing.

### **C E 382L. Plastic Design in Metals.**

Principles and methods of plastic analyses and design, and their applications to continuous beams, frames, plates, connections, and multistory buildings. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Civil Engineering 335, and consent of instructor.

### **C E 382N. Structural Systems.**

Application of systems engineering principles to planning, design, and construction of building and bridge structures with emphasis on performance requirements and economic factors. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **C E 383C. Experimental Methods in Structural Engineering.**

Survey of experimental methods used in structural engineering, including loading and measurement techniques and systems used in structural research. Two lecture hours and three laboratory hours a week for one semester. Prerequisite: Graduate standing.

### **C E 383D. Steel Bridge Design.**

Design of steel highway bridges, including the analysis and design of composite girder, box girder, and cable-stayed bridges. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Civil Engineering 362N or the equivalent.

### **C E 383F. Structural Fire Engineering.**

Behavior and design of structures subjected to fire; heat transfer fundamentals and modeling of fires; material properties at elevated temperature; structural fire resistance and protection; calculating structure-fire response. Three lecture hours a week for one semester. Civil Engineering 383F and 397 (Topic: Structural Fire Engineering) may not both be counted. Prerequisite: Graduate standing.

### **C E 383L. Advanced Reinforced Concrete Members.**

Behavior of reinforced concrete members; critical review of specifications; limit states; anchorage and development of reinforcement; shear; torsion. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Civil Engineering 331, and consent of instructor.

### **C E 383N. Advanced Reinforced Concrete Structures.**

Behavior of reinforced concrete structures, with emphasis on ductility and detailing of frames, slabs, and braced (shearwall) structures. Detailing for seismic loads. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Civil Engineering 383L, and consent of instructor.

### **C E 383P. Prestressed Concrete.**

Theory, advantages, and limitations; various systems of prestressing; composite construction; continuous span theory. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Civil Engineering 331, and consent of instructor.

### **C E 383R. Repair and Strengthening of Reinforced Concrete Structures.**

Evaluation of condition, strength, serviceability, and ductility of existing structures; criteria for rehabilitation; retrofit techniques for change in function, loading, and seismic forces. Three lecture hours a week for one semester. Civil Engineering 383R and 397 (Topic: Repair and Strengthening of Reinforced Concrete Structures) may not both be counted. Prerequisite: Graduate standing and consent of instructor.



### **C E 383S. Structural Concrete Bridges.**

Planning, design, and construction of reinforced concrete and prestressed concrete bridges, including arch, frame, girder, and cable stay systems; aesthetics, economy, and durability. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and credit or registration for Civil Engineering 383P.

### **C E 383T. Plasticity in Structural Concrete.**

Application of plasticity theory to structural concrete columns, girders, frames, and joints. Development and application of transparent detailing methods such as truss models, strut-and-tie models, and both strip and yield line methods for slabs. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Civil Engineering 383L, and consent of instructor.

### **C E 384P. Dynamic Response of Structures.**

Single and multidegree-of-freedom systems; dynamic load factors, response to harmonic excitation; damping; modal analysis; direct integration of equations of motion; analysis in time and frequency domains; application to earthquake, wind, wave, and traffic loadings. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Civil Engineering 381P or consent of instructor.

### **C E 384R. Earthquake Engineering.**

Earthquake characteristics; seismic loads; elastic and inelastic response; analysis and design of buildings for earthquakes. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Civil Engineering 384P or consent of instructor.

### **C E 384S. Structural Reliability.**

Load and resistance factors in reliability-based design; first- and second-order reliability methods; Monte Carlo simulation techniques with variance reduction and importance sampling refinements; reliability of systems; fault-tree and event-tree models; inverse reliability procedures; and random fields and stochastic finite element analysis for reliability analysis. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **C E 384T. Blast-Resistant Structural Design.**

Physics of explosions and basic blast phenomenology; structural loading due to blast effects; nonlinear dynamic response of blast-loaded structures; protective design; progressive collapse. Three lecture hours a week for one semester. Civil Engineering 384T and 397 (Topic: Blast-Resistant Structural Design) may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **C E 385D. Water Resources Planning and Management.**

Application of engineering economics, microeconomic theory, and operations research to the planning and management of water systems; major topics include flood control, hydroelectric power, water supply, multiobjective planning, and urban water resource management. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **C E 385G. Transboundary Water Resources.**

Introduction to planning, policy, and development of water resources in the international setting, with emphasis on transboundary situations. Basic concepts of water rights and international law pertaining to transboundary water use and protection; economic analysis and applications to transboundary water resources problems; international development goals and how these relate to water supply and use. Three lecture hours a week for one semester. Civil Engineering 385G and 397 (Topic: Transboundary Water Resources) may not both be counted. Prerequisite: Graduate standing.

### **C E 385J. Hazardous Waste Management.**

Legal and technological approaches to effective and sustainable control of hazardous wastes and contaminated sites, studied through problem evaluation and solution. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Civil Engineering 342 or consent of instructor.

### **C E 385K. Water Quality.**

Analysis of water quality in natural systems and of effects of wastewater discharges. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### **Topic 1: Stream, Impoundment, and Estuarine Analysis I.**

Basic physical, chemical, and biological properties of streams, impoundments, estuaries, and coastal waters; methods for analysis of water quality problems. Additional prerequisite: Graduate standing.

#### **Topic 2: Stream, Impoundment, and Estuarine Analysis II.**

Application of methods of analysis to development of a water quality management plan for a water body in Texas. Additional prerequisite: Graduate standing.

**Topic 3: Water Quality Modeling.** Mathematical modeling of water quality, including dissolved oxygen, nutrients, and toxic substances in lakes, reservoirs, rivers, and estuaries. Additional prerequisite: Graduate standing.

**Topic 4: Water Pollution Ecology.** Advanced topics in the application of engineering solutions to ecological problems in freshwater and marine environments.

### **C E 385L. Water and Wastewater Treatment.**

Principles of sustainable treatment of domestic and industrial water, wastewater, and sludges. Three lecture hours or two and one-half lecture hours and one laboratory hour a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Physical and Chemical Treatment.** Three lecture hours a week for one semester. Additional prerequisite: Civil Engineering 342 or consent of instructor.

**Topic 2: Biological Wastewater Treatment and Sludge Processing.** Three lecture hours a week for one semester. Additional prerequisite: Civil Engineering 342 or consent of instructor.

**Topic 3: Advanced Treatment Processes.** Project-based course addressing advanced topics in treatment process design: alternative designs, computer models, laboratory testing, economics, and least-cost designs. Two and one-half lecture hours and one laboratory hour a week for one semester. Additional prerequisite: Civil Engineering 385L (Topic 1).

### **C E 385M. Unit Operations in Water and Wastewater Treatment.**

Physical, chemical, and biological unit operations for sustainable water and wastewater treatment. One lecture hour and six laboratory hours a week for one semester. Prerequisite: Graduate standing, and Civil Engineering 385L (Topic 1: Physical and Chemical Treatment or Topic 2: Biological Wastewater Treatment and Sludge Processing) or consent of instructor.

### **C E 385N. Industrial Wastewater Treatment.**

Industrial wastewater characteristics; methods of in-plant control; application of various biological, chemical, and physical processes in practical water pollution control systems. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and credit or registration for Civil Engineering 385L or consent of instructor.

### **C E 385R. Land Treatment of Wastes.**

Principles of the use of land in management of municipal and industrial wastewaters, sludges, and solids; includes problem evaluations. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Civil Engineering 342 or consent of instructor.

### **C E 385S. Stochastic Hydrology.**

Probability and statistics applied to the solution of hydrological problems; extreme event frequency analysis, time series analysis of hydrologic data, autocorrelation and spectral analysis, theory of regionalized variables and applications. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Civil Engineering 311S or an equivalent course in statistical methods.

### **C E 385W. Drinking Water: Treatment and Public Health Issues.**

Fundamentals and applications of drinking water treatment processes, interactions among treatment processes, source water quality, and public health issues. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Civil Engineering 385L (Topic 1: Physical and Chemical Treatment), and consent of instructor.

### **C E 386M. Water Treatment and Wastewater Treatment Plant Design.**

Design of water and wastewater treatment facilities; pumps and hydraulic considerations; design of wastewater collection systems; design of systems for handling and disposal of residuals. Specific facilities may be selected to meet individual interests. Six hours of lecture and design laboratory a week for one semester, with appropriate field trips to operating facilities. Prerequisite: Graduate standing, and credit or registration for Civil Engineering 385L or consent of instructor.

### **C E 386P. Engineering Fracture Mechanics.**

Application of fracture mechanics to fracture-safe design of metal structures; material behavior and analysis of components containing cracks. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **C E 386R. Inelastic Behavior of Materials.**

Introduction to theories of inelastic behavior; theory of plasticity; applications to materials such as steel, concrete, and soils; implementation of constitutive equations in structural analysis. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **C E 387C. Geoenvironmental Engineering.**

Hydraulic conductivity of soils; clay behavior; compacted clay barriers; unsaturated soil behavior and barriers; geosynthetics and geosynthetic barriers; contaminants and solid waste; liquid drainage layers; stability of landfills; contaminant transport through barriers. Three lecture hours and three laboratory hours a week for one semester. Prerequisite: Graduate standing.

### **C E 387G. Engineering Geology.**

Fundamental concepts of geology, including geologic time and plate tectonics. Interactions among earth materials, landforms, and geologic processes across a range of spatial and temporal scales. Emphasizes common interests shared by engineers and geologists, as well as gaps between the disciplines, such as those posed by the geologic vocabulary. Three lecture hours and three hours of laboratory or fieldwork a week for one semester. Prerequisite: Graduate standing in civil engineering.

### **C E 387L. Soil Mechanics I.**

Three lecture hours a week for one semester; some topics require additional hours. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### **Topic 1: Consolidation and Shearing Properties of Soils.**

Theoretical and experimental studies of the consolidation and shearing properties of both saturated and unsaturated soils. Three lecture hours and three laboratory hours a week for one semester.

**Topic 2: Foundation Engineering.** Bearing capacity, design of piers and pile foundations.

### **C E 387M. Soil Mechanics II.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Stability of Earth Slopes.** Development and application of limit equilibrium procedures, including effects of seepage, rapid drawdown, and seismic loading and reinforcement for stability analysis of natural and constructed slopes.

### **C E 387R. Soil Mechanics III.**

Three hours a week for one semester; some topics may require additional hours. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 2: Soil and Rock Dynamics.** Wave propagation in soil and rock, foundation vibration and isolation, dynamic behavior of soil. Five hours a week for one semester, including lecture and laboratory.

**Topic 4: Earth Retaining Structures.** Types of earth retaining systems, earth pressure theory; gravity, semi-gravity, and modular walls; reinforcing elements; mechanically stabilized earth walls and reinforced soil slopes; soil nail walls; sheet pile walls, drilled shaft walls and anchored walls; advances in soil reinforcement.

**Topic 5: Geotechnical Earthquake Engineering.** Application of soil dynamics to earthquake engineering; influence of soil conditions on ground motion characteristics; evaluation of site response using wave propagation techniques; liquefaction of soils; liquefaction mitigation; seismic response of earth structures; seismic slope stability.

### **C E 387T. Decision, Risk, and Reliability.**

Principles and theory for modeling uncertainty in civil engineering, analyzing how uncertainties affect performance, and developing rational bases for design and decision making under uncertain conditions. Three lecture hours a week for one semester. Prerequisite: Graduate standing and an introductory course in probability and statistics.

### **C E 388N. Engineering and Management of Municipal and Industrial Residuals.**

Characterization and collection of solid wastes; biological, chemical, and physical principles and integrated systems applicable to the treatment and disposal of municipal and industrial residuals. Two lecture hours and three discussion hours a week for one semester, with occasional field trips. Prerequisite: Graduate standing in civil or environmental engineering, or graduate standing and consent of instructor.

### **C E 389C. Advanced Technical Communication for Engineers.**

Advanced work in theory and practice of communicating research and design results to a variety of audiences, in print, orally, and through multimedia. Students use their own work and writing projects as the material to communicate. Three hours a week for one semester, including lecture and laboratory. Prerequisite: Graduate standing.

**C E 389H. HVAC Design.**

Design of heating, ventilation, and air-conditioning systems. Three lecture hours a week for one semester. Prerequisite: Graduate standing and three of the following courses: Architectural Engineering 346N, Civil Engineering 319F, Mechanical Engineering 320, 326, 330, 339.

**C E 389T. Indoor Air Quality: Transport and Control.**

Transport and control of indoor pollutants. Includes particulate removal and pollutant transport into and within indoor environments. Three lecture hours a week for one semester. Prerequisite: Graduate standing in architectural or civil engineering.

**C E 389V. Modeling of Air and Pollutant Flows in Buildings.**

Same as Architectural Engineering 389V. Restricted to architectural engineering or civil engineering graduate students. Fundamentals of indoor airflow modeling, use of computational fluid dynamics (CFD) for air quality and thermal comfort analyses, application of CFD for analysis of air velocity, temperature, humidity, and contaminant distributions with different ventilation systems. Three lecture hours a week for one semester. Only one of the following may be counted: Architectural Engineering 383 (Topic: Modeling of Air and Pollutant Flows in Buildings), 389V, Civil Engineering 389V, 397 (Topic: Modeling of Air and Pollutant Flows in Buildings). Prerequisite: Graduate standing; for architectural engineering and civil engineering majors, three semester hours of coursework in fluid dynamics; for others, consent of instructor.

**C E 390J. Engineering Microbiology.**

Fundamentals of microbiology and biochemistry as applied to environmental pollution and sustainable treatment processes, energetics and kinetics of microbial growth, and biological fate of pollutants; introduction to laboratory techniques. Three hours a week for one semester, including lecture and laboratory. Prerequisite: Graduate standing.

**C E 390L. Environmental Analysis.**

Advanced analytical procedures for the sampling, monitoring, and analyses of air, liquid, and other wastes. Six hours of lecture and laboratory a week for one semester. Prerequisite: Graduate standing, one year of chemistry, and consent of instructor.

**C E 390N. Water Pollution Chemistry.**

Advanced topics in the application of engineering solutions to chemical problems in freshwater and marine environments. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**C E 390P. Environmental Organic Chemistry.**

Advanced subjects in the environmental chemistry of organic contaminants in groundwater, soil, and air systems; includes sustainable chemistry. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**C E 390Q. Chemical Dynamics in the Environment.**

Environmental chemodynamics: interphase equilibrium, reactions, transport processes, and related models for anthropogenic substances across natural interfaces (air-water-sediment-soil) and associated boundary regions. Three lecture hours a week for one semester. Civil Engineering 390Q and 397 (Topic: Chemodynamics) may not both be counted. Prerequisite: Graduate standing.

**C E 390R. Engineering Microbiology Applications.**

Application of microbiology and molecular biology tools for monitoring environmental systems and biological treatment processes. Six hours of lecture and laboratory a week for one semester. Civil Engineering 390R

and 397 (Topic: Engineering Microbiology Applications) may not both be counted. Prerequisite: Graduate standing and Civil Engineering 390J.

**C E 391C. Analysis and Design of Transportation Systems I.**

Introduction to conceptual, methodological, and mathematical foundations of analysis and design of transportation services; review of probabilistic modeling; application of discrete choice models to demand analysis. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

**C E 391D. Analysis and Design of Transportation Systems II.**

Operations research techniques for modeling system performance and design of transportation services; routing and scheduling problems, network equilibration, and spatially distributed queueing systems. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

**C E 391E. Advances in Transportation Demand Analysis.**

Developments in the econometric and behavioral aspects of demand analysis and forecasting; supply-demand integration; dynamic models. Applications to passenger and freight transportation and other infrastructure services. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**C E 391F. Advanced Theory of Traffic Flow.**

Relations among traffic variables; distribution functions; single lane and multilane traffic flow; characterization of traffic in cities; kinematic waves; yellow signal dilemma; merging; fuel consumption; emissions; and special topics. Emphasis on the interplay among theory, experimentation, and observation. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

**C E 391H. Urban Transportation Planning.**

Interrelationship of transportation and the urban environment; methodologies for planning multimodal transportation systems and developing feasible alternatives; emphasis on developing insight into the transportation problem and the planning process rather than on solving specific problems of limited scope. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**C E 391J. Transportation Planning: Methodology and Techniques.**

Analysis of a wide range of planning studies to establish the logic and foundation for the transportation planning process. Emphasis on techniques of estimation and forecasting population, economic activity, land use, and mobility patterns; determination of goals and objectives; decision making; economic analysis; and alternative evaluation. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**C E 391L. Advanced Traffic Engineering.**

Characterization and analysis of arterial street and freeway traffic operations using theoretical and experimental techniques, especially computer simulation. Introduction to the most current analysis and optimization tools for control device design and implementation. Three lecture hours and three hours of supervised work a week for one semester. Prerequisite: Graduate standing and consent of instructor.

**C E 391M. Advanced Geometric Design.**

Geometric design of highways and guideways, including topics on levels of service, alignment, vehicle operations, intersection and interchange design, roadside design, lighting, and economics. Three lecture hours and one hour of supervised laboratory work a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **C E 391N. Engineering System Evaluation and Decision Making.**

Advanced methods for selection of transportation and other infrastructure systems in the presence of multiple criteria, multiple decision makers, and uncertainty. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **C E 391P. Highway and Airport Pavement Systems.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Theory and Behavior of Pavements.** Theories of pavement behavior and concepts of pavement design.

**Topic 2: Design and Performance of Pavements.** Pavement performance evaluation and the application of theory to the design of pavements.

**Topic 3: Pavement Management Systems.** Defines the interrelationships among all aspects of pavement technology. Application of computer-based management methodology.

### **C E 391Q. Bituminous Materials.**

Design and use of asphalt mixtures; chemical, physical, and rheological properties of asphalt; and practical applications in highways, airports, and other construction. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **C E 391R. Airport Design and Operation.**

Aircraft characteristics, site selection, airport configuration, capacity, terminal design, traffic control, and interfacing with other transportation modes. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **C E 391T. Contemporary Transportation Issues.**

Consideration, analysis, and evaluation of recent transportation-related innovations and developments. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **C E 391W. Transportation Systems Operations and Control.**

Concepts and advanced methods for the design of control strategies for transportation systems operations, including highway traffic systems (signalized street networks and freeways), transit systems, and private carrier operations, including airlines. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **C E 392C. Transportation Network Analysis.**

Transportation network analysis focusing on planning and optimization using static traffic assignment models. Subjects include deterministic and stochastic equilibrium, traditional and modern solution methods, shortest path algorithms, combined models, and basic nonlinear programming skills. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **C E 392D. Dynamic Traffic Assignment.**

Theory and practice of dynamic traffic assignment as an evolving field. Subjects include basic flow models (point queues, cell transmission model, and link transmission model), time-dependent shortest path algorithms, equilibrium algorithms (convex combinations, simplicial decomposition, and gradient methods), and case studies from practice. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **C E 392E. Acquisition and Analysis of Transportation Data.**

Methods and technologies for the acquisition and analysis of data on various aspects of transportation systems, including properties of different data sources and types; stated versus revealed preferences; traffic sensing; survey design; sampling strategies; probabilistic methods of data analysis; overview of statistical methods and various regression models, including random-utility, ordered-choice, simultaneous-equations, time-series, and spatial econometric models. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **C E 392L. Experimental Measurements of Soil Properties.**

Theoretical and practical knowledge of transducers, sensors, and data acquisition systems for soil and general laboratory testing. Experimental techniques used to characterize properties of geomaterials. Two lecture hours and three laboratory hours a week for one semester. Prerequisite: Graduate standing.

### **C E 392M. Public Transportation Engineering.**

Introduction to public transportation systems, including demand forecasting, operations, and design. Includes statistical methods, driver and vehicle scheduling, algorithms, and survey sampling techniques. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **C E 392N. Topics in Infrastructure Systems.**

Management principles, modeling techniques, computer applications, and emerging technologies for the analysis, engineering, and management of infrastructure systems. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Infrastructure Systems Management.** Concepts, principles, theories, and models for infrastructure management, with emphasis on civil infrastructure systems. Only one of the following may be counted: Civil Engineering 391V, 392N (Topic 1), 397 (Topic 5: Infrastructure Management Systems).

**Topic 2: Reliability and Maintainability of Infrastructure Systems.** Theory of reliability, maintainability, and availability and its application for the analysis of infrastructure systems. Civil Engineering 392N (Topic 2) and 397 (Topic: Reliability and Maintainability of Infrastructure Systems) may not both be counted.

**Topic 3: Intelligent Infrastructure Systems.** Concepts, frameworks, and models of intelligent infrastructure systems, with emphasis on the application of emerging technologies and advanced modeling techniques. Civil Engineering 392N (Topic 3) and 397 (Topic 37: Intelligent Infrastructure Systems) may not both be counted.

### **C E 392P. Sustainable Pavement Engineering.**

Pavement design; back calculation; use of locally available materials for pavement construction; recycled asphalt pavements and shingles; warm mix and cold mix asphalt; industrial by-products and waste incorporated in pavement materials; emerging technologies for sustainable pavement design and pavement management. Three lecture hours a week for one semester. Civil Engineering 392P and 397 (Topic: Sustainable Pavement Engineering) may not both be counted. Prerequisite: Graduate standing, and Civil Engineering 366K, 367P, 391P (Topic 2: Design and Performance of Pavements), 391Q, or consent of instructor.

### **C E 392R. Discrete Choice Theory and Modeling.**

Methods and statistics of model estimation, with emphasis on maximum-likelihood; individual choice theory; binary choice models; unordered multinomial and multidimensional choice models; sampling theory and sample design; ordered models and aggregate prediction with choice models; introduction to advanced concepts, such as unobserved population heterogeneity, joint stated preference and revealed preference

modeling, and longitudinal choice analysis. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing, and Civil Engineering 391J or consent of instructor.

### **C E 392S. Intermodal Transportation Systems.**

Strategic planning of intermodal freight transportation systems (infrastructure and rolling stock). Freight logistics, intermodal technology, and intermodal terminal operations. Intermodal freight transportation policy, planning, and operational systems and programs. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **C E 392T. Transport Economics.**

Application of economic theory and principles to transportation systems analysis and evaluation. Subjects include individual demand decisions, optimal private and public transport supply (including pricing strategies and input demands), market imperfections and externalities, and welfare-based transport policy. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **C E 392U. Transportation Systems Management.**

Evolving concepts of transportation agency organization, management, and delivery of transportation programs, products, and services. Separation versus integration of transport policymaking and service delivery functions; emerging models for delivering programs and services, such as outsourcing, privatization, and state-owned enterprises; review of national and international experiences with innovative approaches and the benefits and costs associated with change. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **C E 392V. Methods to Characterize Bituminous Materials.**

Introduction to the design and performance prediction of asphalt mixtures. Experimental and computational methods used to characterize the chemical and mechanical properties and performance of bituminous materials at several different length scales. Includes computational models. Three lecture hours a week for one semester. Civil Engineering 392V and 397 (Topic: Characterization of Bituminous Materials) may not both be counted. Prerequisite: Graduate standing, and Civil Engineering 366K, 391Q, or consent of instructor.

### **C E 392W. Characterization of Viscoelastic Materials.**

Test methods and physical models used to characterize the mechanical response of linear and nonlinear viscoelastic materials. Use of correspondence principles to solve simple boundary value problems for linear viscoelastic materials. Introductory topics on modeling damage and nonlinear response of viscoelastic materials. Three lecture hours a week for one semester. Civil Engineering 392W and 397 (Topic: Characterization of Viscoelastic Materials) may not both be counted. Prerequisite: Graduate standing.

### **C E 393. Advanced Concrete Materials.**

Comprehensive coverage of Portland cement concrete materials. Topics include cement and aggregate properties, chemical and mineral admixtures, concrete microstructure and the effects of chemical and mechanical properties, durability issues, concrete construction, and special concretes. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing, and Civil Engineering 314K or an equivalent materials course.

### **C E 393C. Experimental Methods in Cement Chemistry.**

Cement chemistry, hydration, and microstructural formation; analytical techniques used in the investigation of cement and concrete. Three lecture hours a week for one semester. Civil Engineering 393C and 397 (Topic: Experimental Methods in Cement Chemistry) may not both be

counted. Prerequisite: Graduate standing, Civil Engineering 351, 393, or the equivalent, and consent of instructor.

### **C E 393M. Environmental Engineering Research Seminar.**

Presentation and discussion of environmental topics in surface water, groundwater, air resources, and land resources. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **C E 393N. Novel Structural Materials.**

Material selection criteria, including mechanical and environmental factors; selected case studies of emerging materials, including derivation of properties and potential applications. Three lecture hours a week for one semester. Civil Engineering 393N and 397 (Topic: Novel Structural Materials) may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **C E 393S. Structural Engineering Research Seminar.**

The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **C E 394. Interaction of Soils and Structures.**

Beams on foundation, laterally loaded piles, applications of the finite-element method, beam-columns with nonlinear soil support, and behavior of pile groups. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and a course in soil mechanics or consent of instructor.

**Topic 1: Dynamic Soil-Structure Interaction.** Fundamentals of wave propagation; determination of foundation stiffnesses; mat foundations on the surface of a layered soil; embedded foundations; pile foundations; effect of foundation conditions on dynamic response of structures to applied loads (machine foundations) and to seismic excitation. Additional prerequisite: Consent of instructor.

### **C E 394K. Engineering Hydrology.**

Three lecture hours a week for one semester. With consent of instructor, any topic may be repeated for credit. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; and a basic course in hydrology and in differential equations, or consent of instructor.

**Topic 1: Groundwater Pollution and Transport.** Groundwater flow and hydrogeologic modeling, sources of contamination, multiphase partitioning, advection-dispersion transport and modeling.

**Topic 2: Surface Water.** Rainfall runoff processes, hydrograph theory, linear and nonlinear hydrologic system models, hydrologic and hydraulic streamflow routing, rainfall and flood flow frequency analysis, watershed models.

**Topic 3: Geographic Information Systems in Water Resources.**

Principles of geographic information systems, hydrology, and database management systems applied to water resources problems. Additional prerequisite: Consent of instructor.

### **C E 394M. Advanced Analyses in Geotechnical Engineering.**

Development and application of linear and nonlinear finite element procedures for solution of geotechnical engineering problems related to embankments, excavations, static soil-structure interaction, and seepage. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **C E 395P. Project Automation.**

Three lecture hours a week for one semester. Some topics may require additional hours; these are identified in the Course Schedule. May be

repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Advanced CAD Procedures.** Same as Architectural Engineering 395P (Topic 1: Advanced CAD Procedures). Introduction to advanced CAD procedures and CAD systems, and their influence on building design and construction. Nine hours of lecture and laboratory a week for one semester. Additional prerequisite: An introductory CAD course.

**Topic 2: Introduction to Construction Automation and Integration.** Same as Architectural Engineering 395P (Topic 2: Introduction to Construction Automation and Integration). Construction automation and integration activities, methods for opportunity identification and financial analysis of systems, and tools from several disciplines that are used in construction automation and integration; students prepare a project that synthesizes this information.

**Topic 3: Design of Automated Construction Systems.** The elements of construction systems, including mechanisms, sensors, and control; systems design methods and concerns. Students develop an individual design project.

**Topic 4: Sensing in Civil Engineering.** Sensor types and properties, data acquisition, sensor data analysis, sensor fusion, and classes of civil engineering applications. Students are encouraged to work on projects related to their research areas.

### **C E 395Q. Project Controls.**

Three lecture hours a week for one semester. Some topics require two lecture hours and three laboratory hours a week; these are identified in the Course Schedule. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Project Controls.** Fundamentals of planning, scheduling, and cost management on projects. Topics include network scheduling, activity and resource management, cost loading and cost control, and computer tools used for project controls, such as schedule simulation and three-dimensional and four-dimensional CAD.

**Topic 2: Project Production Systems.** Advanced topics in project controls, including supply chain management, procurement, interorganizational controls and incentives, process modeling, and simulation.

**Topic 5: Financial Management for Engineering and Construction Firms.** Introduction to financial, managerial, and tax accounting concepts, as well as corporate finance and strategy as they relate to engineering and construction firms. Emphasis is on content, interpretation, and uses of various accounting reports and financial statements in general, as well as those specific to engineering and construction industries. Topics include determination and reporting of net income methods and financial position unique to engineering and construction firms, and theories underlying business financial statements, as well as the consideration of managerial accounting and financial management topics that cover the planning and controlling of business operations and how financial management impacts a company's overall business success. Civil Engineering 395Q (Topic 5) and 397 (Topic: Financial Management for Engineering and Construction Firms) may not both be counted.

### **C E 395R. Project Information Systems.**

Three lecture hours a week for one semester; some topics require additional hours. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 2: Project Information Management Systems.** Information systems design and management concepts and their implementation in construction projects. Data acquisition, transmission, and storage; database management systems and information systems design.

**Topic 3: Decision and Risk Analysis.** Fundamentals of decision analysis and risk assessment; construction engineering/project management applications in decision analysis; methods of risk management; overview of project insurance.

**Topic 4: Metrics.** Measurement systems and benchmarking approaches for many aspects of construction projects. Included are measurement systems for design effectiveness, construction productivity, safety, cost and schedule controls, and overall industry statistics.

**Topic 5: Data Mining.** Same as Architectural Engineering 395R (Topic 5: Data Mining). Fundamentals of data mining. Techniques for data classification, prediction, clustering, and association rules mining. Data mining as an advanced data analysis method in engineering and construction. Implementation issues.

**Topic 6: Quantitative Methods for Project Analysis.** Practical methods of data analysis for evaluating project performance metrics. Includes quantitative methods for solving everyday problems such as bid selection, capital budgeting, assignment of resources, equipment replacement analysis, and the optimization of capital structure. Techniques for developing models under conditions of risk using Microsoft Excel and add-ins such as At Risk. Civil Engineering 395R (Topic 6) and 397 (Topic: Quantitative Methods for Project Analysis) may not both be counted.

**Topic 7: Building Information Modeling for Capital Projects.** Building information models in plan execution for a building construction project. Focus on implementation of building information modeling concepts throughout the lifecycle of a building, from planning and design to construction and operations. Civil Engineering 395R (Topic 7) and 397 (Topic: Building Information Modeling for Capital Projects) may not both be counted.

### **C E 395S. Project Organization.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Human Resources Project Management.** Evaluation of individual, group, and organizational behavior in construction work. In-depth study of communication, decision making, and the relationship between controls and behavior.

**Topic 2: Construction Productivity.** Construction productivity improvement by group field studies. In-depth study of the way overtime, changes, weather, and staffing levels influence productivity. Industrial engineering techniques are applied to the construction environment to improve the use of equipment and human and material resources.

**Topic 4: Project Management.** Same as Architectural Engineering 395S (Topic 4: Project Management). Overall aspects of project and portfolio management from inception to successful operation: project selection and feasibility, contracting methods, project scheduling, cost control systems, project communications, project scope and quality management, human resource management, partner selection and management, project leadership, project closeout, and global project management.

### **C E 395T. Project Technology.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 3: Heavy Civil Construction.** Methods and materials in heavy civil construction; earthwork, concrete, structural steel, and deep foundations; equipment selection, configuration, productivity, and safety issues; site and craft planning, environmental issues, and optimization modeling; and field studies.

**Topic 6: Value Management Processes I.** Industry value management processes, including value engineering and life cycle costing, process simplification, function analysis concept development, design to capacity, constructability, modularization and preassembly, and design effectiveness.

**Topic 7: Value Management Processes II.** Industry value management processes, including mechanical reliability modeling, predictive maintenance, design for maintainability, waste minimization and pollution prevention, sustainable design and construction, planning for startup, lean construction, postoccupancy evaluation, and knowledge management and lessons learned systems.

**Topic 8: Industrial Construction.** Methods and materials in industrial construction; heavy lifts, mechanical equipment, process piping, electrical, and instrumentation work; equipment selection, configuration, productivity, and safety issues; preassembly, modularization, and work planning in the industrial environment; and field studies.

### **C E 395U. General Topics in Construction Engineering and Project Management.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Front-End and Contractor Planning.** Principles and applications of advanced project planning techniques for capital facility owners and contractors. Effective owner front-end planning of capital facilities, including team alignment, and preproject planning processes and tools. Contractor preconstruction planning, including team selection, scope and budget review, procurement, strategic sequencing, and planning assessment tools.

**Topic 3: Advanced Legal Concepts.** Same as Architectural Engineering 395U (Topic 3: Advanced Legal Concepts). Contracts, documentation requirements, claims avoidance, and settlement of claims by alternative dispute resolution. Students conduct and present in-depth studies of the most frequent causes of claims (delay, disruption, acceleration, soil conditions, and changes) and consider the way the court establishes causation and determines damages.

**Topic 4: Construction Safety.** Causes and effects of construction safety incidents, proactive preventative strategies, and tactics. Civil Engineering 395U (Topic 4) and 397 (Topic: Construction Safety Management) may not both be counted.

### **C E 395V. Seminar/Conference Course in Construction Engineering and Project Management.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Doctoral Research Methods Seminar.** Construction research methods seminar, including concepts and practice of research in construction engineering and management. Research methodologies and steps in the research process, including review and framing research questions. Students develop and critique a research proposal.

**Topic 2: Conference Course.**

**Topic 3: Construction Industry Seminar.** Construction industry issues and best practices, such as front-end planning and zero accident techniques, developed by the Construction Industry Institute (CII). Guest lecturers include CII management staff and visiting industry leaders. Emphasis on implementation of proven practices on projects.

### **C E 396L. Air Resources Engineering.**

Sources, transport, fate, impacts, characteristics, and control of air contaminants; source control and prevention; urban air quality;

occupational and residential indoor air quality. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Air Pollution Chemistry.** Classification, transport, transformation, deposition, sampling, and analysis of particulate and gaseous air pollutants in urban, regional, and global-scale systems. Emphasis on sustainable engineering.

**Topic 3: Air Pollution Control.** Design of air pollution control systems for stationary sources. Technical, regulatory, and economic fundamentals related to the control of gaseous and particulate emissions.

**Topic 4: Indoor Air Quality: Physics and Chemistry.** Sources, transport, and fate of indoor air pollutants. Interactions between indoor pollutants and indoor materials. Indoor air chemistry. Human exposure to pollutants in indoor environments.

**Topic 5: Atmospheric Transport and Dispersion Modeling.** Mathematical models of contaminant transport in the atmosphere; atmospheric turbulence and air pollution meteorology; Gaussian plume, gradient transport, and higher-order closure models; theoretical development and practical applications to engineering problems.

**Topic 6: Human Exposure to Indoor Air Pollution.** Human exposure to air pollution in the built environment, including the effects of sustainable building design on human exposure to toxic air pollutants. Subjects may include inhalation intake fractions for risk calculations and comparisons of sources of air pollution, transmission of airborne infectious disease, pharmacokinetic modeling, and case studies involving several important air pollutants. Civil Engineering 396L (Topic 6) and 397 (Topic: Human Exposure to Toxins) may not both be counted.

### **C E 396M. Advanced Topics in Atmospheric Science.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in a natural science or engineering.

**Topic 1: General Topics.**

**Topic 2: Air Pollution Meteorology.** Basic meteorology applied to air pollution; diffusion of conservative and nonconservative pollutants; plume rise; air pollution models.

### **C E 197, 297, 397. Special Studies in Civil Engineering.**

For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester; some topics require additional hours. With consent of instructor, any topic may be repeated for credit. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 4: Freight Transportation.** Topics include review of transport systems analysis; shipper objectives; demand and supply modeling; freight flow data; network analysis; truck size and weight policies; finance.

**Topic 6: Traffic Science Seminar.** Topics range from fundamentals of vehicular traffic science to relevant methodologies in physics, applied mathematics, and operational science.

**Topic 14: Design of Wood Members and Systems.** Design and behavior of solid wood and glued-laminated wood structural members; light-frame and heavy timber systems, including trusses and arches.

**Topic 15: Facilitating Process Improvement.** Civil Engineering X97 (Topic 15) is same as Management 285 (Topic 43).

**Topic 16: Evaluation, Materials, and Techniques for Concrete Repair.** Causes of distress, evaluation methods, repair materials, repair techniques, and quality control methods for repair of concrete. Three lecture hours a week for one semester, with one and one-half additional hours a week for guest speakers.

**Topic 17: Air Sampling and Analysis.** Collection and analysis of air samples for gaseous and particulate contaminants. Gas flow rate and calibration techniques, stationary source sampling and analysis, indoor air sampling, ozone and NO<sub>x</sub> ambient air monitoring.

**Topic 20: Computer Methods for Civil Engineers.** Essential methods for computer-aided problem solving in transportation and other civil engineering areas. Topics may include computer operating systems concepts; the Internet and World Wide Web site design; advanced programming with C programming language; data structures; file manipulation and management; Monte Carlo simulation techniques; interfacing with spreadsheets, SQL databases, and computer-aided design packages; introduction to Geographic Information Systems. Team programming is emphasized.

**Topic 22: Intelligent Transportation Systems Seminar.** Introduction to Intelligent Transportation Systems (ITS) concepts, evolution, and current initiatives. Program evolution from Mobility 2000, through IVHS and strategic planning activities by the Department of Transportation and ITS America, to current operational tests and deployment projects.

**Topic 32: Hydrodynamics of Propulsors and Dynamic Positioning Systems.** Hydrofoil and lifting surface theory, actuator disk and lifting line theory, vortex-lattice and panel methods, blade design techniques, propulsor-inflow and propulsor-hull interaction, unsteady blade and shaft forces, and modeling of sheet cavitation.

**Topic 35: Introduction to Structural Mechanics.** Discussion of force and stress, vectors and tensors; equilibrium; displacement and deformation; compatibility; constitutive equations, with examples from linear elasticity, linear viscoelasticity, and plasticity; principle of virtual work; elastic structures, principle of minimum potential energy, reciprocity theorem; critical equilibrium, stability; linear theories of beams, plates, and shells.

**Topic 50: Water Resources Development and Policies.** Analysis of water resources projects, particularly international water projects, with emphasis on engineering and planning considerations and their relation to governmental policies.

**Topic 54: Water Pollution Control.** The application and evaluation of new concepts in water pollution abatement and advanced water and wastewater treatment.

**Topic 56: Air Pollution Control.** Evaluation of new theoretical approaches to air pollution control.

**Topic 78: Design of Offshore Structures.** Selection of design storm; wave forces on structures; preliminary analysis of steel jacket platforms; joint design; fatigue considerations; foundation design; dynamic effects and responses.

#### **C E 197C, 297C, 397C, 697C. Master's Research.**

Independent research. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of adviser.

#### **C E 197D, 297D, 397D, 697D. Dissertation Research.**

Independent research. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of adviser.

#### **C E 397F. Forensic Engineering: Materials and Structures.**

Same as Architectural Engineering 383 (Topic 4: Forensic Engineering: Materials and Structures). Methods of forensic analysis; role of the expert witness; methods of dispute resolution; case studies; term project. Two lecture hours a week for one semester, with three laboratory hours a week for presentation of case studies. Prerequisite: Graduate standing and consent of instructor.

#### **C E 397K. Stability of Structures.**

Stability as it relates to actual behavior and design; elastic and inelastic theories; evaluation of specifications; columns, beams, and frames. Three

lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### **C E 397L. Advanced Structural Metals.**

Elastic and inelastic design methods for steel members, connections, and structures; torsion of open and closed sections, welding, plate buckling, and column stability; bracing design. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Civil Engineering 335, and consent of instructor.

#### **C E 397N. Nondestructive Testing Techniques.**

Basic signal processing knowledge; introduction to wave propagation theory; nondestructive testing (NDT) principles and applications to steel structures; evaluation of concrete structures and foundations; NDT methods selection; emerging technologies. Three lecture hours a week for one semester. Civil Engineering 397N and 397 (Topic: Nondestructive Testing Techniques in Civil Engineering) may not both be counted. Prerequisite: Graduate standing.

#### **C E 197Q, 297Q, 397Q, 697Q. Special Independent Studies in Civil Engineering.**

Independent study. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of adviser.

#### **C E 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in civil engineering and consent of the graduate adviser; for 698B, Civil Engineering 698A.

#### **C E 398D. Departmental Report.**

Preparation of a report to fulfill the requirement for the master's degree under the departmental report option. Individual instruction. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in civil engineering and consent of the supervising professor and the graduate adviser.

#### **C E 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the Master of Science in Engineering degree under the Graduate School report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in civil engineering and consent of the supervising professor and the graduate adviser.

#### **C E 398T. Supervised Teaching in Civil Engineering.**

Special training in teaching methods and procedures for civil engineering courses, including laboratory courses; the development of new material and methods to update present courses. Three lecture hours a week for one semester. Prerequisite: Graduate standing in civil engineering and appointment as a teaching assistant.

#### **C E 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

#### **C E 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Civil Engineering 399R, 699R, or 999R.

## **Electrical and Computer Engineering**

*Master of Science in Engineering*



## For More Information

**Campus address:** UT Administration Building (UTA) 7.320, phone (512) 232-1458, fax (512) 471-3652; campus mail code: C0803

**Mailing address:** The University of Texas at Austin; Department of Electrical and Computer Engineering Graduate Program; 1616 Guadalupe Stop C0803, Austin TX 78701-1204

**E-mail:** [ecegrad@ece.utexas.edu](mailto:ecegrad@ece.utexas.edu)

**URL:** <http://www.ece.utexas.edu/graduate>

## Objective

The objective of the faculty of the Department of Electrical and Computer Engineering and its Graduate Studies Committee is to provide a graduate program that is both broad and deep, covering the diverse technical areas within electrical and computer engineering. Nine academic tracks within the program support this objective: biomedical engineering; communications, networks, and systems; computer architecture and embedded processors; electromagnetics and acoustics; energy systems; integrated circuits and systems; plasma/quantum electronics and optics; software engineering; and solid-state electronics. In each academic track, a program of study can be designed to meet the educational objectives of each student.

## Facilities for Graduate Work

Facilities are available for graduate work in almost all specialties of electrical and computer engineering, from experimental, theoretical, and computational perspectives. Graduate activities of the department are currently housed in the UT Administration Building (to be moved to the new Engineering Education and Research Center, set to open fall 2017) and in several special-purpose facilities located in the Peter O'Donnell Jr. building and on the J. J. Pickle Research Campus.

Faculty of the Department of Electrical and Computer Engineering participate in the following nationally-recognized centers for multidisciplinary research: the Center for Advanced Research in Software Engineering, the Center for Electromechanics, the Center for Identity, the Center for Perceptual Systems, the Center for Transportation Research, the Computer Engineering Research Center, the Microelectronics Research Center, the Texas Materials Institute, and the Wireless Networking and Communications Group. Numerous facilities for experimental research are provided by the well-equipped research laboratories within the department. The University of Texas Libraries provide a rich source of literature to support graduate activities in electrical and computer engineering.

## Areas of Study

Graduate courses and research are offered with varying degrees of specialization in the following academic tracks. Topics of specialization within each track reflect the research interests of the faculty.

**Biomedical engineering.** The research of this faculty is focused in the following areas: biomedical instrumentation (primarily cardiovascular measurements, including clinical applications of admittance volume measurement), very-large-scale integration biomedical circuits (biosensors, lab-on-a-chip, and handheld MRI), bioelectromagnets (RF surgery, electromagnetic field exposure, and quantitative assessment of thermal damage processes), image and signal processing (feature extraction and diagnostic interpretation), machine learning, and health

information technologies (data mining and electronic medical records archiving and analysis).

**Communications, networks, and systems.** This track involves research and design in the following fields: (1) Communications and networking: all aspects of transmission of data, including: wireless communications, communication theory, information theory, networking, queueing theory, stochastic processes, sensor networks; (2) Data science and machine learning: all aspects of extraction of knowledge from data, including: algorithms, data mining, optimization, statistics, pattern recognition, predictive analytics, artificial intelligence; and (3) Controls, signals, and systems: estimation and detection; signal, image and video processing; linear and nonlinear systems.

**Computer architecture and embedded processors.** Computer architecture is at the interface of computer hardware and software. Its practitioners are responsible for specifying, designing, and implementing at the architecture level the hardware structures that carry out the work specified by computer software. Computer architects share the responsibility for providing mechanisms that algorithms, compilers, and operating systems can use to enhance the performance and/or energy requirements of running applications. Computer architecture spans many dimensions, such as the scope of a processor (embedded processors, desktop systems, servers, and supercomputers); the target application (general-purpose versus domain-specific); the characteristics of the design objectives (speed, power consumption, cost, reliability, availability, and reconfigurability); and the measurement and analysis of resulting designs.

**Electromagnetics and acoustics.** This track includes the study of electromagnetic and acoustic phenomena ranging from ultralow frequencies to the visible spectrum. The activities in electromagnetics involve research in antenna design, radar scattering, computational methods, wave-matter interaction, bioelectromagnetics, wave manipulation using artificial materials, wireless propagation channels, microwave and millimeter-wave integrated circuits, guided wave devices and systems, electromagnetic forces (including electrostrictive and magnetostrictive forces), and Maxwell's stress tensor. The activities in acoustics involve research in transducers, microelectromechanical systems, atmospheric and underwater acoustics, and noise and vibration control.

**Energy systems.** This track involves research in the production, distribution, conversion, and use of electric energy. Present investigations are concerned with renewable and alternative energy, advanced electrical machines, power system-related analyses, simulation of power systems, energy system economics and optimization, open-access transmission, electricity markets, energy efficiency and demand-side management, power system harmonics, power quality, distributed generation, power electronics, electromagnetic levitation, intelligent machines and drives for robotics and control, and electromechanical devices for pulsed power applications.

**Integrated circuits and systems.** This track involves all aspects of analysis, design, synthesis, and implementation of digital, analog, mixed-signal, and radio frequency (RF) integrated circuits and systems for applications in computing, sensing, and communications. Research in the area spans levels of abstraction from devices to systems-on-chip (SoC), and involves transceiver architectures, data converters, signal processing systems, integrated bio-chips, high-performance and low-power design, fault tolerance, design for manufacturability (DFM), design for test (DFT), verification, and computer-aided design (CAD).

**Plasma/quantum electronics and optics.** This track involves research in plasma dynamics, optics, quantum-optic and photonic devices, and plasma processing of semiconductors. Plasma investigations include the design of plasma diagnostics, high-order spectral analysis of plasma

waves, and plasma-enhanced chemical vapor deposition. Research in quantum electronics includes optical systems, lasers and laser applications, optical signal processing, optoelectronic devices, and lightwave systems. Investigations include quantum transport studies of double barrier heterostructures, components for very-high-speed communications and computation, high-energy laser applications in materials synthesis and processing, nanophotonic devices and materials, and plasmonics.

**Software engineering.** This track involves all aspects of engineering software systems. In addition to the problem of requirements, research and study in the area addresses architecting, designing, building, testing, analyzing, evaluating, deploying, maintaining, and evolving software systems. Problems investigated include theory, techniques, methods, processes, tools, middleware, and environments for all types of software systems in all types of domains and applications. This area of study is also available through the alternatively scheduled program in software engineering to professionals who are working full time.

**Solid-state electronics.** This track focuses on the development and improvement of micro- and nanoelectronic, optoelectronic, and electromechanical devices, and associated materials for a variety of applications. Devices include nanoscale and nontraditional complementary metal-oxide-semiconductor (CMOS) transistors, and beyond CMOS transistors; photodetectors, photodiodes and lasers, solar cells, and nanostructure optical metamaterials; and electronic and microelectromechanical sensors and actuators, including chemical and biological sensors. Material systems include unstrained and strained conventional column IV and III-V semiconductors; organics and polymers; novel materials such as graphene and topological insulators; and insulators such as silicon dioxide and high and low dielectric permittivity materials; along with their thin films and heterostructures.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Jacob A Abraham  
Deji Akinwande  
Andrea Alu  
Jeffrey G Andrews  
Aristotle Arapostathis  
Adnan Aziz  
Francois Baccelli  
Chandrajit L Bajaj  
Ross Baldick  
Sanjay K Banerjee  
Seth R Bank  
Suzanne Barber  
Don S Batory  
Michael F Becker  
Mikhail A Belkin  
Adela Ben-Yakar  
Alan C Bovik  
Constantine Caramanis  
Craig M Chase  
Ray T Chen  
Derek Chiou  
Gustavo A De Veciana  
Inderjit S Dhillon  
Georgios-Alex Dimakis  
Ananth Dodabalapur  
Andrew K Dunn  
Stanislav Emelianov  
Mattan Erez  
Brian L Evans  
Donald S Fussell  
Vijay K Garg  
Andreas M Gerstlauer  
Ranjit Gharpurey  
Joydeep Ghosh  
John B Goodenough  
Kristen L Grauman  
Neal A Hall  
Gary A Hallock  
Mark F Hamilton  
Robert W Heath Jr  
Paul S Ho  
Todd E Humphreys  
Warren A Hunt Jr

Vijay Janapa Reddi  
Lizy K John  
Christine L Julien  
Sarfraz Khurshid  
Jack C Lee  
Calvin Lin  
Hao Ling  
Nanshu Lu  
Mia K Markey  
Robert M Metcalfe  
Thomas E Milner  
Dean P Neikirk  
Evdokia Nikolova  
Michael E Orshansky  
Zhigang Pan  
Yale N Patt  
John A Pearce  
Dewayne E Perry  
Keshav K Pingali  
Leonard F Register  
Henry G Rylander III  
Sujay Sanghavi  
Surya Santoso  
Sanjay Shakkottai  
S V Sreenivasan  
Peter H Stone  
Nan Sun  
Earl E Swartzlander Jr  
Ahmed Hossam Tewfik  
Mohit Tiwari  
Nur A Toubia  
James W Tunnell  
Emanuel Tutuc  
Jonathan W Valvano  
Haris Vikalo  
Sriram Vishwanath  
T R Viswanathan  
Zheng Wang  
Preston S Wilson  
Emmett Witchel  
Ali E Yilmaz  
Edward T Yu

## Admission Requirements

To be admitted to the graduate program of the Department of Electrical and Computer Engineering, a student should normally have an undergraduate degree in this field. A student with a degree in another field may be admitted if his or her background is appropriate for the chosen academic track of specialization; however, the academic track adviser or supervising professor may require the student to complete additional coursework to address any academic deficiencies. Standards for entrance into the program generally exceed the minimum standards established by the University.

Graduate students in the Department of Electrical and Computer Engineering are expected to be proficient in English. Any student who does not meet the proficiency standards of the University may be required to complete a three-semester-hour English course. The course is counted toward the student's course load for the semester but is not counted toward the fulfillment of course requirements for the graduate degree.

# Degree Requirements

Entering students are admitted to pursue the Master of Science in Engineering only, the Master of Science in Engineering followed by the Doctor of Philosophy, or the Doctor of Philosophy only. A master's degree may be obtained with thesis, with report, or without thesis or report (coursework only). Pursuit of all degrees and options except for the master's without thesis or report requires the student to find a willing supervising professor; the master's without thesis or report can be overseen by the student's academic track adviser alone. The supervising professor, or a willing co-supervising professor, must be a member of the Electrical and Computer Engineering Graduate Studies Committee. More information about course loads, course selection, degree requirements, funding, and related matters is available from the Graduate Advising Office of the Department of Electrical and Computer Engineering.

## Master of Science in Engineering

**Traditional MSE Program.** The traditional Master of Science in Engineering (MSE) program offers three options for obtaining the MSE degree: with thesis, with report, and without thesis or report. All three options require a Program of Work consisting of thirty semester hours of coursework (ten courses), with no less than twenty-four hours (eight courses) of that being graduate-level coursework. Two (three-hour-minimum) upper-division undergraduate courses not taken for preparatory reasons nor required of undergraduates may be counted toward the required degree hours. The thesis option requires original research and satisfactory completion of a written thesis and two associated three-hour thesis courses taken on the credit/no credit basis within the thirty-hour total. The report option requires satisfactory completion of a written report and one associated three-hour report course taken on the credit/no credit basis within the thirty-hour total. Otherwise, all courses that count toward the Program of Work must be regular classroom instruction courses taken for a letter grade. Students may count only one course with a letter grade less than B-, and no course with a letter grade less than C toward the Program of Work.

The master's Program of Work is divided into major work and supporting work. At least eighteen hours must be in the major area including the thesis or report courses. At least six hours must be in supporting work, including at least one three-hour graduate level course. Major work can include coursework associated with the student's academic track, as well as closely-related coursework associated with other academic tracks within the department and from other departments. Supporting work can include coursework from other departments and coursework associated with other academic tracks within the department. The track advisers and/or the student's supervisor can provide guidance regarding which courses may be counted toward major or supporting work. A minimum grade point average of 3.00 is required in the major coursework and, separately, in the supporting coursework within the Program of Work.

Individual academic tracks may have additional requirements to those described above. Ultimately, all major and supporting coursework must be logically related, and the student's master's Program of Work must be approved by the student's academic track adviser and/or supervising professor, the graduate adviser of the Department of Electrical and Computer Engineering, and the Graduate School of the University of Texas at Austin. Specific regulations regarding the master's degree program are available from the appropriate academic track adviser and the Graduate Advising Office of the Department of Electrical and Computer Engineering.

**Integrated BSEE/MSE program.** Admission to the integrated Bachelor of Science in Electrical Engineering and Master of Science in Engineering (BSEE/MSE) program is open only to undergraduate students within the Department of Electrical and Computer Engineering at the University of

Texas at Austin. It results in the simultaneous awarding of a BSEE degree (integrated option) and an MSE degree. The MSE degree requirements for students in the integrated program are identical to those for students in the traditional MSE program. Final admission requirements and procedures are also much the same, except that the requirements for an undergraduate degree upon entering the program and for taking the Graduate Record Examination (GRE) have been waived by the University.

See the Bachelor of Science in Electrical Engineering (<http://catalog.utexas.edu/undergraduate/engineering/degrees-and-programs/bs-electrical-engineering/#integratedbseemseprogram>), integrated BSEE/MSE program section of the Undergraduate Catalog for more details about the requirements of the Integrated Option BSEE degree. Additional information about the integrated program requirements and policies may be obtained from the Electrical and Computer Engineering advising offices.

### Alternatively scheduled MSE program in software engineering.

The Department of Electrical and Computer Engineering also offers a terminal MSE degree with a concentration in software engineering through the Cockrell School of Engineering's Center for Lifelong Engineering Education (<http://lifelong.engr.utexas.edu/pme/swe.cfm>) (an option III degree program). Designed with full-time engineers and computer professionals in mind, this program is an alternative to the department's traditional master's program. Students admitted to this program are held to the same standards of performance as those in the traditional program. They attend classes taught by faculty from the Department of Electrical and Computer Engineering once a month on Fridays and Saturdays for two full academic years. A minimum grade point average of 3.00 is required in the major coursework and, separately, in the supporting coursework within the Program of Work. The degree requires satisfactory completion of a written report and one associated three-hour report course taken on the credit/no credit basis, and twenty-seven hours of graduate coursework taken on the letter-grade basis within the Program of Work. This program and the traditional graduate program are separate; students can only register for courses offered by their program of admission. Additional information about this program is published by the Center for Lifelong Engineering Education (<http://lifelong.engr.utexas.edu/pme/swe.cfm>).

**Professional MSE program.** The Department of Electrical and Computer Engineering also offers a primarily online professional program designed for individuals who wish to pursue a terminal MSE degree (also an option III degree program). A pilot program begins in the fall semester of 2016. Applications will be accepted for the fall semester of 2017. The program is administered by the Cockrell School of Engineering's Center for Lifelong Engineering Education (<http://lifelong.engr.utexas.edu/pme/swe.cfm>), which will publish additional information. The core objective of the professional MSE program in electrical and computer engineering is to provide students with the tools, skills, and knowledge needed to advance into leadership positions in industry with greater responsibility and impact. The professional master's degree program seeks applicants who are BSEE degree-holders with very strong technical backgrounds and some industry experience, although some applicants already may have the required qualities and experience upon completion of their bachelor's degrees.

Just as the traditional MSE program does, the professional MSE program offers three options: with thesis, with report, and without thesis or report. All three options also require a program of work consisting of thirty semester hours of coursework (ten courses). Students in the professional MSE program also are held to the same standards of performance as those in the traditional program.

The professional MSE program differs from the traditional MSE in that students may complete 100% of their coursework online. At least 80% of

the coursework must be selected from courses offered online. Moreover, among these online courses, students must take two courses that have been designed specifically for the professional MSE program. To improve the cohort's cohesiveness, provide exposure to CEOs and thought leaders, and assure true face-to-face interaction between students and faculty, these two courses are taken in the same semester and require students to come to campus for one week that semester. Otherwise, the courses offered online are selected each semester from those offered in the traditional program, vary from semester to semester, and mix the students from the traditional and professional programs in the same classes (albeit virtually in the case of the professional program students). All of the courses offered online are recorded and delivered online in both synchronous and asynchronous formats that support online collaborations. However, not all courses offered in the traditional program can or will be offered in the professional program. Additional information about this program is published by the Center for Lifelong Engineering Education (<http://lifelong.engr.utexas.edu/pme/swe.cfm>).

## Doctor of Philosophy

The PhD Program of Work consists of at least thirty hours of graduate-level coursework (ten courses) taken on the letter-grade basis, including appropriate coursework taken toward a master's degree at the University of Texas at Austin or, with approval, elsewhere. At least twelve hours (four courses) of those thirty must be taken in residence at the University of Texas at Austin. (Note that, although typical, having a master's degree is not required to earn a PhD.) Coursework is divided into major and supporting work, with no less than six hours (two courses) of supporting work. A minimum grade point average of 3.50 is required in the major coursework and, separately, in the supporting coursework within the Program of Work, with no course grade of less than a *B-* counted. Coursework beyond that required for the Program of Work consists of the dissertation courses and, more than likely, research problems courses. Individual academic tracks may have additional requirements.

The PhD is primarily a research-based degree beyond the requirements for a master's degree. Formal entry into the doctoral program is achieved when the student is admitted to candidacy for the PhD. The prospective candidate must find a willing supervising professor, and the supervising professor or a willing co-supervising professor must be a member of the Electrical and Computer Engineering Graduate Studies Committee. The Electrical and Computer Engineering Graduate Studies Committee considers the student's admission to candidacy upon completion of at least one full semester in residence, based on the student's performance on a doctoral qualifying examination and after a thorough review of the student's Program of Work. The qualifying examination consists of a written and oral proposal to the student's PhD qualifying examination committee. Many academic tracks also require the student to pass a pre-qualifying examination procedure prior to the qualifying examination. A detailed description of the procedure for admission to candidacy is available from the PhD coordinator of the student's academic track and the Graduate Advising Office of the Department of Electrical and Computer Engineering. The doctoral program typically requires five to seven years of work beyond the bachelor's degree.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2013–2014 and 2014–2015; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## Electrical Engineering: E E

### E E 380K. Introduction to System Theory.

Introduction to linear dynamical systems and differential equations, state space analysis and applications to feedback control, functional analytic methods, realization theory, stability theory, and elements of optimal control. Three lecture hours a week for one semester. Prerequisite: Graduate standing and credit or registration for Mathematics 365C.

### E E 380L. Computer Systems in Engineering.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 5: Engineering Programming Languages.** Higher-level languages for engineering design and problem solving; object-oriented programming in C++ and Unix systems programming.

**Topic 6: Real-Time Operating Systems.** Embedded microcomputer systems; implementation of multitasking, synchronization, protection, and paging; operating systems for embedded microcomputers; design, optimization, evaluation, and simulation of digital and analog interfaces; real-time microcomputer software; and applications, including data acquisition and robotics. Three lecture hours a week for one semester, with additional hours to be arranged. Additional prerequisite: Consent of instructor.

**Topic 7: Introduction to Pattern Recognition and Computer Vision.** Pattern recognition topics, including Bayesian decision theory, maximum likelihood and estimation, nonparametric techniques, and linear discriminant functions. Computer vision topics, including geometric camera models and calibration, geometry of multiple views and stereopsis, structure from motion, and tracking. Emphasis varies each semester.

**Topic 8: Computer Vision Systems.** Discussion of current research results and exploration of new directions in computer vision systems. Includes linear discriminant functions, nonmetric methods, unsupervised learning and clustering, model-based vision, segmentation using probabilistic methods, and content-based image and video analysis. Application of the techniques to real-world vision systems. Emphasis varies each semester.

**Topic 9: Artificial Neural Systems.** Feed-forward networks, distributed associative memory, recurrent networks, self-organization, parallel implementation, and applications.

**Topic 10: Data Mining.** Analyzing large data sets for interesting and useful information. Includes online analytical processing, finding association rules, clustering, classification, and function approximations. Scalability of algorithms and real-life applications.

**Topic 11: Mining the Web.** Analysis of data and information available from the World Wide Web. Exploiting the hyperlink structure of the Web for developing better search engines. Content analysis, information retrieval, clustering, and hierarchical categorization of Web documents. Web usage mining. Collaborative filtering and personalizing the Web. Additional prerequisite: Electrical Engineering 380L (Topic 10: Data Mining) or Computer Science 391L.

### E E 380N. Topics in System Theory.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and Electrical Engineering 380K.

**Topic 1: Nonlinear Systems: Input-Output Properties.**

**Topic 2: Nonlinear Systems: Geometric Theory.**

**Topic 3: Adaptive Control Systems.**

**Topic 4: Learning Systems and Cybernetic Machines.**

**Topic 5: Stochastic Control Theory.** Dynamic programming in finite and infinite horizon, models with imperfect state information, ergodic control problems, adaptive and risk-sensitive control. Additional prerequisite: Electrical Engineering 381J.

**Topic 7: Design of Computer-Controlled Systems.**

**Topic 8: Algorithms for Parallel and Distributed Computation.**

Computational and Applied Mathematics 380N and Electrical Engineering 380N (Topic 8) may not both be counted.

**Topic 9: Fundamentals of Robotics and Mechatronics.** Theory of robotics and mechatronics, with emphasis on control, sensing, actuation, low- and high-level vision. Introduction to manipulator geometry, kinematics, dynamics, and planning of trajectories. Robotics laboratory.

**Topic 10: Robotics II.**

**Topic 11: Optimization in Engineering Systems.** Formulation and solution of continuous optimization problems in engineering design and operations.

### **E E 381J. Probability and Stochastic Processes I.**

Probability spaces, random variables, expectation, conditional expectation, stochastic convergence, characteristic functions, and limit theorems. Introduction to Markov and Gaussian processes, stationary processes, spectral representation, ergodicity, renewal processes, martingales, and applications to estimation, prediction, and queueing theory. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Electrical Engineering 351K or the equivalent.

### **E E 381K. Topics in Communication Theory and Signal Processing.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with topic.

**Topic 1: Detection Theory.**

**Topic 2: Digital Communications.** Characterization of communication signals and systems (bandpass signals and systems, signal space representation, digitally modulated signals, and spectral characteristics), optimum receivers for additive white Gaussian noise (correlation demodulator, matched-filter demodulator, performance for binary and M-ary modulation, and noncoherent receivers), error control codes (block and convolutional), and bandlimited channels (ISI and equalization). Additional prerequisite: Electrical Engineering 351K, 351M, and 360K.

**Topic 5: Advanced Telecommunication Networks.** Methods and research issues in the performance evaluation and management of high-speed and mobile communication networks. Additional prerequisite: Electrical Engineering 380N (Topic 11: Optimization in Engineering Systems), 381J, and 381K (Topic 13).

**Topic 6: Estimation Theory.**

**Topic 7: Information Theory.** Source and channel coding theorems, Kolmogorov complexity, network information theory, and connections with large deviations. Additional prerequisite: Electrical Engineering 371M.

**Topic 8: Digital Signal Processing.** Signals and systems; generalized functions; z-transforms; Fourier series and transforms; fast Fourier transform; sampling, quantization, and aliasing; digital filter design; discrete-time random processes; multirate processing; filter banks and subband decomposition; nonlinear digital filters. Additional prerequisite: Electrical Engineering 351K and 351M.

**Topic 9: Advanced Signal Processing.** Signal modeling; optimum filtering; spectral estimation; fast algorithms; and applications in array signal processing, speech coding, and digital communication. Additional prerequisite: Electrical Engineering 351K, 381K (Topic 8), and Mathematics 340L.

**Topic 11: Wireless Communications.** Introduction to fundamental aspects of wireless communication systems including channel modeling, diversity, multiple antenna transmission and reception, adaptive modulation; multiuser concepts including CDMA, OFDMA, and broadcast and MAC channels; system-level modeling including

network information theory, stochastic geometry and network interference models. Additional prerequisite: Electrical Engineering 381K (Topic 2), 471C, or 381K (Topic: Wireless Communications Lab), or consent of instructor.

**Topic 13: Analysis and Design of Communication Networks.**

Stochastic and deterministic traffic and queueing models. Techniques for call admission, routing, flow control, network optimization, estimation, and decision making in uncertain environments. Additional prerequisite: Electrical Engineering 381J and 381K (Topic 15) (or 382N (Topic 5: Communication Networks: Technology, Architectures, and Protocols)).

**Topic 14: Multidimensional Digital Signal Processing.**

Multidimensional signals and systems, multidimensional discrete Fourier analysis, discrete cosine transform, two-dimensional filters, beamforming, seismic processing, tomography, multidimensional multirate systems, image halftoning, and video processing. Additional prerequisite: Electrical Engineering 380K, 381K (Topic 8), or 383P (Topic 1: Fourier Optics).

**Topic 15: Communication Networks: Technology, Architectures, and Protocols.** Network services and techniques, layered architectures, circuit and packet-switching networks, internetworking, switch architectures, control mechanisms, and economic issues. Three lecture hours a week for one semester. Electrical Engineering 381K (Topic 15) and 382N (Topic 5) may not both be counted. Additional prerequisite: Consent of instructor.

**Topic 16: Digital Video.** Video sampling and transform; video (retinal and cortical) filters; motion detection and estimation; statistical models of videos; neuroscience of video perception; natural video statistics; modern video compression standards; video quality prediction; video denoising; active contour models; and video saliency. Electrical Engineering 381K (Topic 16) and 381V (Topic: Digital Video) may not both be counted.

**Topic 17: Wireless Communications Laboratory.** The fundamentals of wireless communication from a digital signal processing perspective; linear modulation, demodulation, and orthogonal frequency division multiplexing; synchronization, channel estimation, and equalization; communication in fading channels; principles of MIMO communication; and wireless standards. Three lecture hours a week for one semester, with additional hours to be arranged. Electrical Engineering 381K (Topic 17) and 381V (Topic: Wireless Communications Lab) may not both be counted. Additional prerequisite: Consent of instructor.

**Topic 18: Convex Optimization.** The fundamentals of convex optimization with a focus on modeling, computation and scale: convex sets and functions, unconstrained optimization via first and second-order methods, duality, constrained optimization, SDPs, stochastic and sub-gradient descent methods, ADMMs, and applications. Electrical Engineering 381K (Topic 18) and 381V (Topic: Large Scale Optimization) may not both be counted.

**Topic 19: Wireless Network Modeling and Performance**

**Evaluation.** Modeling of large wireless networks, random graphs, stochastic geometry, point processes, space and time averages, connectivity, stability, capacity, and network design optimization, with applications for cellular network, mobile ad hoc networks, device to device networks, and vehicular networks. Additional prerequisite: Consent of instructor.

### **E E 381L. Digital Time Series Analysis and Applications.**

Digital implementation of higher-order spectra and other techniques useful in analyzing, interpreting, and modeling random time series data from linear and nonlinear physical systems. Three lecture hours a week for one semester. Prerequisite: Graduate standing in engineering or natural sciences.

### **E E 381M. Probability and Stochastic Processes II.**

Random walk and Brownian motion; renewal and regenerative processes; Markov processes; ergodic theory; continuous parameter martingales; stochastic differential equations; diffusions; stochastic control; multidimensional stochastic models. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Electrical Engineering 381J.

### **E E 381S. Space-Time Communication.**

Multiple-input multiple-output (MIMO) wireless communication, including discrete-time signal models, equalization, and channel estimation; channel models; channel capacity; average probability of error in fading channels; channel coding; transmit and receive diversity; space-time codes; spatial multiplexing; precoding and limited feedback; space-time adaptation; multiuser communication; multiuser information theory; practical multiuser algorithms; and applications in recent standards. Three lecture hours a week for one semester. Electrical Engineering 381S and 381V (Topic: Advanced Wireless: Space-Time Communication) may not both be counted. Prerequisite: Graduate standing and Electrical Engineering 381J and 381K (Topic 2: Digital Communications).

### **E E 381V. New Topics in Communications, Networks, and Systems.**

Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **E E 382C. Topics in Software Engineering and Systems.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### **Topic 1: Engineering Design of Software and Software Systems.**

The software development process; selection and application of software design methods; evaluation of software designs.

**Topic 2: Creation and Maintenance of Distributed Software Systems.** Creation of large distributed software applications, with emphasis on specification, failure models, correctness, security.

**Topic 3: Verification and Validation of Software.** Evaluation of software for correctness, efficiency, performance, and reliability.

**Topic 4: Software/Hardware Engineering Project Management.** Requirements for a project management plan; role of the manager of the software development life cycle; economic and customer-driven factors.

**Topic 5: Large Software/Hardware/Communications Systems Engineering.** Techniques used to specify and design systems of software, hardware, and communications components. Creation of a requirements document and system specification.

**Topic 6: Software for Highly-Available Distributed Applications.**

**Topic 7: Software Architectures.** Software engineering approaches; scenario-based engineering processes to analyze problem domain; domain modeling and representations; creation of component-based reference architecture providing an object-oriented representation of system requirements.

**Topic 8: Methodologies for Hardware/Software Codesign.**

Techniques used to design complex hardware/software systems; emphasis on specification, modeling, estimation, partitioning, verification/validation, and synthesis.

**Topic 9: Embedded Software Systems.** Dataflow models, uniprocessor and multiprocessor scheduling, hardware/software codesign, hierarchical finite state machines, synchronous languages, reactive systems, synchronous/reactive languages, heterogeneous systems.

**Topic 10: Empirical Studies in Software Engineering.**

**Topic 11: Requirements Engineering.**

**Topic 12: Multicore Computing.** Theoretical and practical aspects of designing multicore software systems; programming constructs for concurrent computation, openMP, sequential consistency, linearizability, lock-based synchronization, lock-free synchronization, wait-free synchronization, consensus number, software transactional memory, testing and debugging parallel programs, race detection, concurrent data structures such as stacks, queues, linked lists, hash tables and skiplists, formal models, temporal logic, reachability analysis, and parallel graph algorithms. Electrical Engineering 382C (Topic 12) and 382V (Topic: Multicore Computing) may not both be counted.

### **E E 382L. Theory of Digital Systems.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Switching Theory.** General theory and realization algorithms for combinational, sequential, and array logic.

**Topic 2: Graph Theory and Applications.** Elementary graph theory concepts; graph theory algorithms and applications in multicomputer architecture, switching and coding theory, data structures, computer networks, programming, algorithm analysis, diagnosis and fault tolerance.

### **E E 382M. Design of Digital Systems.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: VLSI Testing.** Hardware and software reliability analysis of digital systems; testing, design for testability, self-diagnosis, fault-tolerant logic design, error-detecting and error-correcting codes.

**Topic 2: Dependable Computing.** Design techniques for reliable, fault-tolerant, fail-safe and fail-soft systems; fault diagnosis and fault avoidance methods at program and system levels; experimental and commercial fault-tolerant computer systems.

**Topic 7: VLSI I.** Very-large scale integration (VLSI) circuit design. CMOS technology; static and dynamic CMOS combinational and sequential circuits; design of datapath elements; performance, power consumption, and testing. Includes the use of CAD tools for layout, timing analysis, synthesis, physical design, and verification.

**Topic 8: VLSI II.** Microelectronic systems architecture; VLSI circuit testing methods; integration of heterogeneous computer-aided design tools; wafer scale integration; advanced high-speed circuit design and integration.

**Topic 9: Simulation Methods in CAD/VLSI.** Techniques and algorithms for simulating large-scale digital and analog circuits.

**Topic 10: Synthesis of Digital Systems.** Automatic generation of gate-level implementations from HDL specifications; optimization of two-level, multilevel, and sequential circuits for area, speed, and testability.

**Topic 11: Verification of Digital Systems.** Automatic verification of digital systems; formal models and specifications, equivalence checking, design verification, temporal logic, BDDs, logical foundations, automata theory, recent developments.

**Topic 13: Analysis and Design of Digital Integrated Circuits.** Device and circuit-level aspects of MOS digital integrated circuit design.

**Topic 14: Analog Integrated Circuit Design.** Analysis and design of analog integrated circuits; transistor models and integrated circuit technologies; layout techniques; noise; mismatches; current mirrors; differential amplifiers; frequency response and compensation; feedback and stability; nonlinear circuits; voltage references; and operational amplifiers using state-of-the-art CAD tools for design, simulation, and layout.

**Topic 16: Application-Specific Processing.** Techniques for the design and analysis of application-specific processors, including special purpose systems, embedded processors, and systems-on-chip.

**Topic 17: High-Level Synthesis of Digital Systems.** Synthesis from high-level languages (C) to RTL; allocation, scheduling and binding algorithms, and optimizations under area and performance objectives and constraints.

**Topic 19: Mixed-Signal System Design and Modeling.** Architecture development for mixed-signal integrated circuits. Modeling of analog and digital filters, data converters, and digital data receivers.

**Topic 20: System-on-Chip (SoC) Design.** Methodologies and tools for System-on-Chip (SoC) design, hardware/software co-design and co-verification; partitioning; real-time scheduling; hardware acceleration; high-level C-to-RTL synthesis; allocation, scheduling and binding algorithms for hardware synthesis; hardware/software interfacing; virtual prototyping and hardware/software co-simulation; FPGA prototyping of hardware/software systems. Electrical Engineering 382M (Topic 20) and 382V (Topic: System-on-a-Chip Design) may not both be counted.

**Topic 21: Advanced Issues in VLSI CAD and Optimizations.** Interconnect and gate modeling; timing analysis; interconnect topology optimization; gate sizing; buffer insertion and sizing; wire sizing and planning; crosstalk analysis and mitigation; clock network synthesis; interconnect planning; modern placement techniques; congestion mitigation; low power optimization; design for manufacturability and reliability; design and CAD for emerging technologies. Electrical Engineering 382M (Topic 21) and 382V (Topic: Optimization Issues in VLSI CAD) may not both be counted. Additional prerequisite: Consent of instructor.

**Topic 22: VLSI Physical Design Automation.** Algorithms and methodologies in circuit partitioning, floorplanning, global placement, detailed placement, global routing, detailed routing, clock tree routing, power/ground routing; also includes new trends in physical design. Electrical Engineering 382M (Topic 22) and 382V (Topic: VLSI Physical Design Automation) may not both be counted. Additional prerequisite: Consent of instructor.

**Topic 23: Low-Power and Robustness Design.** Nanometer transistors and models; design-time and runtime techniques for dynamic and standby power minimization; power minimization at circuit and architecture levels; power minimization for logic, memory, and interconnect; sources of variability; statistical data collection and analysis of variance; statistical circuit simulation and timing analysis; manufacturability and resolution enhancement techniques. Electrical Engineering 382M (Topic 23) and 382V (Topic: Nanometer Scale IC Design) may not both be counted. Additional prerequisite: Consent of instructor.

**Topic 24: Analog-Digital Data Conversion Circuits.** Analysis and design of analog-digital data conversion circuits including both architectural-level and transistor-level design considerations; design trade-offs among power, noise, linearity, and speed; sample-and-hold circuits and voltage comparators; noise analysis for mixed-signal circuits; flash, pipelined, successive approximation, and delta-sigma oversampling analog-to-digital-converters (ADCs); resistor-string, R-2R, current-steering, and delta-sigma oversampling digital-to-analog-converters (DACs); and the use of state-of-the-art CAD tools for analysis, design, and validation. Electrical Engineering 382M (Topic 24) and 382V (Topic: Data Converters) may not both be counted. Additional prerequisite: Consent of instructor.

**Topic 25: Radio Frequency Integrated Circuit Design.** Noise and distortion in devices and circuits; amplifier design techniques for low noise, variable gain, high output power, and high dynamic range; analysis and design of integrated mixers and other frequency converters; voltage and current mode mixers; rectifiers; integrated oscillators for generating fixed and variable frequencies; relevant performance metrics and trade-offs; noise in linear and non-linear

time varying circuits; circuit techniques for linearity enhancement; design optimization in bipolar and CMOS technologies; introduction to transceiver architectures. Electrical Engineering 382M (Topic 25) and 382V (Topic: Radio Frequency Integrated Circuit Design) may not both be counted. Additional prerequisite: Consent of instructor.

## **E E 382N. Computer Architecture and Embedded Processors.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Computer Architecture.** Characteristics of instruction set architecture and microarchitecture; physical and virtual memory; caches and cache design; interrupts and exceptions; integer and floating-point arithmetic; I/O processing; buses; pipelining, out-of-order execution, branch prediction, and other performance enhancements; design trade-offs; case studies of commercial microprocessors. Laboratory work includes completing the behavioral-level design of a microarchitecture. Three lecture hours and one and one-half laboratory/recitation hours a week for one semester.

**Topic 3: Interconnection Networks.** Topologies, routing algorithms, permutations, resource allocations, performance evaluation, fault tolerance, VLSI design, parallel/distributed algorithms, languages for specifying protocols, distributed operating systems.

**Topic 4: Advanced Embedded Microcontroller Systems.** Hardware and software design of microcontroller systems; applications, including communication systems; object-oriented and operating systems approaches to interfacing and resource management.

**Topic 10: Parallel Computer Architecture.** Study of parallel computing, including models, algorithms, languages, compilers, interconnection networks, and architectures.

**Topic 11: Distributed Systems.** Tracking dependency, mutex algorithms, snapshot algorithms, leader election, spanning tree, distributed algorithms, Map-Reduce, slicer, termination detection, message order, synchronizers, self-stabilization, knowledge, consensus, Byzantine agreement, fault-tolerance.

**Topic 14: High-Speed Computer Arithmetic I.** Design of computer arithmetic units: fast adders, fast multipliers, dividers, and floating-point arithmetic units.

**Topic 15: High-Speed Computer Arithmetic II.** Advanced topics in computer arithmetic, including error correcting coding, residue number systems, CORDIC arithmetic, and VLSI implementation. Additional prerequisite: Electrical Engineering 382N (Topic 14).

**Topic 16: Distributed Information System Security.**

**Topic 17: Superscalar Microprocessor Architectures.** Superscalar processor architectures; instruction level parallelism; machine level parallelism; superscalar organization; instruction windows; reservation station; register data flow; register renaming; reorder buffers; memory disambiguation; branch prediction; value prediction; instruction reuse techniques; comparison with very long instruction word (VLIW), single instruction-multiple data (SIMD), and multiple instruction-multiple data (MIMD) approaches; memory systems for superscalar processors; design for performance and power efficiency; performance evaluation of superscalar processors; and case studies.

**Topic 18: Distributed Systems II.**

**Topic 19: Microarchitecture.** Concepts in architecture and microarchitecture. Critical path, bread-and-butter design, partitioning, timing, and pipelining. Data path, state machine, microsequencer, microinstruction, microcode, microprogramming, and CAD tools; pipelining, branch prediction, and out-of-order execution. Trace cache, block-structured ISA, simultaneous multithreading, and clustering; single instruction-multiple data (SIMD), very long instruction word (VLIW), decoupled access/execute (DAE), high performance switch (HPS), and data flow. Impact of compiler technology, reduced instruction set computing (RISC), and predicated execution. Multiprocessor issues, cache coherency, memory consistency, and

graphics processing units (GPUs). IEEE Floating Point, and example state-of-the-art microarchitectures. Measurement methodology and abuses.

**Topic 20: Computer Architecture: Parallelism and Locality.**

Hardware and software parallelism and locality mechanisms, and their impact on processor performance, bandwidth, and power requirements; architectures and microarchitectures of throughput-oriented processors that rely on parallelism, locality, and hierarchical control; parallel memory systems; and streaming and bulk execution and programming models. Includes programming and measuring performance on massively parallel processors. Electrical Engineering 382N (Topic 20) and 382V (Topic: Principles of Computer Architecture) may not both be counted.

**Topic 21: Computer Performance Evaluation and Benchmarking.**

Performance analysis of microprocessors and computer architectures; impact of performance analysis on microprocessor design; techniques for analysis of architectural trade-offs; performance and power modeling; performance metrics; benchmarks, measurement tools, and techniques; simulation, challenges in full-system simulation; instruction profiling; trace generation; sampling; simulation points; analytical modeling; calibration of microprocessor performance models; workload characterization; benchmarks for emerging programming paradigms; synthetic benchmarks; statistical methods to compare alternatives; linear regression; and design of experiments. Electrical Engineering 382M (Topic 15) and 382N (Topic 21) may not both be counted. Additional prerequisite: Consent of instructor.

**Topic 22: Computer Architecture: User System Interplay.**

Fundamental principles in computer architecture focusing on the hardware and the compiler, as well as developing an understanding of their interplay with each other and with usage and programming models. Development of several system families and follow common threads of identifying the intended users, system properties, and evaluation methodology through structured lectures, paper reading, discussions, and a collaborative project. Case studies including PCs and workstations with general-purpose processors, large parallel systems, graphics processors, and more experimental architectures such as Stream Processing and transactional memory. Electrical Engineering 382N (Topic 22) and 382V (Topic: Computer Architecture--User System Interplay) may not both be counted. Additional prerequisite: Consent of instructor.

**Topic 23: Embedded System Design and Modeling.** Methods and techniques for formal specification, modeling, and system-level design of embedded systems; models of computation (MoCs) include concurrency, finite state machines (FSMs), process networks, and dataflow; system-level design languages (SLDLs) and methodologies; system-level synthesis such as algorithms for partitioning, scheduling, and design space exploration; system refinement; virtual platform modeling such as system simulation and transaction-level modeling (TLM); hardware and software synthesis; system-level design tools and case studies. Electrical Engineering 382N (Topic 23) and 382V (Topic: Embedded System Design and Modeling) may not both be counted.

**E E 382S. Topics in Integrated Circuits and Systems.**

Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**E E 382V. New Topics in Computer Engineering.**

Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Software Evolution.** Software design principles; program differencing techniques; program transformation languages and tools; analysis, testing, debugging and visualization methods for evolving

software. Electrical Engineering 382V (Software Evolution) and 382V (Topic 1) may not both be counted. Offered on the letter-grade basis only.

**E E 383L. Electromagnetic Field Theory.**

Vector space, Green's function; equivalence theorem; vector potentials; plane, cylindrical, and spherical waves; radiation and scattering. Three lecture hours a week for one semester. Prerequisite: Graduate standing in electrical engineering.

**E E 383M. Microwave Field Theory.**

Guided waves in cylindrical waveguides, microstrip lines, dielectric and optical waveguides; integrated circuits; periodic structures. Three lecture hours a week for one semester. Prerequisite: Graduate standing in electrical engineering.

**E E 383N. Theory of Electromagnetic Fields: Electrodynamics.**

Intermediate electromagnetic field theory, with emphasis on the interaction of fields and material media, including anisotropic media. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**E E 383P. Topics in Optical Processing and Laser Communications.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in engineering, mathematics, chemistry, or physics.

**Topic 1: Fourier Optics.** Fourier transforming properties of lenses, frequency analysis of optical imaging systems, spatial filtering, introduction to optical information processing and holography.

**Topic 3: Techniques of Laser Communications.** Optical propagation in crystalline media, harmonic generation, frequency conversion, and modulation systems.

**Topic 4: Fiber and Integrated Optics I.** Waveguiding in slabs, cylinders, and fibers. Optical fiber communications principles. Mode coupling. Guided-wave optical sources, modulators, and detectors.

**Topic 5: Fiber and Integrated Optics II.** Principles and practices of guided-wave optical sensor technology. Nonlinear optical effects in fibers, including amplification and fiber lasers.

**Topic 6: Semiconductor Optoelectronic Devices.** Semiconductor materials and nanomaterials growth. Light-matter interaction in bulk and nanostructures, including both band-to-band and intersubband transitions. Bandstructure in real-space and k-space. Photonic devices and their design: light-emitting diodes (LEDs), photodetectors, modulators, solar cells, and semiconductor lasers (diode and quantum cascade). Additional prerequisites: Electrical Engineering 325, 334K, and 339, or their equivalents.

**Topic 8: Optical Communications.** Concepts behind research and development in optical communications and optical interconnects. Device physics and system applications. Advanced technology solutions and innovative manufacturing processes to deliver optical passive and active micro- and nanodevices that enable the deployment of short-haul and metropolitan area all-optical networks for communications and for sensing networks. Additional prerequisites: Electrical Engineering 325 and 339, or their equivalent.

**E E 383V. New Topics in Electromagnetics.**

Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Nanophotonics.** The propagation of light in photonic crystals, plasmonic structures, and quantum dots; modified light-matter interaction at nanoscales, including emission, absorption, and



scattering; evanescent tunneling; temporal coupled-mode theory. Additional prerequisite: Electrical Engineering 325 and 334K, or their equivalents.

### **E E 384N. Acoustics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Acoustics I.** Same as Mechanical Engineering 384N (Topic 1: Acoustics). Plane waves in fluids; transient and steady-state reflection and transmission; lumped elements; refraction; strings, membranes, and rooms; horns; ray acoustics; absorption and dispersion.

**Topic 2: Acoustics II.** Same as Mechanical Engineering 384N (Topic 2: Acoustics II). Spherical and cylindrical waves, radiation and scattering, multipole expansions, Green's functions, waveguides, sound beams, Fourier acoustics, Kirchhoff theory of diffraction, and arrays.

**Topic 3: Electromechanical Transducers.** Same as Mechanical Engineering 384N (Topic 3: Electromechanical Transducers). Modeling, analysis, and design of transducers for reception and transmission of acoustic and vibration signals; dynamics of coupled electrical, mechanical, and acoustical systems; and the effects of transducer characteristics on fidelity and efficiency of transduction.

**Topic 4: Nonlinear Acoustics.** Same as Mechanical Engineering 384N (Topic 4: Nonlinear Acoustics). Waveform distortion and shock formation, harmonic generation and spectral interactions, effects of absorption and dispersion, parametric arrays, Rankine-Hugoniot relations, weak shock theory, numerical modeling, radiation pressure, and acoustic streaming.

**Topic 5: Underwater Acoustics.** Same as Mechanical Engineering 384N (Topic 5: Underwater Acoustics). Acoustical properties of the ocean; point sources and Green's functions; reflection phenomena; ray theory; normal mode theory; guided waves in horizontally stratified fluid media; WKB and parabolic approximations.

**Topic 6: Architectural Acoustics.** Same as Mechanical Engineering 384N (Topic 6: Architectural Acoustics). Human perception of sound, principles of room acoustics, sound-absorptive materials, transmission between rooms, and acoustical design of enclosed spaces.

**Topic 7: Ultrasonics.** Same as Mechanical Engineering 384N (Topic 7: Ultrasonics). Acoustic wave propagation in fluids, elastic solids, and tissue; transducers, arrays, and beamforming; nondestructive evaluation; and acoustical imaging.

### **E E 384V. Current Topics in Acoustics.**

Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **E E 385J. Topics in Biomedical Engineering.**

Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in engineering and consent of instructor.

**Topic 3: Bioelectric Phenomena.** Electrical Engineering X85J (Topic 3) is same as Biomedical Engineering 385J (Topic 3: Bioelectric Phenomena), Chemical Engineering 385J (Topic 3: Bioelectric Phenomena), and Mechanical Engineering 385J (Topic 3: Bioelectric Phenomena). Examines the physiological bases of bioelectricity and the techniques required to record bioelectric phenomena both intracellularly and extracellularly; the representation of bioelectric activity by equivalent dipoles and the volume conductor fields produced.

**Topic 9: Laser-Tissue Interaction: Thermal.** Electrical Engineering X85J (Topic 9) is same as Biomedical Engineering 385J (Topic 9:

Laser-Tissue Interaction: Thermal), Chemical Engineering 385J (Topic 9: Laser-Tissue Interaction: Thermal), and Mechanical Engineering 385J (Topic 9: Laser-Tissue Interaction: Thermal). The thermal response of random media in interaction with laser irradiation. Calculation of the rate of heat production caused by direct absorption of the laser light, thermal damage, and ablation.

**Topic 15: Biosignal Analysis.** Electrical Engineering X85J (Topic 15) is same as Biomedical Engineering 385J (Topic 15: Biosignal Analysis), Chemical Engineering 385J (Topic 15: Biosignal Analysis), and Mechanical Engineering 385J (Topic 15: Biosignal Analysis). Theory and classification of biological signals such as EEG, EKG, and EMG. Data acquisition and analysis procedures for biological signals, including computer applications.

**Topic 16: Laser-Tissue Interaction: Optical.** Electrical Engineering X85J (Topic 16) is same as Biomedical Engineering 385J (Topic 16: Laser-Tissue Interaction: Optical), Chemical Engineering 385J (Topic 16: Laser-Tissue Interaction: Optical), and Mechanical Engineering 385J (Topic 16: Laser-Tissue Interaction: Optical). The optical behavior of random media such as tissue in interaction with laser irradiation. Approximate transport equation methods to predict the absorption and scattering parameters of laser light inside tissue. Port-wine stain treatment; cancer treatment by photochemotherapy; and cardiovascular applications.

**Topic 17: Biomedical Instrumentation II: Real-Time Computer-Based Systems.** Electrical Engineering X85J (Topic 17) is same as Biomedical Engineering 385J (Topic 17: Computer-Based Biomedical Instrumentation), Chemical Engineering 385J (Topic 17: Computer-Based Biomedical Instrumentation), and Mechanical Engineering 385J (Topic 17: Computer-Based Biomedical Instrumentation). Design, testing, patient safety, electrical noise, biomedical measurement transducers, therapeutics, instrumentation electronics, microcomputer interfaces, and embedded systems. Four structured laboratories and an individual project laboratory.

**Topic 18: Biomedical Imaging: Signals and Systems.** Electrical Engineering X85J (Topic 18) is same as Biomedical Engineering 385J (Topic 18: Biomedical Image Processing), Chemical Engineering 385J (Topic 18: Biomedical Image Processing), and Mechanical Engineering 385J (Topic 18: Biomedical Image Processing). Physical principles and signal processing techniques used in thermographic, ultrasonic, and radiographic imaging, including image reconstruction from projections such as CT scanning, MRI, and millimeter wave determination of temperature profiles. Additional prerequisite: Electrical Engineering 371R.

**Topic 23: Optical Spectroscopy.** Electrical Engineering X85J (Topic 23) is same as Biomedical Engineering 385J (Topic 23: Optical Spectroscopy), Chemical Engineering 385J (Topic 23: Optical Spectroscopy), and Mechanical Engineering 385J (Topic 23: Optical Spectroscopy). Measurement and interpretation of spectra: steady-state and time-resolved absorption, fluorescence, phosphorescence, and Raman spectroscopy in the ultraviolet, visible, and infrared portions of the spectrum.

**Topic 26: Therapeutic Heating.** Engineering aspects of electromagnetic fields that have therapeutic applications: diathermy (short wave, microwave, and ultrasound), electrosurgery (thermal damage processes), stimulation of excitable tissue, and electrical safety.

**Topic 28: Noninvasive Optical Tomography.** Basic principles of optical tomographic imaging of biological materials for diagnostic or therapeutic applications. Optical-based tomographic imaging techniques including photothermal, photoacoustic, and coherent methodologies.

**Topic 31: Biomedical Instrumentation I.** Application of electrical engineering techniques to analysis and instrumentation in biological sciences: pressure, flow, temperature measurement; bioelectrical signals; pacemakers; ultrasonics; electrical safety; electrotherapeutics.

**Topic 32: Projects in Biomedical Engineering.** An in-depth examination of selected topics, such as optical and thermal properties of laser interaction with tissue; measurement of perfusion in the microvascular system; diagnostic imaging; interaction of living systems with electromagnetic fields; robotic surgical tools; ophthalmic instrumentation; noninvasive cardiovascular measurements. Three lecture hours and six laboratory hours a week for one semester. Additional prerequisite: Biomedical Engineering 384J (Topic 1) or Electrical Engineering 385J (Topic 31).

**Topic 33: Neurophysiology/Prosthesis Design.** The structure and function of the human brain. Discussion of selected neurological diseases in conjunction with normal neurophysiology. Study of neuroprosthesis treatments and design philosophy, functional neural stimulation, and functional muscular stimulation.

### **E E 385V. New Topics in Biomedical Engineering.**

Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **E E 390C. Statistical Methods in Engineering and Quality Assurance.**

The interpretation of data from designed experiments and production processes. Topics include probability distributions, confidence intervals, analysis of variance, hypothesis testing, factorial designs, and quality control data. Three lecture hours a week for one semester. Prerequisite: Graduate standing in engineering and a course in probability and statistics.

### **E E 390V. New Topics in Manufacturing Systems Engineering.**

Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **E E 391C. Technical Entrepreneurship.**

Introduction to the technology-based company: entrepreneurship, intrapreneurship, strategic planning, finance, marketing, sales, operations, research and development, manufacturing, and management. Student teams form hypothetical companies and simulate their ventures over an extended period; presentations and reports are required. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **E E 392K. Antenna Theory and Practice.**

Modern antenna systems for receiving and transmitting, including driven and parasitic arrays, horns, parabolic and other antennas. Three lecture hours a week for one semester. Prerequisite: Graduate standing in electrical engineering.

### **E E 392L. Computational Electromagnetics.**

Fundamental computational modeling and analysis techniques for applications in antennas, microwave circuits, biomedical engineering, and geophysics. Emphasis on boundary-value problem formulation, numerical methods, computer implementation, and error quantification. Includes differential and integral equation-based methods for solving Maxwell's equations in frequency and time domains. Three lecture hours a week for one semester. Electrical Engineering 383V (Topic: Computational Electromagnetics) and 392L may not both be counted. Prerequisite: Graduate standing.

### **E E 392N. Principles of Radar.**

Fundamentals of radar, with an emphasis on electromagnetics and signal processing. Includes radar range equation, antennas, propagation and target scattering, matched filter, ambiguity function, waveform design, pulse compression, microwave imaging, synthetic aperture radar, and

inverse synthetic aperture radar (ISAR). Three lecture hours a week for one semester. Electrical Engineering 383V (Topic: Radar Principles) and 392N may not both be counted. Prerequisite: Graduate standing.

### **E E 393C. Plasma Dynamics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in engineering, physics, chemistry, or mathematics.

**Topic 1: Introduction to Plasma Dynamics.** Plasma properties, including collective effects, Debye shielding, quasineutrality, the plasma frequency, collisions. Single particle motions in electric and magnetic fields. Particle drifts, adiabatic invariants, cyclotron resonance.

### **E E 394. Topics in Power System Engineering.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in electrical engineering, or graduate standing and consent of instructor.

**Topic 7: Power Electronic Devices and Systems.** A study of power electronic components and circuits; HVDC converters; electronic drives for machines; AC/DC converters.

**Topic 9: Power Quality.** The study of electrical transients, switching surges, lightning, and other phenomena that cause deviations in 60-hertz sinusoidal voltages and currents.

**Topic 10: Electromechanical Dynamics.** Same as Mechanical Engineering 384E (Topic 1: Electromechanical Dynamics). Maxwell's equations and transient response of electrical machines.

**Topic 11: Design of Electrical Machines.** Same as Mechanical Engineering 384E (Topic 2: Design of Electrical Machines). Electrical and mechanical design of electrical machines.

**Topic 13: Intelligent Motion for Robotics and Control.** Electric drives and machines used in computers, robotics, and biomedical applications; and special electric drives and machines used in industry and power systems. Includes magnetic circuits and magnetic materials; electromechanical energy conversion principles; rotating and linear machine concepts, including synchronous, induction, DC, and variable reluctance machines; Park's equations; vector and tensor control of induction motors; sensors, actuators, and microcontrollers; and electromagnetic levitation.

**Topic 14: Electrical Transients in Power Systems.** Analysis and modeling of electrical transient phenomena in power systems, traveling wave, insulation coordination, overvoltage protection.

**Topic 16: Restructured Electricity Markets: Locational Marginal Pricing.** Locational marginal pricing (LMP) model of electricity markets. Includes market dispatch formulated as an optimization problem, unit commitment issues, and pricing rules and incentives in markets; energy-price and transmission-price risk hedging and energy network models; and revenue adequacy of financial transmission rights, a mixed-integer programming approach to unit commitment, the representation of voltage constraints into market models, and the design of electricity markets to mitigate market power. Electrical Engineering 394 (Topic 16) and 394V (Topic: Restructured Electricity Markets) may not both be counted.

**Topic 17: Restructured Electricity Markets: Market Power.** Definition and analysis of market power, especially as an issue in the design and functioning of electricity markets. Focus on transmission constraints and offer-based markets that involve locational marginal pricing. Electrical Engineering 394 (Topic 17) and 394V (Topic: Restructured Electricity Markets: Market Power) may not both be counted.

## E E 394J. Energy Systems.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Power System Engineering I.** Physical features, operational characteristics, and analytical models for major electric power systems and components.

**Topic 2: Power System Engineering II.** Advanced techniques for solving large power networks; load flow, symmetrical components, short circuit analysis.

**Topic 9: Wind Energy Systems.** Wind resource characteristics and assessments; wind turbine technologies (fixed and variable-speed turbines); wind power transmission; integration and interconnection issues; and reliability impacts. Electrical Engineering 394J (Topic 9) and 394V (Topic: Wind Energy Systems) may not both be counted.

**Topic 10: Distributed Generation Technologies.** Distributed generation and microgrids elements; microsources; energy storage; power electronics interfaces; DC and AC architectures; economics, operation, stabilization, and control; reliability and availability aspects; interaction between microgrids and bulk power grids; and smart grids. Electrical Engineering 394J (Topic 10) and 394V (Topic: Distributed Generation Technologies) may not both be counted. Additional prerequisite: Knowledge of fundamentals of power electronics and power systems, familiarity with modeling and simulation techniques, and knowledge of how to use professional publications.

**Topic 11: Advanced Topics in Power Electronics.** Modeling and analysis of DC-to-DC converters; analysis of switched systems; real components; power electronics converters for renewable and alternative energy generation and storage; maximum power point tracking; grid interaction; islanding; linear and nonlinear control methods in power electronics; and an introduction to reliability. Electrical Engineering 394J (Topic 11) and 394V (Topic: Advanced Topics in Power Electronics). Additional prerequisites: Consent of instructor.

**Topic 12: Modeling and Simulation of Wind Power Plants.** Analysis, modeling, and simulation of wind turbines and wind farms; fundamentals of wind turbines and technologies, reference-frame theory, dynamic models of induction and synchronous machines, fixed-speed direct-connect, wide-slip, doubly-fed, full-converter wind turbines, operation and control, and interconnection issues. Electrical Engineering 394J (Topic 12) and 394V (Topic: Modeling and Simulation of Wind Power Plants) may not both be counted. Additional prerequisite: Consent of instructor.

## E E 394L. Power Systems Apparatus and Laboratory.

Fundamentals of power systems emphasized through laboratory experiments. Includes complex power, three-phase circuits, per-unit system, transformers, synchronous machines, transmission line models, steady-state analysis, induction machines, capacitor banks, protective relaying, surge arrestors, and instrumentation. Three lecture hours and three laboratory hours a week for one semester. Electrical Engineering 394L and 394V (Topic: Power Systems Apparatus and Laboratory) may not both be counted. Prerequisite: Graduate standing.

## E E 394V. New Topics in Energy Systems.

Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

## E E 396K. Solid-State Device Theory.

Theory of electron, magnetic, and electro-optic devices. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

## Topic 1: Metal Oxide Semiconductor Devices: Physics and Technology.

**Topic 2: Semiconductor Physics.** Introduction to the fundamental physics of charge carrier states in semiconductors, charge carrier interactions among themselves and with the environment, and charge transport in semiconductors and their heterostructures. Additional prerequisite: Electrical Engineering 334K or the equivalent; Electrical Engineering 339 or the equivalent is recommended.

## Topic 4: Synthesis, Growth, and Analysis of Electronic Materials.

## Topic 5: Superconducting Electronic Devices.

## Topic 6: Magnetic Phenomena in Materials.

## Topic 7: MOS Integrated Circuit Process Integration.

**Topic 8: Ultra Large Scale Integration Techniques.** Integrated circuit processing; crystal growth and wafer preparation; epitaxial growth; oxidation, diffusion, and ion implantation; thin-film deposition techniques; lithography and etching. Three lecture hours and three laboratory hours a week for one semester. Additional prerequisite: Electrical Engineering 339 or the equivalent.

**Topic 9: Localized versus Itinerant Electrons in Solids.** Same as Mechanical Engineering 386R (Topic 1: Localized versus Itinerant Electrons in Solids). Description of electrons, from free atoms to crystals; band theory contrasted with crystal-field theory; evolution of electronic properties on passing from magnetic insulators to normal metals, from ionic to covalent solids, from single-valent compounds to mixed-valent systems; electron-lattice interactions and phase transitions; many examples. Additional prerequisite: A semester of quantum mechanics and a semester of solid-state science or technology.

**Topic 10: Ionic Conductors.** Same as Mechanical Engineering 386T (Topic 1: Ionic Conductors).

**Topic 11: High-Temperature Superconductors.** Same as Mechanical Engineering 386T (Topic 2: High-Temperature Superconductors).

**Topic 12: Catalytic Electrodes.** Same as Mechanical Engineering 386T (Topic 3: Catalytic Electrodes).

**Topic 13: Magnetic Materials.** Same as Mechanical Engineering 386T (Topic 4: Magnetic Materials).

## Topic 14: Optical Interconnects.

## Topic 15: Optoelectronics Integrated Circuits.

**Topic 16: Semiconductor Lasers.** Principles of compound semiconductor lasers and LEDs; bulk and quantum-well laser structures; radiative and nonradiative recombination processes; optical, electrical, and thermal properties of lasers; dynamic rate equations and modulation characteristics; lasing spectra, chirp, modal noise and linewidth; edge-emitting and surface-emitting lasers. Additional prerequisite: Electrical Engineering 325, 334K, and 339, or their equivalents.

**Topic 17: Localized-Electron Phenomena.** Same as Mechanical Engineering 386R (Topic 2: Localized-Electron Phenomena). Analysis of the variation in physical properties versus chemical composition of several groups of isostructural transition-metal compounds. Additional prerequisite: A semester of solid-state science and/or quantum mechanics.

**Topic 19: Plasma Processing of Semiconductors I.** Plasma analysis using Boltzmann and fluid equations; plasma properties, including Debye length, quasineutrality, and sheaths; basic collisional properties, including Coulomb and polarization scattering; analysis of capacitive and wave-heated plasma processing reactors.

**Topic 20: Plasma Processing of Semiconductors II.** Plasma chemistry and equilibrium; analysis of molecular collisions; chemical kinetics and surface processes; plasma discharge particle and energy balance; analysis of inductive and DC plasma processing reactors; plasma etching, deposition, and implantation.

**Topic 21: Nanoscale Device Physics and Technologies.** Physical principles and operational characteristics of semiconductor devices.

Physics of metal-oxide-semiconductor field-effect transistors (MOSFET) and bipolar junction transistors (BJT). Advanced discussion of short-channel effects, ultra-thin oxide and high-K gate dielectrics, semiconductor interface characterization, hot-electron effects, lightly-doped drain devices (LDD), subthreshold characteristics, complementary-symmetry metal-oxide-semiconductor (CMOS) latchup, gate-induced leakage current of MOSFETs, poly-depletion and quantum mechanical effects, silicon on insulator (SOI) devices, strained-Si, advanced 3-D devices and bandgap narrowing effect, Webster effect, Kirk effect, punchthrough and avalanche breakdown, base transit time for bipolar transistors, and scaling issues of both BJT and MOSFETs. Additional prerequisite: Electrical Engineering 339 or the equivalent.

**Topic 22: Semiconductor Microlithography.**

**Topic 23: Semiconductor Heterostructures.**

**Topic 24: Microwave Devices.**

**Topic 25: Organic and Polymer Semiconductor Devices.**

**Topic 26: Microelectromechanical Systems.**

**Topic 27: Charge Transport in Organic Semiconductors.**

### **E E 396M. Quantum Electronics.**

Quantum mechanical principles as applied to electron devices, lasers, and electro-optics; material properties and interaction of radiation and material. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in electrical engineering or physics.

**Topic 1: Introductory Quantum Electronics.** Basic quantum mechanics and applications to solid-state phenomena and lasers.

### **E E 396N. Topics in Nanotechnology.**

Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Semiconductor Nanostructures.** Provides theoretical framework for the understanding of electronic properties and electron transport in quantum confined devices; two-dimensional electron systems in semiconductor heterostructures; quantum wires; quantum dots; spintronic devices; growth and fabrication techniques. Electrical Engineering 396V (Topic: Semiconductor Nanostructures) and 396N (Topic 1) may not both be counted. Additional prerequisite: Electrical Engineering 334K and 339, or their equivalents.

### **E E 396V. New Topics in Solid-State Electronics.**

Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 5: Introduction to Solid-State Properties of Materials.** Same as Mechanical Engineering 386P (Topic 4: Introduction of Solid-State Properties of Materials). Introduction to the electronic, magnetic, and optical properties of materials. Solid-state properties of metals, semiconductors, and ceramics; fundamental concepts needed for the description of these properties, using an introductory-level description of the electronic structure of solids. Additional prerequisite: Consent of instructor.

**Topic 6: Special Topics in Semiconductor Lasers.** Dynamic properties of semiconductor lasers; intensity, phase, and frequency noise; dynamic lasing spectra, chirp, and mode partition noise; injection locking and optical feedback; short pulse generation by mode-locking and gain switching; single-mode distributed feedback, distributed Bragg reflector (DBR), and coupled-cavity lasers; wavelength-tunable single-mode lasers; externally modulated lasers; coherent high-power laser arrays; quantum-dot lasers and amplifiers; vertical-cavity surface-emitting lasers; integrated wavelength-division multiplexing (WDM)

laser arrays and photonic integrated circuits. Additional prerequisite: Electrical Engineering 396K (Topic 16: Semiconductor Lasers) or the equivalent.

**Topic 7: Optoelectronics for Optical Networking.** Advanced optical communication systems and optoelectronics technologies, including dense and coarse wavelength division multiplexing, soliton transmission, coherent detection, subcarrier multiplexing, nonregenerative erbium-doped fiber amplifier (EDFA) networks, and Raman amplification. Photonic switching system architectures and optical switching technologies, including both passive and active components. Additional prerequisite: Electrical Engineering 383P (Topic 6: Semiconductor Optoelectronic Devices) and 396K (Topic 16: Semiconductor Lasers), or their equivalents, are recommended.

### **E E 197C, 297C, 397C, 697C, 997C. Research Problems.**

Problem selected by the student with approval of the department. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in electrical engineering and consent of the graduate adviser.

### **E E 197G, 297G, 397G, 697G, 997G. Research Problems.**

Problem selected by the student with approval of the department. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing in electrical engineering and consent of instructor and the graduate adviser.

### **E E 397K. Advanced Studies in Electrical Engineering.**

Selection of topics based on needs of an adequate number of students. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in electrical engineering and consent of instructor.

### **E E 397M. Graduate Research Internship.**

Research associated with enrollment in the Graduate Research Internship Program (GRIP). Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in electrical engineering and consent of instructor.

### **E E 397N. Conference Course.**

The equivalent of three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing in electrical engineering and consent of instructor.

### **E E 197S, 297S, 397S. Graduate Seminar in Electrical Engineering.**

One, two, or three lecture hours a week for one semester. Some sections of Electrical Engineering 197S are offered on the letter-grade basis only; others are offered on the credit/no credit basis only. These sections are identified in the Course Schedule. May be repeated for credit. Prerequisite: Graduate standing.

### **E E 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in electrical engineering and consent of the graduate adviser; for 698B, Electrical Engineering 698A.

### **E E 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite:

Graduate standing in electrical engineering and consent of the graduate adviser.

### **E E 398T. Supervised Teaching in Electrical Engineering.**

Teaching under close supervision for one semester, attending group meetings or individual consultations, and submitting reports as required. Three lecture hours a week, or the equivalent, for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and appointment as a teaching assistant.

### **E E 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **E E 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Electrical Engineering 399R, 699R, or 999R.

## **Engineering Management**

*Master of Science in Engineering*

The engineering management program is offered by the Cockrell School of Engineering and administered by the Center for Lifelong Engineering Education. The mission of the program is to contribute significantly to engineers' managerial leadership abilities within their technological organizations by allowing students an opportunity to pursue higher education that is innovative and intellectually inspiring. The program fulfills this mission by offering courses that teach engineers how to lead and how to manage projects, processes, personnel, products, and services in real-world situations.

### **For More Information**

**Campus address:** Continuing Engineering Education Building (CEE) 2.206, phone (512) 232-5169, fax (512) 471-0831; campus mail code: A2800

**Mailing address:** The University of Texas at Austin, Engineering Management Program, P O Box H, Austin TX 78713-8908

**E-mail:** [utmasters@enr.utexas.edu](mailto:utmasters@enr.utexas.edu)

**URL:** <http://lifelong.engr.utexas.edu/degree/index.cfm>

### **Objectives**

The core objective of the engineering management program is to provide engineers who have chosen to pursue leadership and management career paths with the tools and education that will most directly support their success. The goal of the degree program is to provide engineering professionals with these foundations and to help them continue lifelong learning while employed in industry. Further objectives are to teach students about managing technical, business, and human performance processes in order to achieve corporate goals; to develop and learn core business fundamentals in areas including economics, negotiations, marketing, and decision analysis and risk assessment; and to provide an understanding of marketing risks associated with new products, financing a new venture, and legal issues associated with a new project or product. Additional objectives are to provide a program that is challenging, innovative, and intellectually inspiring; to offer a program for the working professional by offering courses that meet once a month on Friday and Saturday; and to offer an advanced degree in engineering management that meets the needs of technology organizations and industry in the Austin area, the state of Texas, and the world.

The program is designed to give students the knowledge to measure and evaluate technical, business, and human performance processes in engineering environments. In the required courses, listed in the Degree Requirements (p. 165) section, students are expected to develop their perspectives on leadership and management of technology in industry and to gain insight into other management issues critical to leading or managing a technological organization.

The curriculum is designed to help students become better engineering leaders who can manage personnel, projects, processes, products, and services. The program's special scheduling option allows the working professional to earn an advanced degree while maintaining his or her career.

### **Areas of Study**

The interdisciplinary engineering management faculty includes members of several departments of the Cockrell School of Engineering and the McCombs School of Business, as well as from the School of Law. The current research of this faculty includes such topics as engineering economics; decision and risk analysis; economic management and marketing; management of people and organizations; and the legal issues that affect technology, such as product liability and patent law.

### **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Uttarayan Bagchi  
Caroline A Bartel

Richard H Crawford  
Steven P Nichols

### **Admission Requirements**

This two-year program provides graduate education for the working professional who is employed in or planning to move into the field of engineering management. Classes meet all day one Friday and Saturday a month, with an orientation session at the beginning of the program. The program requires a serious commitment on the part of the student and the student's employer. The coursework is rigorous and demanding and can provide an excellent educational experience.

Students must have at least eighteen months of professional experience.

### **Degree Requirements**

The program requires thirty semester hours of graduate coursework, including the following core courses:

Engineering Management 380, Topic 1: *Managing People and Organizations*

Engineering Management 380, Topic 2: *The Art and Science of Negotiations*

Engineering Management 380, Topic 3: *Advanced Marketing Management*

Engineering Management 381, Topic 1: *Legal Issues for Engineering Managers*

Engineering Management 383, Topic 1: *Management of Projects and Processes*

Engineering Management 383, Topic 2: *Strategic Decision and Risk Analysis*

Engineering Management 383, Topic 3: *Creativity, Innovation, and Product Development*

Engineering Management 384, *Engineering Economics*

The student must also complete six semester hours in a projects course, Engineering Management 397P, *Projects in Engineering Management*.

# Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

Classes generally meet once a month, all day on Friday and Saturday.

## Engineering Management: ENM

### ENM 380. Topics in Engineering Management.

Engineering management theories of social and psychological behavior, and how these theories are used by administrators and managers. Meets all day Friday and Saturday once a month for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the engineering management degree program.

**Topic 1: Managing People and Organizations.** Offered on the letter-grade basis only.

**Topic 2: The Art and Science of Negotiations.** Current issues in organization science. Offered on the letter-grade basis only.

**Topic 3: Advanced Marketing Management.** Major marketing concepts and variables, their interrelationships, and their implications for policymaking, problem solving, and strategy formulation. Offered on the letter-grade basis only.

### ENM 381. Legal Issues in Engineering Management.

Legal considerations in the practice of engineering management. Meets all day Friday and Saturday once a month for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the engineering management degree program.

**Topic 1: Legal Issues for Engineering Managers.** Legal considerations in the practice of engineering; specifications and contracts for equipment and engineering services. Offered on the letter-grade basis only.

### ENM 382. Management Simulations in Engineering Management.

Management simulations in the practice of engineering management. Meets all day Friday and Saturday once a month for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the engineering management degree program.

### ENM 383. Decision Making in Engineering Management.

Management of engineering decision-making processes and practices. Meets all day Friday and Saturday once a month for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the engineering management degree program.

**Topic 1: Management of Projects and Processes.** Methods for organizing, coordinating, and controlling resources to minimize risk and conflict and to maintain budgets and schedules. Topics include evaluation of competing alternatives, organization of a project, scheduling of tasks and resources, and the role of management over time. Offered on the letter-grade basis only.

**Topic 2: Strategic Decision and Risk Analysis.** Fundamentals of decision analysis and risk assessment; mathematical and

psychological aspects of decision making, especially under uncertain conditions; engineering and project management applications. Offered on the letter-grade basis only.

**Topic 3: Creativity, Innovation, and Product Development.** Analysis of design at chip, board, and system levels; life cycle implications of design decisions; economic and customer-driven factors. Offered on the letter-grade basis only.

### ENM 384. Engineering Economics.

Introduction to fundamental concepts in finance and their application. Emphasis on how to evaluate investment and financing opportunities in a corporation. Examines investments, capital structure choice, financial models, and issues in corporate control. Meets all day Friday and Saturday once a month for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the engineering management degree program.

### ENM 385C. Projects in Engineering Management I.

Restricted to students in the engineering management program. First course in a two-semester sequence that concludes with Engineering Management 385D. Independent project carried out under the supervision of an engineering management faculty member. Individual instruction. Engineering Management 385C and 397P may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### ENM 385D. Projects in Engineering Management II.

Restricted to students in the engineering management program. Continuation of Engineering Management 385C. Independent project carried out under the supervision of an engineering management faculty member. Individual instruction. Engineering Management 385D and 397P may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing and Engineering Management 385C.

### ENM 397K. Engineering Management Seminar.

Current topics in engineering management. Conference course. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and admission to the engineering management degree program.

### ENM 397P. Projects in Engineering Management.

Independent project carried out under the supervision of an engineering management faculty member. Conference course. May be repeated once for credit. Engineering Management 385C and 397P may not both be counted. Engineering Management 385D and 397P may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing and admission to the engineering management degree program.

### ENM 698. Thesis.

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in engineering management and consent of the graduate adviser. For 698B, Engineering Management 698A.

### ENM 398R. Master's Report.

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and admission to the engineering management degree program.

# Engineering Mechanics

*Master of Science in Engineering  
Doctor of Philosophy*

## For More Information

**Campus address:** W. R. Woolrich Laboratories (WRW) 215D, phone (512) 471-7595, fax (512) 471-3788; campus mail code: C0600

**Mailing address:** The University of Texas at Austin, Graduate Program in Engineering Mechanics, Department of Aerospace Engineering and Engineering Mechanics, 210 East 24th Street Stop C0600, Austin TX 78712-1221

**E-mail:** ase.grad@mail.ae.utexas.edu

**URL:** <http://www.ae.utexas.edu/>

## Objectives

The engineering mechanics graduate program is involved in teaching and research in analytical, computational, and experimental methods in mechanics of solids, structures, and materials and fluid mechanics. The objectives of the program are to enable the student to attain a deeper understanding of engineering mechanics fundamentals, a knowledge of recent developments, and the ability as a master's degree student to participate in research and as a doctoral degree student to conduct individual research. The goals are accomplished through coursework, seminars, and active research programs.

## Areas of Study and Facilities

Graduate study and facilities for research are offered in the areas of theoretical mechanics and applied mathematics, dynamics, computational mechanics, experimental fluid mechanics, computational fluid dynamics, finite element methods, boundary element methods, experimental mechanics, solid and structural mechanics, and structural dynamics. The extensive facilities of Information Technology Services and related hardware for interactive computer graphics and real-time control of experiments are available to graduate students for research use. For experimental research, the Department of Aerospace Engineering and Engineering Mechanics maintains laboratory facilities on the main campus and at the J. J. Pickle Research Campus. These facilities include equipment for studies in high-velocity impact, structural dynamics, and materials science. A well-equipped machine shop is partially supported by the department, and technical assistance is available when required.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Ivo M Babuska	Kenneth M Liechti
Jeffrey K Bennighof	Nanshu Lu
Tan T Bui	Mark E Mear
Clinton N Dawson	J T Oden
Leszek F Demkowicz	Krishnaswa Ravi-Chandar
Rui Huang	Gregory J Rodin
Thomas J Hughes	Jayant Sirohi
Stelios Kyriakides	Byron D Tapley
Chad M Landis	Mary F Wheeler

## Degree Requirements

Candidates for a graduate degree in engineering mechanics must meet all the general requirements for advanced degrees. Particular details are given below.

### Master of Science in Engineering

Before being admitted to candidacy, the student must have a satisfactory proficiency in basic and intermediate material in engineering mechanics

and mathematics. Students entering without an undergraduate degree in engineering are usually required to do some remedial work at the undergraduate level. A master's degree program normally consists of twenty-four semester hours of graduate coursework in engineering mechanics and related fields, and six semester hours in the thesis course. Two optional routes to the master's degree are available by petition to the Graduate Studies Committee. These are thirty-six hours of coursework with no thesis or report and thirty hours of coursework and a report based on work done in an additional prescribed conference course. Details of the options and requirements pertaining to course selection are given in instructions supplied by the department.

### Doctor of Philosophy

Doctoral candidates must fulfill the basic course requirements prescribed for candidates for the master's degree. Beyond that, the course program is tailored to each student's needs.

Before being admitted to candidacy for the degree, the student must pass both a written and an oral qualifying examination on graduate-level material in mechanics and mathematics.

After being admitted to candidacy, the student completes coursework, carries out an acceptable program of original research, and writes a dissertation covering this research. The committee appointed to approve the Program of Work and the dissertation examines the student for both breadth and depth of knowledge. Examinations may be oral or written or both and must include a public defense of the dissertation.

Further information about policy, procedure, and requirements is available from the Department of Aerospace Engineering and Engineering Mechanics.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Engineering Mechanics: E M

#### E M 380. Theory of Plasticity.

Physical basis of plastic deformation; mathematical theory of incremental plasticity; total theories; numerical implementation; slip and physical theories of plastic deformation; rate dependent (viscoplastic) models; applications to several engineering problems. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Engineering Mechanics 388 or the equivalent.

#### E M 381. Advanced Dynamics.

Dynamics of systems of particles and rigid bodies; vibration theory; analytical dynamics, including Lagrangian and Hamiltonian formulations; dynamic stability; continuous systems. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### E M 382. Nonlinear Analysis.

Methods for analyzing various types of nonlinear differential equations of dynamical systems; exact methods, perturbation and averaging techniques, direct method of Liapunov. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

**E M 384K. Continuum Mechanics.**

Foundations of the general nonlinear theories of continuum mechanics; general treatment of motion and deformation of continua, balance laws, constitutive theory; particular application to elastic solids and simple materials. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Engineering Mechanics 386K or consent of instructor.

**E M 384L. Structural Dynamics.**

Same as Aerospace Engineering 384P (Topic 3: Structural Dynamics). Free and forced vibration of single-degree-of-freedom, multiple-degree-of-freedom, and continuous systems. Lagrange's equations and Hamilton's principle; discretization of continuous systems; numerical methods for response and algebraic eigenvalue problems. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

**E M 386K. Analytical Methods I.**

Basic topics in real and complex analysis, ordinary and partial differential equations, and other areas of applied mathematics with application to applied mechanics. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**E M 386L. Analytical Methods II.**

Continuation of Engineering Mechanics 386K. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Engineering Mechanics 386K or consent of instructor.

**E M 386M. Functional Analysis in Theoretical Mechanics.**

Same as Computational Science, Engineering, and Mathematics 386M. An introduction to modern concepts in functional analysis and linear operator theory, with emphasis on their application to problems in theoretical mechanics; topological and metric spaces, norm linear spaces, theory of linear operators on Hilbert spaces, applications to boundary value problems in elasticity and dynamical systems. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 386M, Computational Science, Engineering, and Mathematics 386M, Engineering Mechanics 386M. Prerequisite: Graduate standing, Engineering Mechanics 386L, and Mathematics 365C.

**E M 386N. Qualitative Methods in Nonlinear Mechanics.**

A study of methods for assessing the qualitative behavior of solutions to equations governing nonlinear continuum mechanics. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Engineering Mechanics 386M.

**E M 387. Foundations of Fluid Mechanics.**

Governing equations in differential and integral forms; applications to both inviscid and viscous flow problems. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**E M 388. Solid Mechanics I.**

Same as Aerospace Engineering 384P (Topic 1: Solid Mechanics I). Mathematical description of stress, deformation, and constitutive equations of solid mechanics; boundary value problems of elasticity. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

**E M 388F. Fracture Mechanics.**

Griffith theory of brittle crack propagation, other theories, crack toughness testing concepts. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Engineering Mechanics 388 or consent of instructor.

**E M 388L. Solid Mechanics II.**

Same as Aerospace Engineering 384P (Topic 2: Solid Mechanics II). Continuation of Engineering Mechanics 388. Additional topics in elasticity, plasticity, viscoelasticity, variational methods, and other areas of solid mechanics. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Engineering Mechanics 388 or Aerospace Engineering 384P (Topic 1), and consent of instructor.

**E M 388M. Micromechanics.**

Constitutive characterization of materials based on their microstructure. Relationships between internal structure and mechanical properties for composites, polycrystals, and polymers on the basis of linear elasticity, plasticity, and theories that account for rate-dependence. Three lecture hours a week for one semester. Prerequisite: Graduate standing and a graduate course in solid mechanics.

**E M 388V. Theory of Viscoelasticity.**

Introduction to linear viscoelasticity; methods of characterizing viscoelastic material behavior; analytical and approximate solution techniques for engineering problems, including contact, wave propagation, and thermoviscoelastic problems. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Engineering Mechanics 388 or consent of instructor.

**E M 389J. Experimental Mechanics.**

Principles and techniques of measurement in mechanics; includes discussion of strain gauges, optical interference methods, photoelasticity, and dynamic measurements. Two lecture hours and three laboratory hours a week for one semester. Prerequisite: Graduate standing.

**E M 392R. Random Vibrations.**

Introduction to probability theory and its application to random excitation of linear and nonlinear systems; a probabilistic discussion of failure and fatigue in structures. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**E M 393N. Numerical Methods for Flow and Transport Problems.**

Approximate solution methods for flow and transport problems in engineering and applied science. Finite element, finite difference, and residual methods for linear and nonlinear problems. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**E M 394. Structural Stability.**

Fundamental theory of buckling of elastic structural elements such as bars, frames, rings, plates, and shells; also special stability topics including inelastic buckling, creep buckling, and buckling under dynamic loading. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Engineering Mechanics 388 or consent of instructor.

**E M 394F. Finite Element Methods.**

Same as Aerospace Engineering 384P (Topic 4: Finite Element Methods) and Computational Science, Engineering, and Mathematics 393F. Derivation and implementation of the finite element method; basic coding techniques; application to problems of stress and diffusion. Three lecture hours a week for one semester. Only one of the following may be counted: Aerospace Engineering 384P (Topic 4), Computational and Applied Mathematics 394F, Computational Science, Engineering, and Mathematics 393F, Engineering Mechanics 394F. Prerequisite: Graduate standing and consent of instructor.

**E M 394G. Computational Techniques in Finite Elements.**

Organization and data management in finite element codes; element models and calculations; equation solving; preprocessing and



postprocessing. Three lecture hours a week for one semester.  
Prerequisite: Graduate standing and Engineering Mechanics 394F.

### **E M 394H. Advanced Theory of Finite Element Methods.**

Contemporary topics in the theory and application of finite element methods. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Engineering Mechanics 394F, and Engineering Mechanics 386L or the equivalent.

### **E M 394V. Wave Propagation I.**

Solutions of linear wave equations; waves in elastic media, including plates and cylinders; transient waves, transform methods, asymptotic approximation. Three lecture hours a week for one semester.  
Prerequisite: Graduate standing, and Engineering Mechanics 388 or consent of instructor.

### **E M 397, 697, 997. Advanced Studies in Engineering Mechanics.**

For each semester hour of credit earned, one lecture hour a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

#### **Topic 1: Advanced Topics in Viscoelasticity.**

**Topic 2: Individual Research.** Offered on the credit/no credit basis only.

#### **Topic 3: Advanced Computational Flows and Transport.**

#### **Topic 4: Grid Generation and Adaptive Grids.**

#### **Topic 5: Adaptive Boundary/Finite Element Methods.**

### **E M 397R. Individual Research.**

Must be arranged by mutual agreement between student and faculty member. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **E M 397S. Mechanics Seminar.**

Current topics in mechanics. Conference course. All engineering mechanics graduate students are required to register for either Engineering Mechanics 397S or 397T each semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **E M 397T. Computational Mechanics Seminar.**

Current topics in computational mechanics. Conference course. All engineering mechanics graduate students are required to register for either Engineering Mechanics 397S or 397T each semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **E M 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in engineering mechanics and consent of the supervising professor and the graduate adviser; for 698B, Engineering Mechanics 698A.

### **E M 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in engineering mechanics and consent of the graduate adviser.

### **E M 398T. Supervised Teaching in Engineering Mechanics.**

Teaching methods and objectives, criteria for evaluating teaching effectiveness, procedures and regulations, laboratory teaching. Three

lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and appointment as a teaching assistant.

### **E M 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **E M 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Engineering Mechanics 399R, 699R, or 999R.

## **Materials Science and Engineering**

*Master of Science in Engineering*

*Doctor of Philosophy*

### **For More Information**

**Campus address:** Engineering Teaching Center II (ETC) 8.172, phone (512) 471-1504, fax (512) 475-8482; campus mail code: C2201

**Mailing address:** The University of Texas at Austin, Materials Science and Engineering Program, 204 E. Dean Keeton Street Stop C2201, Austin TX 78712

**E-mail:** mse@tmi.utexas.edu

**URL:** <http://www.tmi.utexas.edu/>

### **Objectives**

This program is designed to educate materials scientists and engineers, to develop new knowledge, and to solve problems related to the synthesis, processing, characterization, and application of materials.

### **Facilities for Graduate Work**

Extensive facilities, including laboratories for materials research and instruction and offices for faculty members and students, are located in several buildings on the main campus and at the J. J. Pickle Research Campus. The offices for the Texas Materials Institute (TMI), the materials science and engineering graduate program, and numerous faculty members are located in the Engineering Teaching Center. Core central facilities for research include the Electron Microscopy, X-Ray Scattering, Surface Analysis, Nanofabrication and Testing, Electronic and Vibrational Scattering, Microelectronic Materials Processing, Organic Electronic Fabrication, Scanning Probe, X-ray Photoelectron Spectroscopy, Time-of-Flight Mass Spectrometry, and Polymer Characterization Facilities, each of which employs a manager to assist users. Other laboratories provide mechanical testing, powder processing, corrosion testing, crystal growing, and ultrasonic, laser, magnetic, and microwave facilities for use by students and faculty members.

### **Areas of Study**

Graduate study is focused around concentrations in nanomaterials, clean energy materials, and general materials science and engineering. Course requirements are tailored to the specific concentration.

### **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Deji Akinwande  
Sanjay K Banerjee  
Allen J Bard  
Michael F Becker  
Nicole A Benedek  
David L Bourell  
R Malcolm Brown Jr  
Jonathan Yan Chen  
Ray T Chen  
Alejandro L De Lozanne  
Ananth Dodabalapur  
John G Ekerdt  
Donglei Fan  
Paulo J Ferreira  
John B Goodenough  
Paul S Ho  
Rui Huang  
Gyeong S Hwang  
Keith P Johnston  
Maria G Juenger  
John W Keto  
Brian A Korgel  
Desiderio Kovar

Mourad Krifa  
Wei Li  
Xiaoqin E Li  
Kenneth M Liechti  
Nanshu Lu  
Arumugam Manthiram  
Tessie J Moon  
Charles B Mullins  
Donald R Paul  
Llewellyn K Rabenberg  
Kenneth M Ralls  
Juan M Sanchez  
Li Shi  
Chih-Kang Shih  
Keith J Stevenson  
Eric M Taleff  
Yaguo Wang  
Harovel G Wheat  
Carlton G Willson  
Bugao Xu  
Edward T Yu  
Guihua Yu  
Yuebing Zheng

coursework must be taken. Up to nine hours of upper-division coursework may be counted. Enrollment in this option must be approved by the graduate adviser.

**Master of Science in Engineering without thesis or report.** For students electing this option, thirty-six semester hours of coursework are required. Nine hours in core courses and an additional eighteen to twenty-four hours in advanced-level courses must be taken. The program must be approved by the graduate adviser. Up to nine hours of upper-division coursework may be included. No research is required, but the level of academic performance is the same as that required for the master's degree with thesis.

## Doctor of Philosophy

A student may choose to pursue the doctoral degree without first obtaining a master's degree. Before admission to doctoral candidacy, the student must have a master's degree in materials science and engineering or an equivalent amount of graduate credit and must have demonstrated satisfactory performance on each part of the doctoral qualifying process. The doctoral candidate must also pass preliminary and final oral examinations covering the research program and the underlying science and engineering upon which the research is based. For a student with a Bachelor of Science degree, at least three years are required to complete the Doctor of Philosophy degree program.

## Admission Requirements

Students with a bachelor's degree in engineering or in one of the physical sciences may be admitted to the materials science and engineering degree program upon the recommendation of the Graduate Studies Committee. Students who do not have a background that the committee considers satisfactory for the study of advanced materials science and engineering will be required to take preparatory coursework, some of which may be at the undergraduate level. Completion of some coursework may be required before the student begins the work for the graduate degree.

## Degree Requirements

### Master of Science in Engineering

The student's program of coursework is selected with the advice of the graduate adviser and must be approved by the Graduate Studies Committee. All students must complete deficiency, core, and advanced-level courses. (Individual deficiency may be waived if the student has equivalent credit on entering the program.) The specific course requirements vary for each concentration.

At least one full year is required to complete the master's degree program.

**Master of Science in Engineering with thesis.** For students electing this option, thirty semester hours of credit are required, consisting of twenty-four hours of organized coursework and six hours in the thesis course. Students begin the program by completing deficiency courses, but they may petition to waive these courses if they have equivalent credit. Nine hours in core courses and nine to fifteen additional hours in advanced-level courses must then be taken. A maximum of six hours of upper-division coursework may be counted toward the required thirty hours.

The student should choose a thesis research topic and begin research during the first semester.

**Master of Science in Engineering with report.** This option requires thirty-three semester hours of credit, consisting of thirty hours of organized coursework and three hours in the report course. The program must be approved by the graduate adviser. At least nine hours in core courses and an additional fifteen to twenty-one hours of advanced-level

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Materials Science and Engineering: MSE

#### MSE 389. Topics in Materials Science and Engineering.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor; additional prerequisites may vary with the topic.

#### MSE 397. Graduate Seminar.

Presentation of research topics by invited speakers, faculty, and students. Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### MSE 197R, 297R, 397R. Research.

Individual research. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### MSE 698. Thesis.

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in materials science and engineering and consent of the graduate adviser; for 698B, Materials Science and Engineering 698A.

#### MSE 398R. Master's Report.

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in materials science and engineering and consent of the graduate adviser.

### **MSE 399R, 699R, 999R. Dissertation.**

Research leading to the Doctor of Philosophy in materials science and engineering. Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **MSE 399W, 699W, 999W. Dissertation.**

Research leading to the Doctor of Philosophy in materials science and engineering. Offered on the credit/no credit basis only. Prerequisite: Materials Science and Engineering 399R, 699R, or 999R.

## **Mechanical Engineering**

*Master of Science in Engineering  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Engineering Teaching Center II (ETC) 5.204, phone (512) 471-1136, fax (512) 471-8727; campus mail code: C2200

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Mechanical Engineering, 204 East Dean Keeton C2200, Austin TX 78712-1591

**E-mail:** [go@me.utexas.edu](mailto:go@me.utexas.edu)

**URL:** <http://www.me.utexas.edu/graduate/>

### **Objectives**

The graduate program in mechanical engineering is designed to educate engineers who will be in the forefront of the mechanical engineering profession, leading the way to new and improved engineering systems to transform energy, materials, and information to meet the needs of society. To achieve this objective, the program offers a breadth of research and study areas and facilities. The faculty values creativity, the novel application of fundamental engineering science, interdisciplinary activities, the development of future leaders and a community of scholars, professionalism, and excitement in discovery. The program is designed to enhance these values, drawing upon the diverse interests and experience of the faculty. The major areas of emphasis are described below.

### **Areas of Study and Facilities**

**Acoustics.** The Departments of Mechanical Engineering and Electrical and Computer Engineering offer an interdisciplinary course of study in this field. Research projects are carried out in physical acoustics, industrial acoustics, electroacoustics, nonlinear acoustics, underwater acoustics, and biomedical acoustics. Major experimental facilities include a general-purpose acoustics laboratory, a transducers laboratory, an anechoic chamber, a reverberation chamber, waveguides for high-intensity sound, a computer-controlled water tank for ultrasonics, and extensive underwater sound facilities at the Applied Research Laboratories.

**Biomechanical engineering.** This concentration provides studies for application of mechanical engineering principles to biological and medical problems. Areas of study are physiology, bioheat transfer, biomaterials, biorheology, health physics, biosignal analysis, biomechanics, ultrasonics, and biomedical computing. Supporting courses and facilities are also provided through the Department of Biomedical Engineering.

**Dynamic systems and control.** This concentration offers intensive study in the analysis, design, and control of engineered and natural systems. Areas of study include applied mechanics, biomedical engineering, constitutive modeling of materials, electromechanics, information and control theory, mechanisms and robotics, mechatronics, modeling of multienergy domain systems, multibody dynamics, simulation and

analysis of system dynamics, tribology, and vibrations. Laboratories and facilities are available for research in acoustics, biomechanics, control systems, mechatronics, robotics, system dynamics, and tribology.

**Manufacturing and decision systems engineering.** Manufacturing and decision systems engineering (MDSE) embraces the broad spectrum of knowledge required by decision makers in the realms of manufacturing and service systems. Courses in MDSE cover topics drawn from mechanical systems and design, thermal and fluid systems, materials science and engineering, operations research and industrial engineering, and leadership and entrepreneurship. Major research facilities are available for graduate students in this field.

**Manufacturing and design.** The concentration in manufacturing and design offers state-of-the-art programs in innovative manufacturing processes, product design and development, and supporting technologies. Areas of study include product design methods, layer-based manufacturing (solid freeform fabrication), machine design, unit manufacturing processes, robotics, contemporary prototyping, reverse engineering, optimization techniques, computer-aided design and manufacturing (CAD/CAM), computational geometry, machine intelligence, and design for people with disabilities. Well-equipped laboratories are available for research in solid freeform fabrication (including selective laser sintering), product modeling and simulation, unit manufacturing processes, robotics, one-off prototyping (such as CNC processes, woodworking equipment, power tools, and product measurement equipment), scaled manufacturing (from macro to meso to micro), biomedical device fabrication, and laser-based processes. These laboratories are part of the Advanced Manufacturing Center.

An alternatively scheduled master's degree program in advanced manufacturing engineering, a subarea of manufacturing and design, also exists but is inactive. More information is available from the graduate adviser.

**Materials engineering.** This concentration encompasses graduate study in the fields of materials development, characterization and processing, and in structure-property-performance relationships. Areas of study include ceramics, physical metallurgy, mechanical behavior, materials processing, fuel cells, high-energy density batteries, new materials development, nanomaterials and nanotechnology, corrosion, and microelectronics packaging. Laboratory facilities include scanning and transmission electron microscopes; X-ray scattering, metallographic, laser processing, thermal analysis, and thin-film characterization facilities; and mechanical, electrical, magnetic, and electrochemical property measurement equipment. The Department of Mechanical Engineering is also a primary participant in the interdisciplinary materials science and engineering graduate degree program.

**Nuclear and radiation engineering.** This concentration provides graduate study and research in nuclear radiation science, analysis and design of nuclear systems, and experimental techniques in nuclear technology. Emphasis is on radiation transport and measurements, neutron physics, health physics and dosimetry, transport and disposal of nuclear wastes, and nuclear material safeguards and disposition. The Nuclear Engineering Teaching Laboratory is equipped with a 1.1-MW TRIGA pulsing nuclear reactor; a cold neutron source with prompt gamma analysis; neutron radiography equipment; neutron activation analysis equipment, including a pneumatic transfer system; californium-252 neutron sources; a low-level gamma-ray counting system and many radiation detection systems; and extensive computational capabilities.

**Thermal/fluid systems.** This concentration offers graduate study and research in the areas of thermodynamics, heat and mass transfer, fluid mechanics, combustion, energy conversion, energy conservation, alternative energy, microscale heat transfer, microfluidics, advanced laser-materials processing, and thermoelectrics. Experimental facilities

include subsonic wind tunnels, three-dimensional laser-Doppler anemometry, a micro/nano fabrication facility, scanning probe microscopy, a cryogenic measurement facility, instrumentation calibration facilities for semiconductor rapid thermal processing, fundamental combustion research facilities, engine and emission test facilities, solar energy components and systems, and various fluid mechanics and heat transfer equipment. The University's computational resources for numerical investigations are state-of-the-art and extensive.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Andrea Alu	Dale E Klein
Vaibhav Bahadur	Desiderio Kovar
Chandrajit L Bajaj	Erhan Kutanoglu
Jonathan F Bard	Sheldon Landsberger
Ronald E Barr	Wei Li
Joseph J Beaman Jr	Raul G Longoria
Adela Ben-Yakar	Arumugam Manthiram
Nicole A Benedek	Glenn Y Masada
Halil Berberoglu	Ronald D Matthews
J Eric Bickel	Tessie J Moon
Steven R Biegalski	Robert D Moser
George Biros	Jayathi Murthy
David G Bogard	Richard R Neptune
Maura Borrego	Steven P Nichols
David L Bourell	Raymond Lee Orbach
Michael D Bryant	Llewellyn K Rabenberg
Dongmei Chen	Kenneth M Ralls
Richard H Crawford	Christopher G Rylander
Michael Arthur Cullinan	Marissa Nichole Rylander
Mark Deinert	Michael S Sacks
Ashish Deshpande	Juan M Sanchez
Kenneth R Diller	Erich A Schneider
Ned Dimitrov	Carolyn C Seepersad
Dragan Djurdjanovic	Luis Sentis
Janet L Ellzey	Li Shi
Stanislav Emelianov	S V Sreenivasan
Ofofodike A Ezekoye	James Samuel Sulzer
Eric P Fahrenthold	Eric M Taleff
Donglei Fan	Hu Tao
Benito Fernandez	Delbert Tesar
Paulo J Ferreira	Charles E Tinney
Omar Ghattas	Eric Van Oort
John B Goodenough	Yaguo Wang
Matthew J Hall	Michael E Webber
Neal A Hall	Harovel G Wheat
Mark F Hamilton	Preston S Wilson
John J Hasenbein	Guihua Yu
Paul S Ho	Yuebing Zheng
Aida Khajavirad	

## Admission Requirements

To enter the graduate program in mechanical engineering, a student should have an undergraduate degree in engineering or in an equivalent quantitative field of study. Students who do not meet this requirement may have to take additional courses at the discretion of the graduate adviser.

## Degree Requirements

### Master of Science in Engineering

There are generally three options under which a student may pursue the MSEM degree. Most students follow the thesis option, which requires thirty semester hours of credit, including six hours in the thesis course. Students who are appointed as teaching assistants or research assistants are expected to choose the thesis option. Except for students in manufacturing and decision systems engineering (MDSE), the report option requires thirty-three semester hours, including three hours in the report course; the MDSE concentration requires thirty-six hours, including three in the report course. The option without thesis or report requires thirty-six hours of coursework. At least eighteen hours (including the thesis or report, if any) should be in the major area; at least six hours should be in a supporting area. The supporting courses may be in mechanical engineering but must represent a specialty distinct from the major courses. Some areas of study have required core courses.

The Department of Mechanical Engineering also offers an online MSEM degree program designed for working professionals. Students may complete the thirty-hour program in two years. Courses are taught online by faculty in the Department of Mechanical Engineering to the same standards as the traditional MSEM program. The online program is administered by the Cockrell School of Engineering's Center for Lifelong Engineering Education (<http://lifelong.engr.utexas.edu/pme/msme.cfm>) (CLEE), which publishes additional information.

### Doctor of Philosophy

The student must pass a qualifying examination consisting of either: a) an examination administered by faculty members in the area of specialty, or b) a written examination administered by the department, followed by an oral examination administered by a faculty committee formed by the student's faculty adviser. After passing the qualifying examination, the student applies for candidacy by submitting a Program of Work that includes a proposed dissertation topic and a suggested dissertation committee. The dissertation committee recommends courses to be taken as part of the Program of Work, which should include at least eighteen hours (for students with a master's degree) or thirty-six hours (for students without a master's degree) of graduate coursework in the area of specialization. This coursework must be taken on the letter-grade basis. The Program of Work must be approved by the chair of the Graduate Studies Committee. Application for candidacy must be submitted before the student completes fifty hours of credit toward the doctoral degree.

### Dual Degree Program

The Department of Mechanical Engineering offers the following dual degree program in cooperation with the McCombs School of Business. More information is available from the graduate adviser in each program.

Field(s) of Study	Degree(s)
Business administration	Master of Business Administration

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## Mechanical Engineering: M E

### M E 180M, 280M, 380M, 680M, 980M. Research.

Individual research. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in mechanical engineering.

### M E 380Q. Mathematical Methods in Engineering.

Applications of mathematical analysis and numerical concepts to typical engineering problems. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and Mathematics 427K or the equivalent.

**Topic 1: Engineering Analysis: Analytical Methods.** Analytical solutions for linear ordinary differential equations; numerical integration of ordinary differential equations; Fourier series and integrals; the Laplace transform; the solution of partial differential equations; vector analysis and linear transformations.

**Topic 2: Engineering Analysis: Advanced Analytical Methods.** Classification and solution of partial differential equations; includes linear superposition, separation of variables, Fourier and Laplace transform methods, Green's functions, similarity solution, and spectral methods; introduction to solution of nonlinear partial differential equations, including both exact and approximate techniques, with a strong emphasis on physical systems.

**Topic 3: Perturbation Methods.** Introduction to perturbation theory; regular expansions and sources of nonuniformities; method of strained coordinates and multiple scales; method of matched asymptotic and composite expansions. Places strong emphasis on the relationship between the physical and the mathematical basis and on the crucial role of nondimensionalization in problem solving.

**Topic 4: Numerical Methods for Differential Equations.** Numerical solution of ordinary differential equations, both initial and boundary value equations; includes quasilinearization, shooting methods, and method of adjoints; classification and solution of partial differential equations by the finite difference method; stability and convergence criteria for various schemes; special attention to nonlinear equations with a strong emphasis on the Navier-Stokes equations.

### M E 381P. Dynamics of Fluids.

Detailed study of fluid dynamics, boundary layer phenomena, and incompressible flows. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Fundamentals of Incompressible Flow.** Fundamentals. Kinematic and dynamic equations for compressible viscous flow, incompressible flow criteria, viscous flow patterns, and solution methods.

**Topic 2: Compressible Flow and Turbomachinery.** Two-dimensional flow at subsonic and supersonic Mach numbers, method of characteristics, shock tubes, oblique shocks, wave interactions.

**Topic 3: Dynamics of Turbulent Flow.** Fundamentals of turbulence, including scaling, transport, and kinetic energy of turbulence; wakes, jets; wall-bounded flows; spectrum of turbulence.

**Topic 4: Multiscale Flow and Transport Phenomena.** Fundamentals of flow and transport phenomena in multiscale systems, including momentum, energy, and mass transport phenomena at the microscale; surface tension (capillarity); electrokinetics; micro-scale transport in porous media; multi-phase flow; rheology; and complex fluids.

**Topic 5: Applications of Incompressible Flow.** Dynamics of vorticity, inviscid flow; boundary layer theory and computational techniques, linear stability theory for parallel flow, flow at moderate Reynolds number.

### M E 381Q. Thermodynamics.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and Mechanical Engineering 326 or the equivalent.

**Topic 1: Advanced Thermodynamics.** Development of macroscopic thermodynamics from basic physical relationships; introduction to the thermodynamics of mixtures.

**Topic 4: Molecular Gas Dynamics.** Same as Aerospace Engineering 382R (Topic 6: Molecular Gas Dynamics). Kinetic theory, thermodynamics, statistical mechanics. Applications: equilibrium gas properties, chemical kinetics, interaction of matter with radiation, rarefied gas dynamics.

### M E 381R. Heat Transfer and Rate Processes.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and Mechanical Engineering 339 or the equivalent.

**Topic 1: Advanced Conductive Heat Transfer.** Modeling approaches for composite systems; phase change in conduction-dominant heat transfer systems; analysis of complex source terms in conduction systems; conduction physics at material interfaces; coupled thermo-mechanical response in conduction systems; and solution techniques for multidimensional, unsteady conduction phenomena.

**Topic 2: Advanced Convective Heat and Mass Transfer.** Fundamental study of momentum, energy, and mass transport in convective systems in laminar and turbulent regimes, and several flow configurations.

**Topic 3: Radiation Heat Transfer.** Thermal radiation, blackbody properties, surface properties, radiant exchange, absorbing and emitting media, combined modes.

**Topic 4: Fundamentals of Heat and Mass Transfer.** Fundamentals of conduction, convective heat transfer, diffusive and convective mass transfer, thermal radiative exchange.

**Topic 5: Radiation in Participating Media.** Methods for treating thermal radiation in absorbing, transmitting, and scattering media.

**Topic 6: Multiphase Flow and Heat Transfer.** Heat, mass, and momentum transfer in multi-phase flow systems: flows with particles, drops and bubbles, boiling, condensation, and absorption.

**Topic 7: Nanoscale Energy Transport and Conversion.** Nanoscale transport phenomena and energy conversion processes. Parallel theoretical treatment of transport and conversion processes of electrons, phonons, photons, and molecules in various applications including photovoltaic and thermoelectric energy conversions, microelectronics, nanomaterials, and laser materials processing.

### M E 382N. Computational Fluid Dynamics.

Numerical analysis applied to fluid flow and heat transfer problems. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Introduction to Computational Fluid Dynamics.** Applied numerical analysis, including solution of linear algebraic equations and ordinary and partial differential equations; modeling of physical processes, including fluid flow and heat and mass transfer; use of general-purpose computer codes, including commercial computational fluid dynamics software. Additional prerequisite: Mechanical Engineering 339 or the equivalent.

**Topic 2: Computational Methods for Thermal Fluid Systems.** Introduction to the use of computational tools in the analysis of thermal-fluid systems, with particular emphasis on verification of results and error analysis. Included are interpolation, differentiation, quadrature, solution of linear and non-linear equations, optimization, differential

equations and statistics. Additional prerequisite: Mathematics 427K or the equivalent.

### **M E 382P. Topics in Experimental Thermal/Fluid Systems.**

Use of modern experimental techniques and instrumentation in the thermal/fluid sciences. Two lecture hours and three laboratory hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Advanced Experimental Methods for Thermal/Fluid Systems.** Design of experiments; fundamentals of electronic signal processing and optics; advanced experimental techniques, including flow measurements with laser-Doppler velocimetry, particle image velocimetry, and hot-wire anemometry; and thermal measurements with infrared cameras and thermocouples.

**Topic 2: Optics and Lasers.** Fundamentals of geometric and physical optics; interaction of light with matter; spectroscopy; and laser and electro-optics applications.

### **M E 382Q. Design of Thermal and Fluid Systems.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and Mechanical Engineering 339 or the equivalent.

**Topic 2: Solar Energy System Design.** Solar radiation, solar collectors, storage, and system analysis and design. Application to both thermal and photovoltaic systems.

**Topic 3: Advanced Thermo-Fluid Systems.** Project-based course addressing the design and analysis of systems in which thermal and fluid processes are central to function and performance. Advanced topics including transient system analysis, multicomponent nonreacting and reacting gas mixtures, phase change phenomena, and design principles based on entropy generation minimization are covered in the context of specific thermal-fluid applications.

**Topic 4: Energy Technology and Policy.** Multidisciplinary overview of energy technologies, fuels, environmental impacts, and public policies. Quantitative engineering analysis in energy, including the differences among fuels and energy technologies, the electricity sector, liquid fuels, conventional fuels, renewable fuels, impacts on the environment, basics of atmospheric chemistry, and water use for power plant cooling. Energy policy and the societal aspects of energy, such as culture, economics, war, and international affairs, are covered.

### **M E 382R. Topics in Combustion.**

Fundamentals of combustion science, technology, and engineering. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Fundamentals of Combustion.** Combustion phenomena are examined from a fundamental perspective. Topics include equilibrium phenomena, chemical kinetics, explosions, detonations, and premixed and diffusion flames. Additional prerequisite: Knowledge of computer programming or the use of public domain codes.

**Topic 2: Chemical Kinetics.** The theory of combustion chemistry. Issues include physics of molecular interactions, the explosion peninsula, elementary reaction schemes, reduced reaction schemes, and global chemistry.

**Topic 5: Advanced Combustion.** Presentation and analysis of multi-component and reacting conservation equations; examination of the theory of laminar flames (premixed and nonpremixed) using asymptotic methods; detailing of ignition and extinction phenomena; discussion of flame response to transport and flow modifications; and approaches to analyzing turbulent premixed and nonpremixed flames.

**Topic 6: Combustion Engine Processes.** Principles of internal combustion engines, fuels, carburetion, combustion, exhaust emissions, knock, fuel injection, and factors affecting performance.

### **M E 382T. Fire Science.**

Analysis of dynamics and consequences of fire in structures. Topics include combustion thermochemistry, premixed and diffusion flames, fluid mechanics of fire, human tenability in burning structures, computer modeling of fires. Three lecture hours a week for one semester. Mechanical Engineering 382R (Topic: Fire Science) and 382T may not both be counted. Prerequisite: Graduate standing, and Mechanical Engineering 326, 330, and 339, or their equivalents.

### **M E 383Q. Analysis of Mechanical Systems.**

Detailed studies in the characteristics of mechanical systems. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Vibrations.** Formulation of discrete and continuous models for mechanical systems in vibration; modal analysis; analytical solution methods for constant property linear systems; numerical solution methods.

**Topic 2: Dynamics of Mechanical Systems.** Advanced dynamics, including Newton-Euler, Lagrange, and Hamilton's principles; gyroscopic effects in mechanical systems; analysis of stability of systems; continuous bodies; introduction to Hamilton-Jacobi.

**Topic 4: Modeling of Physical Systems.** Development of models for mechanical, electrical, fluid, thermal, and chemical systems; circuit techniques; bond graphs; energy and variational methods; hardware examples.

**Topic 5: Wave Propagation.** Fundamentals of wave propagation; transverse waves on strings and membranes; compressional, torsional, and flexural waves in rods and plates; longitudinal, shear, and surface waves in elastic media; tube waves; and water waves.

**Topic 6: Fourier and Spectral Analysis in Dynamic Systems.** Fourier transformations (series, integrals, fast Fourier transforms) and their relationships. Sampling, aliasing, convolution, correlation, leakage, windowing, power spectra, frequency response functions, and coherence functions in one-dimensional digital signal processing. Cepstrum analysis, Hilbert transforms. Experimental techniques and applications include modal analysis, mechanical signature analysis, and path identification. Additional prerequisite: Consent of instructor.

**Topic 8: Digital Signal Processing.** Sampling and quantizing processes; analog/digital and digital/analog conversion; digital Fourier analysis, including fast Fourier transform; z transform; design of finite impulse response and infinite impulse response digital filters.

**Topic 9: Applied Intelligence for Engineers.** Fundamental concepts of artificial neural systems; architecture, paradigms, topology, and learning algorithms. Introduction to the most popular networks and to their selection for engineering applications.

**Topic 10: Modeling and Simulations of Multienergy Systems.** Methods for modeling and simulation of multienergy systems. Detailed study of applications in electromechanical systems, fluid power, chemical and biological processes, optimal control, and other areas of interest to the class.

### **M E 383S. Lubrication, Wear, and Bearing Technology.**

Theory of friction and wear; design of bearing systems, including hydrodynamic, rheodynamic, and direct contact devices. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Friction and Wear of Materials.** Theories of friction, theories of wear (adhesion, delamination), pitting, spalling, fretting, and galvanic corrosion.

### **M E 384E. Electromechanics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Electromechanical Dynamics.** Same as Electrical Engineering 394 (Topic 10: Electromechanical Dynamics). Maxwell's equations and transient response of electrical machines.

**Topic 2: Design of Electrical Machines.** Same as Electrical Engineering 394 (Topic 11: Design of Electrical Machines). Electrical and mechanical design of electrical machines.

### **M E 384N. Acoustics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Acoustics I.** Same as Electrical Engineering 384N (Topic 1: Acoustics I). Plane waves in fluids; transient and steady-state reflection and transmission; lumped elements; refraction; strings, membranes, and rooms; horns; ray acoustics; absorption and dispersion.

**Topic 2: Acoustics II.** Same as Electrical Engineering 384N (Topic 2: Acoustics II). Spherical and cylindrical waves, radiation and scattering, multipole expansions, Green's functions, waveguides, sound beams, Fourier acoustics, Kirchhoff theory of diffraction, and arrays.

**Topic 3: Electromechanical Transducers.** Same as Electrical Engineering 384N (Topic 3: Electromechanical Transducers). Modeling, analysis, and design of transducers for reception and transmission of acoustic and vibration signals; dynamics of coupled electrical, mechanical, and acoustical systems; and the effects of transducer characteristics on fidelity and efficiency of transduction.

**Topic 4: Nonlinear Acoustics.** Same as Electrical Engineering 384N (Topic 4: Nonlinear Acoustics). Waveform distortion and shock formation, harmonic generation and spectral interactions, effects of absorption and dispersion, parametric arrays, Rankine-Hugoniot relations, weak shock theory, numerical modeling, radiation pressure, and acoustic streaming.

**Topic 5: Underwater Acoustics.** Same as Electrical Engineering 384N (Topic 5: Underwater Acoustics). Acoustical properties of the ocean; point sources and Green's functions; reflection phenomena; ray theory; normal mode theory; guided waves in horizontally stratified fluid media; WKB and parabolic approximations.

**Topic 6: Architectural Acoustics.** Same as Electrical Engineering 384N (Topic 6: Architectural Acoustics). Human perception of sound, principles of room acoustics, sound-absorptive materials, transmission between rooms, and acoustical design of enclosed spaces.

**Topic 7: Ultrasonics.** Same as Electrical Engineering 384N (Topic 7: Ultrasonics). Acoustic wave propagation in fluids, elastic solids, and tissue; transducers, arrays, and beamforming; nondestructive evaluation; and acoustical imaging.

### **M E 384Q. Design of Control Systems.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and Mechanical Engineering 364L or the equivalent.

**Topic 1: Introduction to Modern Control.** State variable methods, eigenvalues, and response modes; controllability, observability, and stability; calculus of variations; optimal control; Pontryagin maximum principle; control of regulator and tracking servomechanisms; Hamilton-Jacobi, dynamic programming; deterministic observers, Kalman filter; discrete and continuous time.

**Topic 2: Nonlinear Control Systems.** State space formulation; stability criteria; Liapunov functions; describing functions; signal stabilization; Popov and circle criteria for design.

**Topic 3: Time-Series Modeling, Analysis, and Control.** Same as Operations Research and Industrial Engineering 390R (Topic 3: Time-Series Modeling, Analysis, and Control). Methods for analytical modeling, analysis, prediction, and control of linear, stationary time series. Includes examples of advanced research in nonstationary time-series modeling and applications in manufacturing, financial engineering, geosciences, and other areas. Students complete a project on a topic of their choice. Additional prerequisite: Graduate standing, and Mechanical Engineering 364L or the equivalent, an undergraduate calculus-based course in probability and statistics or consent of instructor.

**Topic 7: Stochastic Systems, Estimation, and Control.** Probability and random variables; filtering theory; stochastic calculus; stochastic control; engineering applications; linear and nonlinear systems; spectral techniques.

### **M E 384R. Robotics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Robotics and Automation.** Component technologies for precision machines based on dynamic modeling and motion programming: cams, linkages, planar manipulators.

**Topic 2: Design of Smart Mechanisms.** Design of reprogrammable multiple-degree-of-freedom architectures. The course addresses various mechanical configurations and stresses the integrated design approach to sensing/actuation/control architecture and control software. Includes design project.

**Topic 3: Advanced Dynamics of Robotic Systems.** Treatment in depth of the dynamics of robotic systems. Discussion of modeling, analysis, and control of conventional serial robots, in-parallel manipulators, dual arms, and legged locomotion systems.

**Topic 4: Geometry of Mechanisms and Robots.** Advanced topics in theoretical kinematics geometry: applications of screw system theory to the study of motion and force fields in spatial mechanisms and robotic systems; analytical and numerical schemes associated with kinematics geometry.

**Topic 5: Planar Mechanism Synthesis.** Design of planar mechanisms for applications that require rigid body guidance, function generation, and path generation. Graphical and analytical techniques. Computer-aided design projects.

### **M E 385J. Topics in Biomedical Engineering.**

Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in engineering and consent of instructor.

**Topic 1: Cell and Tissue Anatomy and Physiology for Engineers.** An overview of cellular biology, including functional cellular anatomy, DNA replication and the cell cycle, protein synthesis, membrane structure and function, energy metabolism, cellular homeostasis, and cell repair and death; and functional anatomy and physiology of the basic tissues. Normally offered in the fall semester only.

**Topic 2: Organ System Anatomy, Physiology, and Pathology for Engineers.** The functional anatomy and physiology of the major human organ systems; representative pathologic disorders associated with these organs. An overview of general pathologic processes, with emphasis on the influences of normal and abnormal organ anatomy, physiology, and disease on the definition and solution of biomedical engineering problems. Two lecture hours and one three-hour laboratory a week for one semester. Normally offered in the spring semester only. Additional prerequisite: Mechanical Engineering 385J (Topic 1) or the equivalent.

**Topic 3: Bioelectric Phenomena.** Examines the physiological bases of bioelectricity and the techniques required to record bioelectric phenomena both intracellularly and extracellularly; the representation

of bioelectric activity by equivalent dipoles and the volume conductor fields produced. Normally offered in the fall semester only.

**Topic 5: Cardiovascular Dynamics.** Anatomy, physiology, pathophysiology, and dynamics of the cardiovascular system, with emphasis on the design and application of electrical and mechanical devices for cardiac intervention. Normally offered in the fall semester only.

**Topic 9: Laser-Tissue Interaction: Thermal.** The thermal response of random media in interaction with laser irradiation. Calculation of the rate of heat production caused by direct absorption of the laser light, thermal damage, and ablation. Normally offered in the spring semester only.

**Topic 10: Biomedical Application of Transport Phenomena.** Investigates radioisotopic methods for biological transport, including theory and experiments. Investigates artificial organ systems with clinical laboratory experiments to augment theory presented in lectures.

**Topic 11: Biomedical Engineering Hospital Interfaces.** Students gain firsthand knowledge of the instrumentation, procedures, and organization of a modern hospital. Class sessions are held in the different clinical services and laboratories of the hospital. Normally offered in the spring semester only.

**Topic 12: Biomedical Heat Transfer.** Heat transfer in biological tissue; determination of thermodynamic and transport properties of tissue; thermal effects of blood perfusion; cryobiology; numerical modeling methods; clinical applications. Normally offered in the fall semester only. Additional prerequisite: Mechanical Engineering 339, Chemical Engineering 353, or the equivalent.

**Topic 13: Molecular Recognition in Biology and Biotechnology.**

**Topic 15: Biosignal Analysis.** Theory and classification of biological signals such as EEG, EKG, and EMG. Data acquisition and analysis procedures for biological signals, including computer applications. Normally offered in the spring semester only.

**Topic 16: Laser-Tissue Interaction: Optical.** The optical behavior of random media such as tissue in interaction with laser irradiation. Approximate transport equation methods to predict the absorption and scattering parameters of laser light inside tissue. Port-wine stain treatment; cancer treatment by photochemotherapy; and cardiovascular applications. Normally offered in the fall semester only.

**Topic 17: Biomedical Instrumentation II: Real-Time Computer-Based Systems.** Design, testing, patient safety, electrical noise, biomedical measurement transducers, therapeutics, instrumentation electronics, and microcomputer interfaces. Several case studies are presented. Four structured laboratories and an individual project laboratory. Normally offered in the fall semester only.

**Topic 18: Biomedical Image Processing.** Physical principles and signal processing techniques used in thermographic, ultrasonic, and radiographic imaging, including image reconstruction from projections such as CT scanning, MRI, and millimeter wave determination of temperature profiles. Normally offered in the spring semester only. Additional prerequisite: Electrical Engineering 371R.

**Topic 20: Network Thermodynamics in Biophysics.** Modeling and simulation methods for nonlinear biological processes, including coupling across multienergy domains; practical implementation by bond graph techniques. Normally offered in the spring semester only. Additional prerequisite: Mechanical Engineering 344 or consent of instructor.

**Topic 22: Musculoskeletal Biomechanics.** Synthesis of properties of the musculotendon and skeletal systems to construct detailed computer models that quantify human performance and muscular coordination. Additional prerequisite for kinesiology students: Mathematics 341 and Kinesiology 395 (Topic 36: Biomechanics of Human Movement).

**Topic 23: Optical Spectroscopy.** Measurement and interpretation of spectra: steady-state and time-resolved absorption, fluorescence,

phosphorescence, and Raman spectroscopy in the ultraviolet, visible, and infrared portions of the spectrum. Normally offered in the fall semester only.

**Topic 26: Therapeutic Heating.** Engineering aspects of electromagnetic fields that have therapeutic applications: diathermy (short wave, microwave, and ultrasound), electrosurgery (thermal damage processes), stimulation of excitable tissue, and electrical safety. Normally offered in the spring semester only.

**Topic 27: The Biotechnology Revolution and Engineering Ethics.** The history and status of genetic engineering; potential applications in medicine, agriculture, and industry; ethical and social issues surrounding the engineering of biological organisms; ethics in engineering practice in physical and biological realms. Normally offered in the spring semester only.

**Topic 28: Noninvasive Optical Tomography.** Basic principles of optical tomographic imaging of biological materials for diagnostic or therapeutic applications. Optical-based tomographic imaging techniques including photothermal, photoacoustic, and coherent methodologies.

**Topic 29: Transport Processes in Biological Systems.** Introduction to engineering analysis of transport phenomena in living systems, including fluid flow, heat transfer, pharmacokinetics, and membrane fluxes with clinical applications.

**Topic 30: Introduction to Biomechanics.** Modeling and simulation of human movement; neuromuscular control; computer applications; introduction to experimental techniques. Three lecture hours and one laboratory hour a week for one semester.

**Topic 31: Biomedical Instrumentation I.** Application of electrical engineering techniques to analysis and instrumentation in biological sciences: pressure, flow, temperature measurement; bioelectrical signals; pacemakers; ultrasonics; electrical safety; electrotherapeutics.

**Topic 32: Projects in Biomedical Engineering.** An in-depth examination of selected topics, such as optical and thermal properties of laser interaction with tissue; measurement of perfusion in the microvascular system; diagnostic imaging; interaction of living systems with electromagnetic fields; robotic surgical tools; ophthalmic instrumentation; noninvasive cardiovascular measurements. Three lecture hours and six laboratory hours a week for one semester. Additional prerequisite: Mechanical Engineering 385J (Topic 31).

**Topic 33: Neurophysiology/Prosthesis Design.** The structure and function of the human brain. Discussion of selected neurological diseases in conjunction with normal neurophysiology. Study of neuroprosthesis treatments and design philosophy, functional neural stimulation, and functional muscular stimulation. Normally offered in the fall semester only.

**Topic 34: Biopolymers and Drug/Gene Delivery.** Introduction to different classes of biopolymers. Biodegradability and biocompatibility. Interaction of cells and tissues with polymers and polymeric implants; immunology of biomaterials. Applications of polymers in medicine and biology. Gene therapy and generic immunization. The use of biopolymers and drug/gene delivery in organ regeneration and tissue engineering. Normally offered in the fall semester only.

**Topic 35: Rehabilitation Robotics and Engineering.** Explores the use of robotic devices to support the strength of patients and therapists, quantitatively diagnose impairment, and augment function. Critically review the literature in rehabilitation engineering from both robotics and scientific perspectives. Students also shadow therapists and develop a prototype of a device for therapy, assistance or diagnosis of patients, or conduct an experiment to test a hypothesis in the field using a device.



### **M E 386P. Materials Science: Fundamentals.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Introduction to Phase Transformations.** Basics of crystal structures and phase diagrams; diffusion; solidification; solid-state phase transformations.

**Topic 2: Mechanical Behavior of Materials.** Elastic deformation; viscoelasticity; yielding, plastic flow, plastic instability; strengthening mechanisms; fracture, fatigue, creep; significance of mechanical properties tests. Microstructural mechanisms and macroscopic behavior of metals, polymers, ceramics, and composites.

**Topic 3: Introduction to Thermodynamics of Materials.** Thermodynamic properties; reactions and chemical equilibrium in gases; solutions, phase equilibria, phase diagrams, reaction equilibria; surfaces and interfaces; point defects in crystals.

**Topic 4: Introduction to Solid-State Properties of Materials.** Same as Electrical Engineering 396V (Topic 5: Introduction to Solid-State Properties of Materials). Introduction to the electronic, magnetic, and optical properties of materials. Solid-state properties of metals, semiconductors, and ceramics; fundamental concepts needed for the description of these properties, using an introductory-level description of the electronic structure of solids.

**Topic 5: Structure of Materials.** Essential crystallography of lattices and structures; symmetry; elements of diffraction and reciprocal lattices; point, line, and surface defects in crystals; crystalline interfaces; noncrystalline materials; polymers; glasses.

**Topic 6: Kinetic Processes in Materials.** Review of irreversible thermodynamics and rate of entropy production to define the equilibrium state of a system; derivation of mathematical expressions to describe relaxation from a constrained state to equilibrium; diffusional processes in materials; calculation of diffusion coefficients from solid-state properties; dislocations and interfaces; kinetics of phase transformations.

### **M E 386Q. Materials Science: Structure and Properties.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Theory of Materials.** Periodic behavior and the periodic table; historical approach to the principles of crystal structure; complex alloy phases; some aspects of phase stability.

**Topic 2: Phase Diagrams.** Phase equilibria in materials systems; systematic treatment of unary, binary, and ternary phase diagrams.

**Topic 3: Fracture of Structural Materials.** Microscopic and macroscopic aspects of ductile and brittle fracture; fracture mechanisms and fracture prevention.

**Topic 4: Physical Metallurgy of Steels.** The iron-carbon system; transformations and structures of steels; properties of pearlite, bainite, and martensite; tempering; hardenability and the effect of alloying elements.

**Topic 7: Composite Materials.** The theory of structural composite materials, their physical and mechanical properties; processing associated with metal-ceramic-polymer composites. Additional prerequisite: Mechanical Engineering 260K (or 360K) or the equivalent, Mechanical Engineering 378K or the equivalent, or consent of instructor.

**Topic 9: Crystalline and Composite Anisotropy.** Mathematical analysis of anisotropic materials, including single crystals, laminate composites, and deformation-hardened metals. Topics include thermal and electrical conductivity, diffusivity, thermal expansion, elasticity, and yielding.

**Topic 10: High-Temperature Materials.** Theory and practice in use of materials for high-temperature structural applications; case-study considerations of actual problems and requirements; interactive process-microstructure-property relationships in materials development and applications of superalloys, intermetallics, composites, and ceramics; prospective trends.

**Topic 11: Electroceramics.** Bonding; crystal structures; defects; phase diagrams; glass ceramics; electrical, dielectric, magnetic, and optical ceramics.

**Topic 13: Mechanical Behavior of Ceramics.** Microstructure-mechanical property relationships in ceramics; principles of fracture mechanics, and static and dynamic fracture; static and cyclic fatigue; high-temperature behavior; strengthening and toughening mechanisms in monolithic ceramics; and particulate and fibrous ceramic composites.

**Topic 14: Electrochemical Energy Materials.** Electrochemical cells; principles of electrochemical power sources; materials for rechargeable and nonrechargeable batteries, fuel cells, and electrochemical capacitors.

### **M E 386R. Materials Science: Physical and Electronic Properties.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Localized versus Itinerant Electrons in Solids.** Same as Electrical Engineering 396K (Topic 9: Localized versus Itinerant Electrons in Solids). Description of electrons, from free atoms to crystals; band theory contrasted with crystal-field theory; evolution of electronic properties on passing from magnetic insulators to normal metals, from ionic to covalent solids, from single-valent compounds to mixed-valent systems; electron-lattice interactions and phase transitions; many examples. Additional prerequisite: A semester of quantum mechanics and a semester of solid-state science or technology.

**Topic 2: Localized-Electron Phenomena.** Same as Electrical Engineering 396K (Topic 17: Localized-Electron Phenomena). Analysis of the variation in physical properties versus chemical composition of several groups of isostructural transition-metal compounds. Additional prerequisite: A semester of solid-state science and/or quantum mechanics.

**Topic 3: Transport Properties of Transition-Metal Oxides.** Electronic and ionic transport in transition-metal oxides as they relate to battery cathodes, solid oxide cells, spin electronics, thermistors, and high-temperature superconductors.

### **M E 386S. Materials Science: Microelectronics and Thin Films.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Thin Films and Interfaces.** Application of thin films and interfaces in microelectronics; basic properties, deposition techniques, microstructures and defects, diffusion characteristics; materials reaction in thin films and at interfaces.

**Topic 2: Metallization and Packaging.** Technology requirements and trends, impact of device scaling, multilayered interconnect structures, Schottky and ohmic contacts, contact reactions, silicide properties and applications, electromigration, thermal/mechanical properties, reliability. Additional prerequisite: Mechanical Engineering 386S (Topic 1).

### **M E 386T. Materials Science: The Design of Technical Materials.**

The process of designing a material for a specific engineering function as illustrated for various materials. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Ionic Conductors.** Same as Electrical Engineering 396K (Topic 10: Ionic Conductors).

**Topic 2: High-Temperature Superconductors.** Same as Electrical Engineering 396K (Topic 11: High-Temperature Superconductors).

**Topic 3: Catalytic Electrodes.** Same as Electrical Engineering 396K (Topic 12: Catalytic Electrodes).

**Topic 4: Magnetic Materials.** Same as Electrical Engineering 396K (Topic 13: Magnetic Materials).

### **M E 387Q. Materials Science: Thermodynamics and Kinetics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Diffusion in Solids.** Atomic mechanisms and phenomenological basis for transport by diffusion.

**Topic 2: Kinetics and Phase Transformations.** Nucleation and growth, spinodal decomposition, transformations in alloy systems.

**Topic 3: Solidification.** Liquid to solid transformations in pure materials, alloys and eutectics; applications such as zone refining, composites, and castings.

**Topic 4: Corrosion.** Electrode kinetics and the theory of polarization, passivity, galvanic coupling, and high temperature oxidation.

**Topic 5: Thermodynamics of Materials.** First and second laws, fugacity, activity, chemical equilibrium, phase diagrams, and introductory statistical concepts.

**Topic 6: Statistical Thermodynamics of Materials.** Quantum mechanics applied to partition functions of condensed and gaseous phases; chemical equilibria; phase transitions; and lattice statistics including the Ising model.

**Topic 7: Group Theory and Phase Transformations.** Symmetry principles and the associated mathematics applied to the description of condensed phases and their transformations.

### **M E 387R. Materials Science: Experimental Techniques.**

Three lecture hours a week for one semester. Some topics may require additional laboratory hours; these are identified in the Course Schedule. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Nondestructive Testing.** Acoustic emission, ultrasonic, eddy current, dye penetrant, and magnetic methods.

**Topic 3: Electron Diffraction and Microscopy.** Transmission electron microscopy, kinematic electron diffraction theory, reciprocal lattice, defect analyses, scanning electron microscopy.

**Topic 4: Advanced Electron Microscopy Theory and Techniques.** Scanning transmission electron microscopy, microanalysis techniques, dynamical diffraction theory, convergent beam diffraction.

**Topic 5: Materials Characterization Techniques.** Classification and selection of characterization techniques: principles and applications of diffraction, spectroscopic, quantitative chemical analysis, thermal analysis, and transport and magnetic measurement techniques.

**Topic 6: High-Resolution Transmission Electron Microscopy Techniques.** Theory and practice of high-resolution phase contrast electron microscopy. Computer simulation of images and diffraction patterns.

**Topic 7: Scanning Electron Microscopy.** Theory and practice of scanning electron microscopy; image formation, elemental analysis,

sample preparation, and electron-sample interactions. Three lecture hours and two laboratory hours a week for one semester.

**Topic 8: Practical Electron Microscopy.** Principles, operation, and techniques of transmission electron microscopy; acquiring and interpreting imaging, diffraction, and spectroscopy information; and hands-on experience with a transmission electron microscope. Three lecture hours and three laboratory hours a week for one semester.

### **M E 387S. Materials Processing.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 2: Processing of Materials.** Principles, advantages, and problems of solid, liquid, and vapor materials processes; considerations of structural alloys, ceramics, engineering polymers, and composites.

**Topic 3: Powder Processing.** Synthesis of powders, powder characterization, powder stabilization, consolidation of powders, sintering, densification, and grain growth.

### **M E 388C. Nuclear Power Engineering.**

Fundamental principles of the design and analysis of nuclear systems; introduction to the physics of nuclear reactions, chain reactions, and nuclear energy generation; heat generation and conduction within nuclear systems; heat transfer and fluid flow in nuclear systems; the thermodynamics of nuclear power; the nuclear fuel cycle; and issues related to the materials aspect of reactor engineering. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **M E 388D. Nuclear Reactor Theory I.**

Principle concepts in the physics of nuclear systems, including radiation, radioactive decay, and the buildup and depletion of isotopes in nuclear systems; neutron-nucleus interactions and nuclear cross sections; transport or radiation using one-group and two-group diffusion theory; and concepts of criticality and time dependent reactors. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Mechanical Engineering 361E or the equivalent.

### **M E 388E. Nuclear Reactor Theory II.**

Neutron-nucleus interactions and nuclear cross section calculations; transport of radiation using neutron transport theory and multigroup diffusion theory; heterogeneous reactor calculations; the kinetics of nuclear systems; perturbation theory; and the nuclear fuel cycle. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Mechanical Engineering 361E or the equivalent.

### **M E 388F. Computational Methods in Radiation Transport.**

Transport equation, Monte Carlo method, energy and time discretization, discrete ordinates, integral methods, and even-parity methods. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **M E 388G. Nuclear Radiation Shielding.**

Radiation fields/sources; techniques in neutron and photon attenuation; transport description of radiation penetration. Three lecture hours a week for one semester. Mechanical Engineering 388G and 388R (Topic 1: Nuclear Radiation Shielding) may not both be counted. Prerequisite: Graduate standing.

### **M E 388H. Nuclear Safety and Security.**

Same as Operations Research and Industrial Engineering 390R (Topic 15: Nuclear Safety and Security). Probabilistic risk assessment models and nuclear arms nonproliferation, including failure classifications; failure mode, effects, and criticality analysis (FMECA); fault and event trees; and reliability block diagrams. Discussion of specific areas from the Code

of Federal Regulations. Three lecture hours a week for one semester. Only one of the following may be counted: Mechanical Engineering 337G, 388H, Operations Research and Industrial Engineering 390R (Topic 15). Prerequisite: Graduate standing, and an undergraduate calculus-based course in probability and statistics or consent of instructor.

### **M E 388J. Neutron Interactions and Their Applications in Nuclear Science and Engineering.**

The fundamental principles of neutron interactions with matter and how these interactions are used in a variety of science and engineering research areas. Includes the history of neutron research, fundamental principles, dosimetry, depth profile, radiography, activation analysis, detection, homeland security, and scattering, with a significant emphasis placed on experimental design of these neutron techniques. Three lecture hours a week for one semester. Mechanical Engineering 388J and 397 (Topic: Neutron Interactions and Their Applications in Nuclear Science and Engineering) may not both be counted. Prerequisite: Graduate standing.

### **M E 388M. Mathematical Methods for Nuclear and Radiation Engineering.**

Fundamental mathematics used in graduate studies in nuclear and radiation engineering. Topics include statistics, experimental data, propagation of error, detection limits, and differential and partial differential equations. Three lecture hours a week for one semester. Only one of the following may be counted: Mechanical Engineering 388M, 388Q (Topic 5: Mathematical Methods for Nuclear and Radiation Engineering), 397 (Topic: Mathematical Methods for Nuclear and Radiation Engineering). Prerequisite: Graduate standing.

### **M E 388N. Design of Nuclear Systems.**

Integration of fluid mechanics, heat transfer, thermomechanics, and thermodynamics with reactor theory for core design. Three lecture hours a week for one semester. Mechanical Engineering 388N and 389Q (Topic 1: Design of Nuclear Systems) may not both be counted. Prerequisite: Graduate standing, and Mechanical Engineering 361E or the equivalent.

### **M E 388P. Applied Nuclear Physics.**

Properties of the nucleus and its structure; binding energy and nuclear stability, and the liquid drop model of the nucleus; the shell model of the nucleus; deuteron bound-state wave function and energy, n-p scattering cross section, transition probability per unit time, and barrier transmission probability; nuclear conservation laws; the energetics and general cross section behavior in nuclear reactions; interactions of charged particles, neutrons, and gamma rays with matter; and alpha, beta, and gamma decay. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **M E 389C. Nuclear Environmental Protection.**

Ionizing radiation and its interactions with matter and living tissues; radioactive decay kinetics; external and internal dose measurement; transportation through the environment; managing radioactive waste streams; and safeguards. Three lecture hours a week for one semester. May not be counted by students with credit for Mechanical Engineering 389D and 389E. Mechanical Engineering 337F and 389C may not both be counted. Prerequisite: Graduate standing.

### **M E 389F. The Nuclear Fuel Cycle.**

A survey of the nuclear fuel cycle, including resource acquisition, fuel enrichment and fabrication, spent fuel reprocessing and repository disposal. Nuclear fuel management and reactor physics are addressed in the context of fuel burn-up calculations. Uses cross-disciplinary tools such as cost-benefit and environmental impact analyses. Includes fuel cycles currently in use, advanced fuel cycle concepts currently being presented in the technical literature, and a group project designed to research,

analyze, and document the technical, economic, and/or environmental ramifications of one of these advanced fuel cycles. Three lecture hours a week for one semester. Mechanical Engineering 389F and 397 (Topic: The Nuclear Fuel Cycle) may not both be counted. Prerequisite: Graduate standing.

### **M E 389Q. Nuclear and Radiation Engineering: Design of Systems.**

Synthesis of engineering concepts, materials specifications, and economics in the design of nuclear systems. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and Mechanical Engineering 361E or the equivalent.

### **M E 390. Vehicle System Dynamics and Controls.**

Fundamentals of ground vehicle dynamics, tire-road mechanics, vehicle control systems, vehicle stability, and simulation of vehicle systems. Three lecture hours a week for one semester. Only one of the following may be counted: Mechanical Engineering 360, 379M (Topic: Vehicle System Dynamics and Controls), 390, 397 (Topic: Vehicle System Dynamics and Controls). Prerequisite: Graduate standing.

### **M E 390C. Cyber Vehicle Systems.**

Study of the engineering principles of autonomous mobile robots. Subjects include understanding the dynamics of vehicle systems, and the principles and practical implementation of sensing, actuation, and control. Emphasis will be given to providing practical laboratory study of these subjects using mobile robot platforms, and the use of the commercial software package LabVIEW for programming of real-time data acquisition and control targets. Simulation studies may also be conducted in LabVIEW and/or the Matlab environment; some proficiency in use of both of these software packages is expected. Three lecture hours a week for one semester. Only one of the following may be counted: Mechanical Engineering 360, 379M (Topic: Cyber Vehicle Systems), 390, 397 (Topic: Cyber Vehicle Systems). Prerequisite: Graduate standing.

### **M E 390F. Nuclear Analysis Techniques.**

Thermal and fast neutron activation, scintillation and solid-state detectors, beta and gamma spectrometry, coincidence techniques. Two lecture hours and one and one-half laboratory hours a week for one semester. Mechanical Engineering 389R (Topic 2: Nuclear Analysis Techniques) and 390F may not both be counted. Prerequisite: Graduate standing.

### **M E 390G. Nuclear Engineering Laboratory.**

Experiments using the TRIGA reactor and a subcritical assembly; measurement of reactor characteristics and operational parameters. Two lecture hours and one and one-half laboratory hours a week for one semester. Mechanical Engineering 389R (Topic 1: Nuclear Engineering Laboratory) and 390G may not both be counted. Prerequisite: Graduate standing.

### **M E 390N. Health Physics Laboratory.**

The application of radiation and radiation protection instrumentation. Includes personnel monitoring; radiation detection systems; gamma-ray spectroscopy; determination of environmental radiation; counting statistics; and gamma and neutron shielding. One lecture hour and three laboratory hours a week for one semester. Prerequisite: Graduate standing.

### **M E 390T. Nuclear and Radiochemistry.**

Theory and application of nuclear and radiochemistry, including alpha, beta, and gamma ray processes; fission products; statistics; solvent extraction; absorption and teaching techniques; various counting

methods; and radiation protection. One lecture hour and three laboratory hours a week for one semester. Prerequisite: Graduate standing.

### **M E 391R. Artificial Intelligence Programming for Engineers.**

Provides a working knowledge of LISP and compares it with PROLOG; use of the Texas Instruments Explorer, and artificial intelligence techniques applied to engineering problems. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **M E 392C. Design Optimization and Automation.**

Optimization in mechanical design, including monotonicity analysis, gradient-based constrained optimization, tree-searching, and stochastic approaches. Three lecture hours a week for one semester. Prerequisite: Graduate standing and proficiency in C or MATLAB.

### **M E 392G. Computer Graphics and Computer-Aided Design.**

Studies in computer graphics and its application to design. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Introduction to Computer Graphics.** Two- and three-dimensional transformations, projections, and the graphics pipeline; fundamental algorithms for wire frame and hidden surface image generation; interactive techniques, geometric modeling, and realistic rendering using a standard graphics library. Additional prerequisite: Proficiency in C or C++.

**Topic 2: Computer-Aided Geometric Design.** Introduction to techniques for representing geometry for computer-aided engineering design. Two- and three-dimensional curve formulations, techniques from algebraic and vector geometry, implicit versus parametric definitions; and free-form surface formulation and solid modeling. Additional prerequisite: Proficiency in C or C++.

**Topic 3: Advanced Computer-Aided Design Applications.** Hardware and software for computer-aided design systems. Display devices, multidimensional graphics, optimization, use of artificial intelligence.

**Topic 4: Advanced Topics in Computer-Aided Design.** Detailed execution of an independent computer-aided design project. Projects require significant development and emphasize application of techniques from computer-aided engineering and interactive computer graphics. Lectures deal with the subject matter of the projects. Additional prerequisite: Mechanical Engineering 352K, 392G (Topic 1), or 392G (Topic 2); and consent of instructor.

### **M E 392M. Advanced Mechanical Design.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Analytical Techniques in Mechanical Design.** Analytical techniques and some computational techniques for the advanced stress and strength analysis of machine components and mechanical structures.

**Topic 3: Advanced Design of Machine Elements.** Review of basic machine elements, properties, and stresses; fluid couplings and torque converters; thermal stresses, relaxation, and beneficial residual stressing; shells and rotors; plasticity.

**Topic 6: Engineering Design Theory and Mathematical Techniques.** Design history and philosophy. Survey of current research areas in design theory, methodology, and manufacturing. Tools for solving engineering system design and synthesis problems. Reverse engineering design project.

**Topic 7: Product Design, Development, and Prototyping.** Methodology and tools for the product development process.

Functional designs based on real product needs. Product design project.

### **M E 392Q. Manufacturing.**

Topics that cut across departmental concentrations (mechanical systems and design, metallurgy and materials engineering, operations research and industrial engineering), including design for manufacturing, manufacturing machines and manufacturing processing, and production systems. Three lecture hours a week for one semester; additional laboratory hours may be required for some topics. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Introduction to Manufacturing Systems.** Analysis and design of production systems to decrease manufacturing costs, decrease defects, and shorten delivery time by reducing process cycle times. Emphasis is on continuous flow manufacturing. Additional prerequisite: A basic understanding of statistics.

**Topic 2: Computer Fundamentals for Manufacturing Systems.** Computer graphics, computer-aided design, direct numerical control, relationship between computer-aided design and manufacturing.

**Topic 4: Automation and Integration of Manufacturing Systems.** Integration of automated manufacturing components into a cohesive manufacturing system. Selection of automation strategy, communication and interaction between system components, economics and reliability of the resulting systems.

**Topic 5: Manufacturing Processing: Unit Processes.** Important unit processing operations in manufacturing: cutting, drilling, and grinding metals, ceramics, composites, and polymers. Deformation processes: forming and rolling. Laser machining.

**Topic 6: Mechatronics I.** Integrated use of mechanical, electrical, and computer systems for information processing and control of machines and devices. System modeling, electromechanics, sensors and actuators, basic electronics design, signal processing and conditioning, noise and its abatement, grounding and shielding, filters, and system interfacing techniques. Three lecture hours and two laboratory hours a week for one semester.

**Topic 7: Microcomputer Programming and Interfacing.** Microcomputer architecture and programming; microcomputer system analysis; interfacing and digital control.

**Topic 9: Mechatronics II.** Interfacing microcomputers with sensors and actuators; hybrid (analog/digital) design; digital logic and analog circuitry; data acquisition and control; microcomputer architecture, assembly language programming; signal conditioning, filters, analog-to-digital and digital-to-analog conversion. Three lecture hours and two laboratory hours a week for one semester.

**Topic 10: Statistical Methods in Manufacturing.** Same as Operations Research and Industrial Engineering 390Q (Topic 7: Statistical Methods in Manufacturing). Statistical monitoring of manufacturing processes; methods and applications of various control charts; formal design of experiments (DOE), including the statistical evaluation of main and interaction effects, as well as intelligent experimentation through reduced factorial experimental design; Taguchi's design philosophy as applied to response surface methods and gradient-based search techniques; and advanced issues in quality control and design of manufacturing systems. Additional prerequisite: Knowledge of basic probability and statistics and consent of instructor.

### **M E 395. The Enterprise of Technology.**

Studies the basis for assessing emerging technologies. Describes the process of technology commercialization, including identifying marketable technologies, defining products, and matching products to markets. Also studies intellectual property protection and strategy, and the steps and processes necessary to the successful design and manufacture of a product or service. Three lecture hours a week for one semester. Mechanical Engineering 395 and 397 (Topic: Enterprise of Technology:

Laboratory to Market) may not both be counted. Prerequisite: Graduate standing.

### **M E 396D. Decision and Control of Human-Centered Robots.**

Geared toward students who would like to use Python for their engineering careers with a focus on sharing and development of open source software applications. Emphasis on the important areas of system modeling, simulation, data analysis, and software/data management. Students create mini-projects in Python where they apply basic knowledge on software design and organization, debugging, open source practices, and data visualization. It is expected that students have some experience in programming and would like to advance to the next level. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### **M E 396P. Application Programming for Engineers.**

Designed for students who have some experience in programming and are interested in the sharing and development of open source software applications. Provides an introduction to the Python programming language, an open source, flexible, and intuitive debug programming language, with an emphasis on system modeling, simulation, data analysis, and software/data management. Students create mini projects in Python that demonstrate software design and organization, debugging, open source practices, and data visualization. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### **M E 397. Current Studies in Engineering.**

The equivalent of three class hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

**Topic 3: Facilitating Process Improvement.**

**Topic 8: Energy and the Environment.** Additional prerequisite: Consent of instructor.

### **M E 197K, 297K, 397K. Graduate Seminar.**

Normally required of all mechanical engineering graduate students. For each semester hour of credit earned, one lecture hour a week for one semester. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Acoustics Seminar.** Offered on the credit/no credit basis only. Additional prerequisite: Consent of instructor.

**Topic 2: Advanced Thermal/Fluid Seminar.** Offered on the credit/no credit basis only.

**Topic 3: Materials Engineering.** Offered on the credit/no credit basis only.

**Topic 4: Mechanical Systems and Design.** Offered on the credit/no credit basis only.

**Topic 5: Nuclear Engineering.** Offered on the credit/no credit basis only.

**Topic 6: Introductory Thermal/Fluid Seminar.** Offered on the credit/no credit basis only.

### **M E 397M. Graduate Research Internship.**

Research associated with enrollment in the Graduate Research Internship Program (GRIP). Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor and the dean of the Cockrell School of Engineering.

### **M E 197P, 297P, 397P. Projects in Mechanical Engineering.**

Independent project carried out under the supervision of a mechanical engineering faculty member. Three, six, or nine laboratory hours a

week for one semester. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **M E 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in mechanical engineering and consent of the graduate adviser; for 698B, Mechanical Engineering 698A.

### **M E 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in mechanical engineering and consent of the graduate adviser.

### **M E 398T. Supervised Teaching in Mechanical Engineering.**

Teaching under close supervision, group meetings or individual consultations, and reports as required. Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and appointment as a teaching assistant.

### **M E 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **M E 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Mechanical Engineering 399R, 699R, or 999R.

## **Operations Research and Industrial Engineering**

*Master of Science in Engineering  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Engineering Teaching Center II (ETC) 5.202, phone (512) 471-1336, fax (512) 471-8727; campus mail code: C2200

**Mailing address:** The University of Texas at Austin, Operations Research and Industrial Engineering Program, Department of Mechanical Engineering, 204 E Dean Keeton Street Stop C2200, Austin TX 78712

**E-mail:** [orie@me.utexas.edu](mailto:orie@me.utexas.edu)

**URL:** <http://www.me.utexas.edu/areas/orie/>

### **Objectives**

Operations research is a mathematical science concerned with optimal decision making and the modeling of deterministic and probabilistic systems. Its focus and field of application are interdisciplinary, embracing a broad range of quantitative techniques. Industrial engineering is concerned with the design, improvement, and installation of integrated systems of personnel, material, and equipment. Together, operations research and industrial engineering provide a rational approach to engineering and managerial problem solving through the deliberate application of scientific methods.

In practice, operations research and industrial engineering address both the performance objectives and the resource constraints of an organization, working toward the establishment of policies that are most beneficial to the organization as a whole. The function of the operations research analyst or the industrial engineer is to guide decision making

by identifying underlying cause-and-effect relationships, developing and proposing courses of action, establishing criteria by which to judge their effectiveness, and evaluating their probable effects. The program in operations research and industrial engineering is designed to allow students to develop the technical, analytic, and managerial skills necessary to perform these tasks successfully.

The principal goals of the program are to provide the student with the educational basis for continued learning and to impart the fundamental skills necessary to be a successful analyst. Students are expected to develop proficiency in one or more programming languages, expertise in mathematical modeling, and an understanding of the uses and limitations of commercial optimization and statistical software. The master's degree program balances theory and applications. At the doctoral level, the program's emphasis on research is intended to enable students to extend their field of knowledge and to develop the analytic techniques that will serve them in academic, industrial, or governmental careers.

## Areas of Study

The program in operations research and industrial engineering is designed to educate engineers who will solve complex industrial-socioeconomic problems by applying fundamental principles from engineering, mathematics, economics, computer science, and systems theory. In support of this end, a wide variety of research and study areas are offered by a faculty whose expertise covers such fields as optimization, simulation, statistics, stochastic processes, decision analysis, and manufacturing systems. The program is rigorous but sufficiently flexible to accommodate the needs and interests of most students.

Once a student chooses a study area, he or she works closely with one or more faculty members pursuing research in that area. Because of the interdisciplinary nature of the program, many projects involve teamwork and collaboration with departments in the Cockrell School of Engineering and the McCombs School of Business. Each student's program includes a balanced combination of coursework, seminars, computational analysis, and research. State-of-the-art computer facilities, specialized laboratories, and the latest versions of applications software are available to all graduate students.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Jonathan F Bard  
J Eric Bickel  
Ned Dimitrov  
Dragan Djurdjanovic

John J Hasenbein  
Aida Khajavirad  
Erhan Kutanoglu

## Admission Requirements

The Admission Committee uses the following policies in considering applicants for admission. Each application is reviewed on its merits.

1. Applicants must provide a Graduate Record Examinations General Test (GRE) score no more than five years old. The applicant should have a grade point average in upper-division undergraduate coursework of at least 3.20 on a 4-point scale, or the equivalent. Students who feel that their GRE scores and grades do not reflect their ability to do high-quality graduate work should submit a statement explaining this belief.
2. Both the master's and the doctoral degree program are designed for full-time study, but part-time students are accepted. From the time of entry until completion, students are expected to show evidence of commitment to the program and of progress toward the degree.

3. As a general rule, students should enter the program in the fall semester, because of the way basic graduate courses are scheduled.
4. Students who do not have undergraduate degrees in engineering, mathematics, or the sciences may be required to remove deficiencies before beginning graduate coursework.

## Degree Requirements

### Master of Science in Engineering

To enter the MSE program, a student should have an undergraduate degree in engineering or an equivalent quantitative field such as mathematics, economics, or one of the physical sciences. The graduate adviser may require those with degrees in other fields to take additional courses. In general, an adequate background includes coursework in probability, statistics, computer programming, linear algebra, calculus, engineering economics, and optimization. These courses may be taken after enrollment, but they usually will not be counted toward fulfillment of degree requirements.

The operations research component of the program emphasizes the application of mathematics to a variety of economic and operational problems. Students take advanced coursework in optimization, probability and statistics, and stochastic processes. Those interested primarily in industrial engineering may concentrate on forecasting, project management, production planning and control, scheduling, or reliability. Each student must complete either twenty-four semester hours of coursework, plus a thesis; twenty-seven semester hours of coursework, plus a report; or thirty hours of coursework. More coursework may be required, depending on the student's background and goals. All options require at least two courses in a minor area, which usually comprises work in mathematics, business, computer science, or other branches of engineering.

### Doctor of Philosophy

The chief components of this program are scholastic excellence and original research. Although there is no specific number of semester hours required for the doctoral program, the student must meet the requirements of the Graduate Studies Committee. He or she usually completes twenty-four to thirty-six semester hours of graduate coursework beyond the master's degree. Formal admission to candidacy is considered by the Graduate Studies Committee after a thorough review of the student's overall academic record and performance on the doctoral qualifying examination.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Operations Research and Industrial Engineering: ORI

#### ORI 180M, 280M, 380M, 680M, 980M. Research.

May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in operations research and industrial engineering.

### **ORI 381. Deterministic Methods for Operations Research.**

Theory and algorithms for deterministic operations research methods. Algorithms for solving linear, integer, and nonlinear optimization models. Three lecture hours a week for one semester. May not be counted toward a degree in operations research and industrial engineering. Prerequisite: Graduate standing.

### **ORI 382. Stochastic Methods for Operations Research.**

Theory and algorithms for stochastic operations research methods. Algorithms related to stochastic processes: Markov chain analysis; queueing theory; stochastic inventory theory and decision analysis. Three lecture hours a week for one semester. May not be counted toward a degree in operations research and industrial engineering. Prerequisite: Graduate standing and Mechanical Engineering 335 or the equivalent.

### **ORI 390Q. Industrial Engineering.**

Industrial engineering techniques for quantitative solution of contemporary systems and management problems. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Project Management.** Methods for organizing, coordinating, and controlling resources to minimize risk and conflict and to maintain budgets and schedules. Topics include evaluation of competing alternatives, organization of a project, scheduling of tasks and resources, and the role of management over time.

**Topic 2: Production and Inventory Control.** Issues in inventory control with known and unknown demand, materials requirement planning, just-in-time, pull control systems, operations scheduling, dispatching and aggregate planning, and the basic dynamics of production and inventory control.

**Topic 3: Facility Layout and Location.** Layout of operations within a facility, design of the material flow, choice of flexible manufacturing systems and/or cellular manufacturing, location of facilities within a geographic region, and distribution using mathematical models and optimization.

**Topic 4: Modeling and Analysis of Manufacturing Systems.** Applications of analysis to manufacturing processes, using mathematical models, optimization, and stochastic analysis. Economic evaluation, identification of bottlenecks, estimation of resources requirements, and system design.

**Topic 5: Scheduling Theory and Applications.** Modeling, analysis, and solution techniques for production and service scheduling problems, machine scheduling in deterministic and stochastic settings, exact and heuristic algorithms, and industrial applications, including semiconductor manufacturing and airlines applications. Additional prerequisite: Operations Research and Industrial Engineering 391Q (Topic 4: Integer Programming) or the equivalent.

**Topic 6: Multicriteria Decision Making.** Techniques for problems involving more than one criterion measured on incommensurate scales, such as dollars, reliability, and quality of life. Topics include methods for generating nondominated solutions, interactive procedures for continuous problems, goal programming, multi-attribute utility theory, and the analytic hierarchy process.

**Topic 7: Statistical Methods in Manufacturing.** Same as Mechanical Engineering 392Q (Topic 10: Statistical Methods in Manufacturing). Statistical monitoring of manufacturing processes; methods and applications of various control charts; formal design of experiments (DOE), including the statistical evaluation of main and interaction effects, as well as intelligent experimentation through reduced factorial experimental design; Taguchi's design philosophy as applied to response surface methods and gradient-based search techniques; and advanced issues in quality control and design of manufacturing

systems. Additional prerequisite: Knowledge of basic probability and statistics and consent of instructor.

### **ORI 390R. Statistics and Probability.**

Concepts of probability and mathematical statistics; application of these analytical methods to planning and evaluation of research and industrial experimentation. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and an undergraduate calculus-based course in probability and statistics or consent of instructor.

**Topic 1: Applied Probability.** Basic probability theory, combinatorial analysis of random phenomena, conditional probability and independence, parametric families of distributions, expectation, distribution of functions of random variables, limit theorems.

**Topic 2: Mathematical Statistics.** Sampling distributions, properties of estimators, point and interval estimation, hypothesis testing, introduction to multivariate and nonparametric statistics.

**Topic 3: Time-Series Modeling, Analysis, and Control.** Same as Mechanical Engineering 384Q (Topic 3: Time-Series Modeling, Analysis, and Control). Methods for analytical modeling, analysis, prediction, and control of linear, stationary time series. Includes examples of advanced research in nonstationary time-series modeling and applications in manufacturing, financial engineering, geosciences, and other areas. Students complete a project on a topic of their choice. Additional prerequisite: Graduate standing, Mechanical Engineering 364L or the equivalent, an undergraduate calculus-based course in probability and statistics or consent of instructor.

**Topic 4: Reliability Theory and Modeling.** Theory of probabilistic and statistical models of aging elements, reliability, replacement, and repair maintenance, and their integration in surveillance, quality control, and manufacturing problems.

**Topic 5: Applied Stochastic Processes.** Poisson process, renewal theory, discrete and continuous-time Markov chains, queueing and reliability applications.

**Topic 6: Regression and Analysis of Variance.** Fitting equations to data; joint confidence regions; partial correlation analysis; general linear hypotheses; dummy variables; diagnostics and remedial measures; design of experiments; fixed, random, and mixed models; factorial and nested designs. Additional prerequisite: Operations Research and Industrial Engineering 390R (Topic 2) or consent of instructor.

**Topic 7: Statistical Techniques in Image Processing.** Statistical techniques for transformation, enhancement, restoration, segmentation, and classification of digital image data.

**Topic 8: Queueing Theory.** Introduction to the classical and modern theories of queueing systems. Simple Markovian queues; the M/G/1 and G/G/1 queues; Jackson and Kelly networks; multiclass networks; stability, scheduling, and routing in queueing networks; fluid and diffusion approximations. Additional prerequisite: Operations Research and Industrial Engineering 390R (Topic 1) or consent of instructor.

**Topic 9: Systems Simulation.** Random number generation, simulation experiments, statistical verification, clock routines, simulation language applications, industrial problems.

**Topic 10: Statistical Design of Experiments.** Introduction to statistical design of experiments based on both classical analysis of variance and modern heuristic techniques. Additional prerequisite: Operations Research and Industrial Engineering 390R (Topic 1) or the equivalent, 390R (Topic 2) or the equivalent, and 390R (Topic 6) or the equivalent.

**Topic 11: Advanced Stochastic Processes.** Markov renewal processes, generalized semi-Markov processes, marked point processes, Martingale theory, Brownian motion, Levy processes, and stochastic calculus.

**Topic 12: Multivariate Statistical Analysis.** Theory and applications of multivariate statistics, including multivariate parametric distributions, estimation, hypothesis testing, principal components analysis, canonical correlation, multivariate regression, and classification.

**Topic 14: Special Topics in Probability, Stochastic Processes, and Statistics.** Study of specialized topics, such as advanced stochastic processes, Bayesian statistics, simulation, and stochastic optimization, intended to introduce and stimulate further research. Additional prerequisite: Consent of instructor.

**Topic 15: Nuclear Safety and Security.** Same as Mechanical Engineering 388H. Probabilistic risk assessment models and nuclear arms nonproliferation, including failure classifications; failure mode, effects, and criticality analysis (FMECA); fault and event trees; and reliability block diagrams. Discussion of specific areas from the Code of Federal Regulations. Only one of the following may be counted: Mechanical Engineering 337G, 388H, Operations Research and Industrial Engineering 390R (Topic 15).

**Topic 16: Markov Decision Processes.** The theory of Markov decision processes, also known as stochastic dynamic programming. Includes finite horizon, total discounted cost, and average cost problems; continuous-time and semi-Markov models; and applications in finance, queueing, and control theory. Additional prerequisite: A course in stochastic processes or consent of instructor.

**Topic 17: Decision Analysis.** Principles and application of techniques for the logical illumination of complex decision problems within any context. Subjects may include utility theory, probability as a statement of belief, risk preference, value of information and control, probability assessment, influence diagrams, risk sharing and scaling, and life-and-death decision making.

**Topic 18: Decision Engineering.** Application of decision analysis in practice including framing, decision modeling, sensitivity analysis, discretization, psychological aspects of decision making, probability assessment, and challenges to the decision analysis framework. May include related subjects such as real options, bidding, and portfolio management.

### **ORI 391Q. Optimization.**

Mathematical optimization techniques with applications to engineering and industrial problems. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and a course in operations research methods.

**Topic 1: Nonlinear Programming.** Theory and solution techniques for nonlinear, continuous optimization problems. Topological properties of functions, general convexity, optimality conditions, line search methods, unconstrained techniques, and algorithms for constrained formulations. Lagrangian duality theory and bundle methods for nondifferentiable optimization.

**Topic 2: Dynamic Programming.** Systems that require sequential decisions. Problem modeling and solution algorithms for deterministic and stochastic systems.

**Topic 3: Network Flow Programming.** Optimization problems related to network flows, shortest path, maximum flow, minimum cost flow, generalized networks, nonlinear costs. Modeling, theory, and computational methods.

**Topic 4: Integer Programming.** Models, theory, and computational methods for problems with discrete decision alternatives. Greedy algorithms, branch and bound, cutting plane methods, Lagrangian relaxation, and heuristics.

**Topic 5: Linear Programming.** Models, algorithms, and theory of linear programming. Linear programming geometry, primal, dual and revised simplex algorithms, duality theory, optimality conditions, sensitivity analyses, interior point methods, and computer implementations.

**Topic 6: Algorithms for Mixed Integer Programming.** Methods and software for solving large-scale mixed integer programming problems: intelligent heuristics, decomposition, lower bounding schemes, limited enumeration, and simple methods for quickly finding good feasible solutions. Numerous examples taken from industry. Additional prerequisite: A graduate course in integer programming.

**Topic 8: Combinatorial Optimization.** Optimization of combinatorial structures; computational complexity; stable marriages, shortest paths, maximum flows, minimum-cost flows, matching problems; approximation algorithms for NP-hard problems.

**Topic 9: Large-Scale Systems Optimization.** Mathematical programs with special structure, Dantzig-Wolfe decomposition, partitioning and relaxation procedures, duality and decomposition, compact inverse methods, applications in engineering and management.

**Topic 10: Stochastic Optimization.** Optimization of mathematical programming models under uncertainty; model formulations; exact, bounding-and-approximation, and Monte Carlo sampling-based solution techniques that exploit special structures; applications; use of algebraic modeling language.

**Topic 11: Advanced Mathematical Programming.** Advanced topics in modeling and algorithms for linear, integer, nonlinear, and network programming. Model formulation considerations, decomposition algorithms, interior point and active set methods, duality, modern optimization software. Additional prerequisite: Operations Research and Industrial Engineering 391Q (Topic 5).

**Topic 12: Metaheuristics.** Reactive and adaptive tabu search methods, simulated annealing, genetic algorithms, and greedy randomized adaptive search methods. Emphasis on theoretical context of methods and on similarities and distinguishing characteristics.

**Topic 14: Computational Optimization.** Computer programming methods and tools for implementing advanced optimization algorithms, working with data, and visualizing results. Code organization techniques, debugging, and building complex software. Offered on the letter-grade basis only. Additional prerequisite: Coursework in computer programming, algorithms and optimization, and probability; or consent of instructor.

### **ORI 397. Current Studies in Operations Research and Industrial Engineering.**

The equivalent of three class hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **ORI 197K, 297K, 397K. Graduate Seminar.**

One, two, or three lecture hours a week for one semester. Normally required of all students in operations research and industrial engineering. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **ORI 397M. Graduate Research Internship.**

Students conduct research in an industrial setting to gain practical experience in their area of interest. Twenty to forty hours of fieldwork a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser and supervising faculty member.

### **ORI 197P, 297P, 397P. Projects in Operations Research and Industrial Engineering.**

Independent project carried out under the supervision of a faculty member in operations research and industrial engineering. Three, six, or nine laboratory hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.



### ORI 698. Thesis.

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in operations research and industrial engineering and consent of the graduate adviser; for 698B, Operations Research and Industrial Engineering 698A.

### ORI 398R. Master's Report.

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in operations research and industrial engineering and consent of the graduate adviser.

### ORI 399R, 699R, 999R. Dissertation.

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### ORI 399W, 699W, 999W. Dissertation.

Offered on the credit/no credit basis only. Prerequisite: Operations Research and Industrial Engineering 399R, 699R, or 999R.

## Petroleum Engineering

*Master of Science in Engineering  
Doctor of Philosophy*

### For More Information

**Campus address:** Chemical and Petroleum Engineering Building (CPE) 2.502, phone (512) 471-3161, fax (512) 471-9605; campus mail code: C0300

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Petroleum and Geosystems Engineering, 200 East Dean Keeton Stop C0300, Austin TX 78712-1585.

**E-mail:** [pgegradoffice@mail.utexas.edu](mailto:pgegradoffice@mail.utexas.edu)

**URL:** <http://www.pge.utexas.edu/>

### Objectives

This program is designed to educate engineers to solve problems related to exploring and recovering subsurface resources such as oil and gas. The program allows students to take courses in a broad range of areas, including computational geosystems engineering, drilling engineering, environmental and geosystems engineering, formulation evaluation, petroleum economics, production engineering, and reservoir engineering.

Once students have chosen a degree option, they may choose to work closely with a faculty member conducting research in their area of interest. The program offers a doctoral degree based on a combination of coursework and research, and a master's degree based on either a thesis or a report, or on coursework alone.

### Facilities for Graduate Work

Excellent facilities for graduate research in petroleum and geosystems engineering are available in the Chemical and Petroleum Engineering Building. In addition to departmental offices and classrooms, the building houses over 40,000 square feet of laboratory space, providing unique capabilities for studies in production logging, vertical and inclined flow in wells, artificial lift, core flooding for enhanced oil recovery, subsurface environmental remediation, drilling, stimulation, rock mechanics, well log digitizing and interpretation, PVT analysis, reservoir simulation development and application, and unconventional resources. Additional

laboratory space at the J. J. Pickle Research Campus is used for research. A machine shop is maintained to fabricate and support research equipment.

In addition to the facilities of Information Technology Services, students have access to a host of computers housed in the Department of Petroleum and Geosystems Engineering, including numerous PCs, workstations, and supercomputing facilities at the Texas Advanced Computing Center. Excellent library facilities include the Mallet Chemistry Library, the Walter Geology Library, and the Kuehne Physics Mathematics Astronomy Library.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Matthew T Balhoff	Quoc P Nguyen
Steven L Bryant	Jon E Olson
Hugh C Daigle	Tadeusz W Patzek
Mojdeh Delshad	Gary A Pope
David DiCarlo	Masa Prodanovic
David N Espinoza	Kamy Sepehrnoori
John Timothy Foster	Mukul M Sharma
Kenneth E Gray	Sanjay Srinivasan
Larry W Lake	Carlos Torres-Verdin
Mark W McClure	Eric Van Oort
Kishore Mohanty	Mary F Wheeler

## Admission Requirements

All prospective degree candidates must have a background satisfactory for study of advanced petroleum engineering as determined by the Graduate Studies Committee. For students without this background, such as those without degrees in engineering or in the petroleum-related fields, the Graduate Studies Committee will recommend a program of coursework designed to prepare the student for graduate study. Complete requirements for admission are available online (<http://www.pge.utexas.edu/future/graduate/requirements>).

## Degree Requirements

### Master of Science in Engineering

With the approval of the Graduate Studies Committee, the student elects one of three options:

- 1. Thesis option.** Thirty semester hours (including six hours in the thesis course) are required to complete the program. In addition to the thesis, eighteen semester hours of work must be completed in the Department of Petroleum and Geosystems Engineering; six semester hours of supporting work must be completed outside the department.
- 2. Report option.** Thirty-three semester hours (including three hours in the report course) are required to complete the program. In addition to the report, twenty-four semester hours of work must be completed in the Department of Petroleum and Geosystems Engineering; six semester hours of supporting work must be completed outside the department.  
For students who plan to continue their studies and enter the doctoral degree program, the report may be a PhD proposal.
- 3. Option without thesis or report.** Thirty-six semester hours are required to complete the program. Twenty-seven to thirty semester hours of work must be completed in the Department of Petroleum and Geosystems Engineering; six to nine semester hours of supporting work must be completed outside the department.

All options must include at least eighteen semester hours of engineering courses. The program of coursework must be approved by the graduate adviser and the graduate dean. More detailed information is available online (<http://www.pge.utexas.edu/future/graduate/requirements>).

## Doctor of Philosophy

To qualify as a doctoral candidate, the student must fulfill the following requirements:

1. Hold a Master of Science degree in science or engineering. Upon formal petition by the student, the Graduate Studies Committee may waive this requirement on a case by case basis.
2. Perform satisfactorily on the qualifying procedures conducted by the Graduate Studies Committee.
3. Maintain a grade point average of at least 3.50 on all graduate coursework at the University of Texas at Austin.

In general, two to four years beyond the master's degree are required to complete the Doctor of Philosophy degree program. More detailed information is available online (<http://www.pge.utexas.edu/future/graduate/requirements>).

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Petroleum and Geosystems Engineering: PGE

#### **PGE 380, 680. Advanced Petroleum Laboratory for Master's Degree Candidates.**

For each semester hour of credit earned, the equivalent of one class hour a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and twelve semester hours of upper-division coursework in petroleum and geosystems engineering.

#### **PGE 381. Drilling Engineering.**

Not open to students who have a degree in petroleum engineering. Basic drilling terminology and advanced drilling engineering topics. Three lecture hours a week for one semester. Required for students pursuing the doctoral degree in petroleum engineering. Prerequisite: Graduate standing in petroleum engineering.

#### **PGE 381K. Engineering Analysis.**

Application of classical methods of mathematical analysis to problems frequently encountered in engineering applications. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **PGE 381L. Advanced Petrophysics.**

Measurement, interpretation, and analysis of petrophysical properties of petroleum reservoir rocks. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **PGE 381M. Transport Phenomena.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing in computational and applied mathematics, engineering, or geological sciences.

#### **PGE 382. Basic Geological Concepts for Engineers.**

Basic geological principles for students with little or no geological background. Three lecture hours a week for one semester. Prerequisite: Graduate standing in petroleum or civil engineering.

#### **PGE 382K. Theory and Application of Reservoir Transients.**

Mathematical development and application of multiple pressure transients in well and reservoir systems. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **PGE 382L. Numerical Methods in Petroleum and Geosystems Engineering.**

The use of numerical methods and computers in the solution of petroleum and geosystems engineering problems. Three lecture hours a week for one semester. Computational and Applied Mathematics 382L and Petroleum and Geosystems Engineering 382L may not both be counted. Prerequisite: Graduate standing.

#### **PGE 383. Special Topics in Petroleum and Geosystems Engineering.**

Recent literature on petroleum production practice and petroleum and geosystems engineering problems. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in computational and applied mathematics, engineering, or geological sciences. Students seeking to enroll in any seminar must present technical prerequisites satisfactory to the instructor.

**Topic 2: Advanced Drilling Fluids.**

**Topic 5: Thermal Recovery.**

**Topic 10: Numerical Solution of Time-Dependent Problems.**

Computational and Applied Mathematics 383 (Topic 1: Numerical Solution of Time-Dependent Problems) and Petroleum and Geosystems Engineering 383 (Topic 10) may not both be counted.

**Topic 12: Near Wellbore Problems.**

**Topic 16: Topics in Computational Methods.** Computational and Applied Mathematics 383 (Topic 2: Topics in Computational Methods) and Petroleum and Geosystems Engineering 383 (Topic 16) may not both be counted.

**Topic 17: Naturally Fractured Reservoirs.**

**Topic 20: Geostatistics.**

**Topic 24: Natural Gas Engineering.**

**Topic 27: Rock Mechanics: Drilling, Completing, and Producing Applications.**

**Topic 28: Macroeconomics of Petroleum.**

**Topic 30: Fundamentals of Subsurface Environmental Engineering.**

**Topic 32: Hydraulic Fracture Design and Evaluation.**

**Topic 33: Advanced Drilling and Well Completion.**

**Topic 35: Advanced Production Engineering.**

**Topic 36: Advanced Numerical Methods.**

**Topic 38: Chromatographic Transport and Geochemical Modeling.**

**Topic 39: Design and Analysis of Pumping Systems.**

**Topic 41: Energy Finance.**

**Topic 46: International Petroleum Concessions and Agreements.**

**Topic 50: Reservoir Applications of Foam.**

**Topic 51: Special Problems in Well-Logging.**

**Topic 55: Pore-Level Petrophysics.** Geological and mathematical investigation of pore-scale basis for transport phenomena and petrophysical properties of sedimentary rocks. Additional prerequisite: Petroleum and Geosystems Engineering 381L or consent of instructor.

**Topic 56: Stochastic Methods for Reservoir Modeling.** Spatial interpolation and stochastic simulation techniques for reservoir characterization.

**Topic 57: Deepwater Operations.** Overview of various technical, logistical, and managerial elements that are functionally integrated in

deepwater operations, with emphasis on applications in the Gulf of Mexico.

**Topic 58: Applied Reservoir Characterization.** Reservoir modeling using software tools for statistical analysis of reservoir data; variogram analysis and modeling; spatial interpolation (kriging); tools for data integration in kriging; stochastic simulation of rock types (lithology), pay thickness/porosity, and permeability; inputting geological models into flow simulation; uncertainty assessment.

**Topic 59: Oil and Gas Production Facilities Design.** Applied theory relating to field processing of hydrocarbons and water, including hydrocarbon and gas separation, gas sweetening and dehydration, gas compression, fluid metering, process control, corrosion, and safety systems. Additional prerequisite: Petroleum and Geosystems Engineering 381M and 384, or consent of instructor.

**Topic 60: Energy and Earth Resource Economics.** Same as Energy and Earth Resources 396 (Topic 1: Energy and Earth Resource Economics). Theoretical and applied topics in natural resource economics, including project analysis, production theory, industrial organization, markets and regulation, and environmental economics.

**Topic 61: Project Management.** Overview of project management theory and practice in the natural resource sector, with a focus on exploration and production of energy resources.

**Topic 62: Energy and the Environment.** A survey course covering current and potential energy sources, what the energy supply mix will be in the future, and how this might impact the environment.

#### **PGE 384. Advanced Thermodynamics and Phase Behavior.**

Thermodynamic study of pressure/volume/temperature/composition relationships in oil and gas mixtures. Three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing in petroleum engineering and twelve semester hours of upper-division coursework in petroleum and geosystems engineering.

#### **PGE 385K. Advanced Multi-Well Formation Evaluation.**

Advanced concepts in formation evaluation for the estimation of static and dynamic petrophysical properties of rocks from well logs, core data, and geological information. Multi-well data sets, seismic amplitude data, and regional geological studies are used to construct hydrocarbon reservoir models amenable to production forecast and improved development of available reserves. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and a course in fundamentals of well logging.

#### **PGE 385M. Advanced Well-Logging and Correlation.**

Advanced well-logging for the geologist and engineer, involving working problems with suites of well logs to cover advanced mapping and logging techniques. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Petroleum and Geosystems Engineering 368, and Geological Sciences 383.

#### **PGE 386K. Advanced Fluid Flow in Porous Media.**

The hydrodynamic equations governing the steady state flow of homogeneous fluids in porous media and their application to petroleum and geosystems engineering problems. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **PGE 387. Secondary Recovery of Petroleum.**

Recovery by gas injection and water flooding. Three lecture hours a week for one semester. Prerequisite: Graduate standing in petroleum engineering and twelve semester hours of upper-division coursework in petroleum and geosystems engineering.

#### **PGE 387K. Fundamentals of Enhanced Oil Recovery I.**

Recent innovations in the recovery of petroleum by injecting fluids miscible with the oil or by application of heat to the reservoir. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **PGE 387L. Fundamentals of Enhanced Oil Recovery II.**

Basic concepts and principles of chemical flooding methods of enhanced oil recovery, which include polymer flooding, surfactant-polymer flooding (SP), alkaline-surfactant-polymer flooding (ASP), chemical imbibitions by wettability alteration methods and surfactant-gas (SG) methods, and also some comparisons with other EOR methods such as miscible gas flooding when appropriate and as time permits. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **PGE 388. Advanced Reservoir Engineering.**

Basic concepts of reservoir engineering, with applications to the production of hydrocarbons from both gas and oil reservoirs. Examines the governing equations for flow in permeable media, as well as concepts such as streamline flow; pseudo-steady-state flow, fractional flow, and both immiscible and miscible flow. Uses black oil and compositional reservoir simulators. Three lecture hours a week for one semester. Prerequisite: Graduate standing in computational and applied mathematics, engineering, or geological sciences. Students must present technical prerequisites satisfactory to the instructor.

#### **PGE 389. Economic Analysis in the Petroleum Industry.**

Engineering justification for capital outlay in the petroleum industry. Three lecture hours a week for one semester. Prerequisite: Graduate standing in engineering or geological sciences.

#### **PGE 290, 390, 690, 990. Advanced Laboratory for Doctoral Candidates.**

For each semester hour of credit earned, the equivalent of one class hour a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in petroleum engineering.

#### **PGE 392K. Numerical Simulation of Reservoirs.**

Development and application of reservoir simulator models to primary and secondary recovery processes in reservoir engineering. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **PGE 193, 293, 393. Research Seminar.**

For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### **PGE 397M. Graduate Research Internship.**

For students holding Master of Science degrees from other institutions who wish to pursue Doctor of Philosophy degrees at the University of Texas at Austin. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser and the dean of the Cockrell School of Engineering.

#### **PGE 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in petroleum engineering and consent of the graduate adviser; for 698B, Petroleum and Geosystems Engineering 698A.

#### **PGE 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for

one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in petroleum engineering and consent of the graduate adviser.

#### **PGE 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

#### **PGE 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Petroleum and Geosystems Engineering 399R, 699R, or 999R.

## College of Fine Arts

### Fine Arts

*Master of Arts*  
*Master of Fine Arts*  
*Master of Music*  
*Doctor of Musical Arts*  
*Doctor of Philosophy*

### Facilities for Graduate Work

In addition to the academic departments, the College of Fine Arts includes the Performing Arts Center and the Blanton Museum of Art. These components provide University students and the Austin community with opportunities to attend art exhibitions, plays, operas, ballets, recitals, and concerts by internationally renowned artists and companies. Austin's proximity to Houston, San Antonio, Dallas, and Fort Worth places the major art collections and dramatic and musical events of those cities within a few hours' drive.

**Performing Arts Center.** Created in 1981, the Performing Arts Center complex includes six venues to accommodate diverse performances: Nancy Lee and Perry R. Bass Concert Hall (three thousand seats); the Ralph and Ruth McCullough Theatre (four hundred seats); Hogg Memorial Auditorium (twelve hundred seats); the B. Iden Payne Theatre (five hundred seats); the Oscar G. Brockett Theatre (two hundred seats); and Bates Recital Hall (seven hundred seats) which features a three-story Visser-Rowland tracker pipe organ. Support facilities include rehearsal rooms, paint shops, scene shops, costume shops, metal shop, prop shop, and administrative offices.

The Performing Arts Center's season program includes artists from around the world, reflecting a multitude of cultures and art forms. In addition, the Performing Arts Center maintains the Lifelong Learning program, which helps the Austin community to become more involved with the performing arts through lectures, master classes, residencies, youth performances, and workshops. The Performing Arts Center also serves as a learning laboratory for University students, providing them the opportunity to work alongside professionals in a variety of fields.

**Fine Arts Library.** Located in the E. William Doty Fine Arts Building, the Fine Arts Library contains materials on art, theatre, dance, and music.

The art collection supports instruction and research for the four divisions of the Department of Art and Art History: art history, design, studio art, and visual arts studies/art education. The collection includes materials on most art and design movements and schools, photography, and art education. Artists of most periods and nationalities and studies of their works are represented, as are most media and techniques.

The theatre and dance collection supports the Department of Theatre and Dance, which concentrates on performance, especially play production, theatrical design, playwriting, theatre education, and dance. Materials

on other types of theatrical presentations, such as magic, circuses, and pantomime, are included. The Fine Arts Library holds texts of major plays written in English or translated into English, with contemporary plays collected most heavily. The Perry-Castañeda Library also holds texts of plays in English and other languages, with emphasis on plays as a literary form and on literary criticism.

The music collection supports instruction and research in the Sarah and Ernest Butler School of Music, which includes music performance, composition, ethnomusicology, music and human learning, music theory, and musicology. Most historical periods and geographical areas are covered in both classical and popular idioms, though the emphasis is on the Western classical tradition. Music is represented in a wide variety of printed and recorded formats.

The special collections of the Fine Arts Library include the Historical Music Recordings Collection, the papers of the Paramount and State Theatres, and papers of Sam Shepard. The Historical Music Recordings Collection is an archive of audio recordings in all formats. Holding more than two hundred thousand items, it is one of the largest collections of audio recordings in the United States. The Paramount and State Theatre archive is an archival collection of about three thousand items, including posters, fliers, documents, and ephemera from Austin's historic Paramount and State Theatres. The Sam Shepard Collection is an archival collection of materials by Pulitzer Prize-winning playwright, actor, and author Sam Shepard. The archive contains materials from the latter part of Shepard's career, roughly from the late 1970s to the present, and includes manuscripts, film scripts, correspondence, volumes from his personal library, and awards.

Fine Arts Library services include reference and research assistance, instruction, circulation and reserves, and media and technology support. The Fine Arts Library is wireless and offers a wide variety of media equipment including laptops, digital cameras, and portable compact disc players available for check-out. In addition, the Fine Arts Library has computing hardware and a wide variety of software to support the study of fine arts.

### Areas of Study

Graduate study is available in the following areas: in the Department of Art and Art History: art history, studio art, design, and art education; in the Butler School of Music: performance (including conducting and opera), music and human learning, musicology (including ethnomusicology), composition, conducting, and theory (a jazz emphasis is available in approved areas); and in the Department of Theatre and Dance: dance, directing, drama and theatre for youth, performance as public practice, playwriting, stage technology, teacher training, and theatrical design. See Art Education (p. 189), Art History (p. 190), Design (p. 192), Music (p. 194), Studio Art (p. 199), and Theatre and Dance (p. 200) for more information. Further information is available from the graduate adviser of each program.

### Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## Fine Arts: F A

### F A 381. The Arts.

Topics within the fine arts, or including the fine arts and other areas. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Managing Performing Arts Organizations.** Focuses on the business aspect of performing arts and, in particular, nonprofit, mission-based arts organizations with an emphasis on organizational structure; budget development and management; strategic planning; trustee development; trustee/staff relations; fundraising; marketing and publicity; audience development, development of outreach programming; box-office management; operations and human resources; and collective bargaining agreements/labor relations, and contract negotiation. Fine Arts 381 (Topic: Managing Performing Arts Organizations) and Fine Arts 381 (Topic 1) may not both be counted.

**Topic 2: Philanthropy And The Arts.** Examines sources, characteristics, and consequences of cultural philanthropy in the United States. Explores practical implications of how private philanthropy works for those engaged in seeking and awarding support. Compares different types of private funders, examines relationship of philanthropy to overall support for culture (including public subsidy and policy) and assesses impact of philanthropy on the arts. Exercises and cases will be used to translate broad themes to practical issues related to formulating and implementing strategies for seeking resources and supporting arts and culture. Fine Arts 381 (Topic: Philanthropy And The Arts) and Fine Arts 381 (Topic 2) may not both be counted.

### F A 382. Independent Studies: Art, Drama, or Music.

Study or research in art, drama, or music, or among these areas, or between these areas and other disciplines. Individual instruction. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor and of the dean of the College of Fine Arts.

## Art Education

*Master of Arts*

### For More Information

**Campus address:** Art Building (ART) 3.330, phone (512) 471-3377; campus mail code: D1300

**Mailing address:** The University of Texas at Austin, Graduate Program in Art Education, Department of Art and Art History, 2301 San Jacinto Boulevard D1300, Austin TX 78712-1421

**E-mail:** ktshorb@austin.utexas.edu

**URL:** <http://www.utexas.edu/finearts/aah/admissions/graduate/art-education/overview>

### Facilities for Graduate Work

Students have access to a range of high-quality facilities for study on the University campus, as well as in the greater Austin community. There are many dynamic museums and active community-based art sites and programs that students can use for research and internships. Of particular note are the University's Blanton Museum of Art and Harry Ransom Center. Public school districts in Austin and the surrounding area also provide research and internship opportunities for students. Students have access to the University's comprehensive library system, including the Perry-Castañeda Library with more than 2.5 million volumes, and the Fine Arts Library, which contains a substantial visual and sound collection.

Both the Department of Art and Art History and the College of Fine Arts offer access to state-of-the-art computer facilities.

## Areas of Study

Art education occurs within a variety of locations, which may include public and private schools, museums, community centers, after-school programs, prisons, rehabilitation facilities, and assisted living centers. These settings provide on-site learning and research opportunities for students in the Master of Arts program. Students choose coursework and a guided internship in one of three emphases in art education: school focus, museum education focus, and community-based arts focus. The school focus emphasis is designed for students who want to enhance their knowledge of art education at the elementary and secondary school level; the museum education focus emphasis is designed for students interested in learning about and working in the field of art museum education; and the community-based arts focus emphasis is designed for students who want to investigate and conduct professional activities in art education in community-based sites or organizations.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Christopher O Adejumo  
Christina Bain  
Paul E Bolin

Lee R Chesney III  
Janice Leoshko  
Melinda M Mayer

## Admission and Degree Requirements

A bachelor's degree in art education, studio art, or art history is recommended for admission to any of the three emphases within the art education master's program. However, special consideration may be given to the applicant with a related bachelor's degree and prior experience in art teaching, museum education, or art education work in a community-based setting.

All emphases require thirty-six semester hours of coursework consisting of thirty hours in art education (including twelve hours in core art education courses, six hours in the student's chosen emphasis, three hours of internship or on-site experience, three hours in art education electives, and six hours in the thesis course); and six hours of studio art and/or art history. Students must present an approved thesis proposal to his or her thesis committee upon completion of eighteen semester hours of approved coursework and before beginning the thesis.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Art Education: AED

#### AED 381G. Foundations of Art Education.

Explores foundational writings and beliefs, past and present literature, and perspectives within art education. Three lecture hours a week for one semester. Prerequisite: Graduate standing in art education and consent of the graduate adviser.

### **AED 381K. Contemporary Issues in Art Education.**

The role of art education in education and society, including technology, multiculturalism, gender studies, contemporary art, visual and material culture, interdisciplinary connections, media studies, and community-based art education. Three lecture hours a week for one semester. Prerequisite: Graduate standing in art education, Art Education 381G, and consent of the graduate adviser.

### **AED 382G. Introduction to Research in Art Education.**

Explores diverse approaches and methodologies for conducting research in art education. Three lecture hours a week for one semester. Prerequisite: Graduate standing in art education and consent of the graduate adviser.

### **AED 382H. Thesis Proposal and Preparation.**

Focuses on the preparation of a graduate thesis proposal, with emphasis on the student's identification of a central research question. Three lecture hours a week for one semester. Prerequisite: For art education majors, graduate standing, Art Education 382G, and consent of the graduate adviser; for others, graduate standing and consent of instructor.

### **AED 383J. Museum Education: History and Theory.**

Historical and philosophical development of American art museum education. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **AED 383K. Museum Education: Practice and Application.**

The practice and application of museum education within the context of art museums. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **AED 384. Special Topics in Art Education.**

Readings, discussion, and research relevant to major current trends in art education. The equivalent of three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **AED 385. Independent Study in Art Education.**

Student-initiated study with an art education faculty member covering the topic of student's research focus. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing in art education, written approval of the designated faculty member, and consent of the graduate adviser.

### **AED 386. Internship and Field Study.**

Supervised observation and research in art education related to the candidate's area of emphasis. Three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing, written approval of designated faculty member, and consent of the graduate adviser.

### **AED 387C. Case Studies in Community-Based Art Education.**

Students review examples of community-based art programs to understand their histories, philosophies, purposes, organization, funding, operation, evaluation, and redevelopment; and discuss issues affecting the successful creation, preservation, and development of such programs. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **AED 387D. Program Development in Community-Based Art Education.**

Students examine the process of establishing an exemplary community-based art program; conduct ethnographic research and write grant proposals toward the creation of an ideal community-based art program or the improvement of an existing program; and develop operational

activities and explore various approaches to art production to prepare for implementing a program. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **AED 388C. Art Instruction through Arts-Based Research.**

Students observe teaching and learning styles in early childhood through grade twelve art classrooms and review and evaluate their observations using class discussions, journals, creative reports, and other arts-based research techniques. Three lecture hours and three hours of fieldwork a week for one semester. Prerequisite: Graduating Standing and consent of instructor.

### **AED 388D. Art and the Creation of Meaning.**

Discussion, analysis, and hands-on use of the materials, techniques, and processes used to create artwork in early childhood through grade twelve classrooms. Three lecture hours and three laboratory hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **AED 388E. Art and Critical Discourse.**

Focuses on personal and professional critiques of artifacts and artistic products. Students explore and justify their responses to artwork in written and verbal discussion. Three lecture hours and three laboratory hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **AED 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in art education; Art Education 382G and 382H; eighteen semester hours of coursework in art education, art history, or studio art; and consent of the graduate adviser; for 698B, Art Education 698A.

### **AED 398T. Supervised Teaching in Art Education.**

Teaching under the close supervision of the course instructor for one semester; weekly group meetings with the instructor, individual consultations, and reports throughout the teaching period. Two lecture hours and four laboratory hours a week for one semester. Prerequisite: Graduate standing in art education, or graduate standing and appointment as a teaching assistant.

## **Art History**

Master of Arts  
Doctor of Philosophy

### **For More Information**

Campus address: E. William Doty Fine Arts Building (DFA) 2.502, phone (512) 232-2047; campus mail code: D1300

Mailing address: The University of Texas at Austin, Graduate Program in Art History, Department of Art and Art History, 1 University Station D1300, Austin TX 78712

**E-mail:** [maureenc@austin.utexas.edu](mailto:maureenc@austin.utexas.edu)

**URL:** <http://www.utexas.edu/finearts/aah/academic/art-history/graduate/overview>

### **Facilities for Graduate Work**

Facilities for study and research include an open-shelf fine arts library containing more than 125,000 volumes and periodicals; extensive digital-image databases; and the Blanton Museum of Art, which has an active exhibition program and can provide training in the various aspects of museum work.

The Fine Arts Library is supplemented by the Perry-Castañeda Library, with holdings of more than 2.5 million volumes; the rare books and manuscripts of the Harry Ransom Center; and the specialized libraries of the School of Architecture, the Department of Classics, and the Teresa Lozano Long Institute of Latin American Studies.

Visual resources on campus include the Mari and James A. Michener Collection of American Painting; the Duncan Collection of Latin American Art; the Suida-Manning Collection of Renaissance and Baroque Art; an encyclopedic print collection; the Battle Collection of casts after ancient sculpture; and additional drawings, paintings, prints, sculptures, silver, and furniture. Visual resources in the Harry Ransom Humanities Research Center include rare books, manuscripts, photographs, film, and art.

## Areas of Study

Graduate study in art history is offered in traditional areas of Western art and in African and African American, Asian, Islamic, Latin American, Chicano/a, US Latino/a, and pre-Columbian art. The student may pursue the degree of Master of Arts or that of Doctor of Philosophy.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Edward Chambers	Athanasio Papalexandrou
Michael J Charlesworth	Glenn A Peers
John R Clarke	Susan W Rather
Penelope J Davies	Ann M Reynolds
George F Flaherty	YunChiahn C Sena
Julia E Guernsey	Richard A Shiff
Linda D Henderson	Cherise Smith
Joan A Holladay	Jeffrey C Smith
Janice Leoshko	David S Stuart
Stephennie Mulder	Louis A Waldman
Moyosore Benjamin Okediji	

## Admission and Degree Requirements

### Master of Arts

Students seeking admission to the Master of Arts degree program are expected to have an undergraduate degree in art history or to have completed substantial coursework in art history. Students must also demonstrate the capacity for advanced academic work.

The program requires thirty semester hours of coursework, including six hours in the thesis course and six hours in supporting work (supporting work consists of upper-division or graduate courses in such related areas as history, literature, anthropology, archaeology, classical civilization, philosophy, architecture, music, museum education, and area studies). In addition to Art History 395, *Art Historical Methods*, the student must complete four seminars selected according to his or her chosen degree track (general, ancient, medieval to early modern, or modern). The student takes an additional three semester hours of art history preferably as a seminar but, in certain cases, as a reading tutorial (Art History 396, *Advanced Reading Tutorial*) or a lecture tutorial (Art History 396K, *Advanced Lecture Tutorial*). The student must show evidence of the ability to read one foreign language by the end of three long-session semesters in the program.

## Doctor of Philosophy

For admission to the Doctor of Philosophy degree program, the student must have a master's degree in art history, or have completed substantial coursework in art history on both the undergraduate and graduate levels. Students with special backgrounds in other disciplines are judged on an individual basis.

Degree requirements are: (1) completion of five seminar courses, including coursework in at least two of the following chronological areas of Western and non-Western art: ancient, medieval to early modern, and modern; (2) reading competence in two foreign languages; (3) successful participation in the dissertation colloquium; (4) a written and oral qualifying examination that admits the student to candidacy; (5) the dissertation; and (6) the oral defense of the dissertation.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Art History: ARH

#### ARH 381. Topics in Latino and Chicano Art.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in art history and consent of the graduate adviser.

#### ARH 381L. Topics in Ancient Near Eastern Art.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in art history and consent of the graduate adviser.

#### ARH 382. Topics in Greek and Roman Art.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in art history and consent of the graduate adviser.

#### ARH 382R. Topics in the Art of Late Antiquity.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in art history and consent of the graduate adviser.

#### ARH 383. Topics in Medieval Art.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in art history and consent of the graduate adviser.

#### ARH 384. Topics in Renaissance Art.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in art history and consent of the graduate adviser.

#### ARH 385. Topics in Baroque Art.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in art history and consent of the graduate adviser.

**ARH 386G. Topics in Eighteenth-Century Art.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in art history and consent of the graduate adviser.

**ARH 386J. Topics in Nineteenth-Century Art.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in art history and consent of the graduate adviser.

**ARH 386N. Topics in Twentieth-Century Art.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in art history and consent of the graduate adviser.

**ARH 386P. Topics in Modernism.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

**ARH 387. Topics in the Art of North America.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in art history and consent of the graduate adviser.

**ARH 390. Topics in Pre-Columbian Art.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in art history and consent of the graduate adviser.

**ARH 392. Topics in the Art of East Asia.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in art history and consent of the graduate adviser.

**ARH 393C. Topics in Africana Art.**

The equivalent of three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in art history and consent of the graduate adviser.

**ARH 393D. Topics in Diaspora Art.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in art history and consent of the graduate adviser.

**ARH 393E. Topics in African American Art.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in art history and consent of the graduate adviser.

**ARH 394. Special Topics in the History of Art.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in art history and consent of the graduate adviser.

**Topic 1: Critical Theory, Poststructuralism, and Art History.**

**Topic 2: Administration and Development of Visual Resources Collections.**

**ARH 395. Art Historical Methods.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in art history and consent of the graduate adviser.

**ARH 396. Advanced Reading Tutorial.**

Individual instruction arranged by the student. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

**ARH 396C. Reading Tutorial.**

Individual instruction arranged by the student. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**ARH 396K. Advanced Lecture Tutorial.**

Individual instruction arranged by the student. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

**ARH 396L. Advanced Studies in the History of Latin American Art: Reading Tutorial.**

Conference course. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in art history and consent of the graduate adviser.

**ARH 396P. Qualifying Examination Preparation.**

Individual instruction arranged by the student. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**ARH 397. Doctoral Colloquium.**

Conference course for students preparing for dissertation colloquium. Individual instruction arranged by the student. May not be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing, admission to the doctoral program in art history, and consent of instructor.

**ARH 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in art history and consent of the graduate adviser; for 698B, Art History 698A.

**ARH 398T. Supervised Teaching in Art History.**

Teaching under the close supervision of the course instructor for one semester; weekly group meetings with the instructor, individual consultations, and reports throughout the teaching period. Three lecture hours a week for one semester. Prerequisite: Graduate standing in art history, or graduate standing and appointment as a teaching assistant.

**ARH 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

**ARH 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Art History 399R, 699R, or 999R.

## Design

*Master of Fine Arts*

### For More Information

**Campus address:** Art Building (ART) 3.330, phone (512) 471-3377; campus mail code: D1300

**Mailing address:** The University of Texas at Austin, Graduate Program in Design, Department of Art and Art History, 2301 San Jacinto Boulevard Stop D1300, Austin TX 78712-1412



**E-mail:** ktshorb@austin.utexas.edu

**URL:** <http://www.utexas.edu/finearts/aah/admissions/graduate/design/overview>

## Facilities for Graduate Work

In addition to the extensive library and computer resources available on campus, the design program supports a computer laboratory dedicated to addressing students' specific needs, including typography, two-dimensional and three-dimensional imaging, sound animation, and video. Many items, including digital video and digital still cameras, can be borrowed by students. The laboratory is staffed sixty hours a week during the long semesters. Graduate students have twenty-four-hour access to the laboratory. In addition to a fully equipped black-and-white darkroom, a photo studio supports the image-capturing requirements of photographic, digital, and video technologies. Letterpress facilities are complemented by an extensive collection of wood and metal type for printing and book projects, and the Department of Art and Art History wood shop addresses many three-dimensional prototyping needs. Studio space is provided specifically for graduate students.

## Areas of Study

The focus of the program is on the creation of a multidisciplinary environment within which students are encouraged to use critical skills to investigate the social, political, and economic contexts in which design is created and used. This emphasis on critical and contextual investigation applies to all forms of learning in the program, including the making of artifacts and more abstract exploration of design issues through discussion, reading, and writing.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Paul E Bolin	Teresa Hubbard
Kate Catterall	Gloria J Lee
Carma Ryanne Gorman	

## Admission and Degree Requirements

Applicants for admission to the program are expected to be students or practitioners who are independent and self-motivated and who demonstrate an advanced interest in exploring alternative concepts of design. Applicants must submit documentation of their work as part of the admission application; information about this requirement is available from the Department of Art and Art History. Applicants are not required to submit Graduate Record Examinations scores.

Candidates for the degree must complete at least sixty semester hours of coursework, chosen with the advice of the graduate adviser. At least thirty hours of graduate coursework must be in design (the major), and at least six hours must be outside design (the minor). The remaining hours may be selected from courses in any area; only nine hours of upper-division undergraduate coursework may be included.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also

reflect changes made to the course inventory after the publication of this catalog.

## Design: DES

### DES 380. Core Course in Design.

Introduction to design process, research, and methodologies. Three lecture hours a week for one semester, with additional laboratory hours to be arranged. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### DES 381. Core Laboratory 1.

Practice laboratory for a variety of design methodologies. Three lecture hours a week for one semester, with additional laboratory hours to be arranged. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### DES 382. Critique Studio.

Context and structured dialogue regarding areas of, and the student's own direction in, graduate research. Three lecture hours a week for one semester, with additional laboratory hours to be arranged. May be repeated for credit. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### DES 383. Graduate Projects.

Independent study. May be repeated for credit. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### DES 391. Core Laboratory 2.

Designed to provide students with the opportunity to test and expand their design research through writing and various methods of dissemination. Three lecture hours a week for one semester, with additional laboratory hours to be arranged. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### DES 392. Professional Communication of Research.

Seminar addressing strategies for communicating design research processes and results to a variety of audiences through vehicles such as exhibitions, scholarly reports, and video recordings. Three lecture hours a week for one semester, with additional laboratory hours to be arranged. May be repeated for credit. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### DES 393. Issues in Design Theory and Research.

Investigates current discourse within design studies. Three lecture hours a week for one semester, with additional laboratory hours to be arranged. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### DES 394. Advanced Issues in Design.

Examination of design practice in all areas, and its relationship to research. Three lecture hours a week for one semester, with additional laboratory hours to be arranged. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### DES 395. Fieldwork in Design.

A structured course based upon current design issues. Students work in a collaborative environment using design as an effective method of change or research. Three lecture hours a week for one semester, with additional laboratory hours to be arranged. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **DES 398R. Master's Report.**

The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in design and consent of instructor or the graduate adviser.

### **DES 398S. Master's Exhibition.**

The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in design and consent of instructor or the graduate adviser.

### **DES 398T. Supervised Teaching in Design.**

Training and teaching under the close supervision of the course instructor for one semester; group meetings with the instructor, individual consultations, and reports throughout the teaching period. Three lecture hours a week for one semester. Prerequisite: Graduate standing in design, or graduate standing and appointment as a teaching assistant.

## **Music**

*Master of Music  
Doctor of Musical Arts  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Music Recital Hall (MRH) 3.702, phone (512) 232-2066, fax (512) 232-6289; campus mail code: E3100

**Mailing address:** The University of Texas at Austin, Graduate Program, Butler School of Music, 2406 Robert Dedman Drive Stop E3100, Austin TX 78712

**E-mail:** [mga@mail.music.utexas.edu](mailto:mga@mail.music.utexas.edu)

**URL:** <http://www.music.utexas.edu/>

### **Facilities for Graduate Work**

The Fine Arts Library has excellent facilities for research in its collection of books, scores, periodicals, microforms, and sound recordings. In addition, the Harry Ransom Center houses many special collections of importance, including the Kraus Libretti Collection, the Bachmann Collection, the Carlton Lake Collection, and the Theodore Finney Collection. The Butler School of Music also maintains a collection of authentic early instruments, non-Western instruments, and folk instruments that are available for performance.

### **Areas of Study**

**Performance.** Degrees in this area are awarded for performance on various instruments, in voice, opera, conducting, collaborative piano, and chamber music. In addition to demonstrating the technical achievements of the artist-performer, the student is expected to exhibit a thorough knowledge of the theoretical, pedagogical, and historical aspects of the major, as well as a knowledge of the literature of the performance area.

**Music and human learning.** Students in this major study the fundamental principles of human learning and behavior as applied in all aspects of music activity, including performance, perception, composition, analysis, pedagogy, and the role of music in elementary and secondary schools and in higher education. Individual courses of study are uniquely designed to broaden and refine the knowledge and skills of experienced educators, preparing them for advanced careers as teachers and scholars in the various dimensions of research and professional education.

**Musicology/ethnomusicology.** Students in this major have the opportunity to acquire the appropriate tools and methods of research

in both historical musicology and ethnomusicology, and to study the history of music from the remote past to the present as well as the nature and function of music in the cultures of the world. The student also has the opportunity to do research in any historical aspect of music and to undertake field research in any cultural area. This major provides preparation for positions in college teaching, in research, in music criticism, and, with additional training, in library work. A broad background in the humanities and social sciences is essential for this area of study. Languages, history, philosophy (aesthetics), psychology, anthropology, cultural studies, and sociology are supporting, related fields.

**Composition.** Students in this major have the opportunity to acquire the tools to create music and convey their musical ideas through a variety of performance media. Students are expected to exhibit a thorough knowledge of the theoretical and historical basis of music and to develop strong pedagogical skills. A comprehensive general curriculum and optional concentrations in various areas of specialization help to prepare students for advanced careers as composers and teachers.

**Conducting.** Students in this major study the artistic, technical, physical, and leadership principles and skills required of successful conductors at the professional and postsecondary levels. Intensive coursework in conducting, score study, analysis, musicology, and theory is combined with opportunities to conduct University ensembles. Individual courses of study are tailored to prepare students for advanced careers as artists and teachers.

**Theory.** Students in this major study the principles of music, develop skills in music analysis and scholarly research, and prepare themselves to become college teachers in music theory. Competence in keyboard performance, proficiency in aural skills, a thorough knowledge of the pedagogy of music theory, and a broad background in the humanities are essential for this area of study.

### **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Gregory D Allen  
Byron P Almen  
Elliott M Antokoletz  
Nathaniel O Brickens  
James W Buhler  
Thomas A Burritt  
Robert M Carnochan  
Charles Daniel Carson  
B G Chandler  
Eugenia Costa-Giomi  
Andrew F Dell'Antonio  
Robert A Desimone  
Eric A Drott  
Robert A Duke  
Anne E Epperson  
Veit F Erlmann  
Robert Freeman  
John M Fremgen  
Nancy B Garrett  
Marianne Gedigian  
Sophia Gilmsen  
Donald J Grantham  
Robert S Hatten  
Jeffrey L Hellmer  
Rebecca Henderson  
Martha F Hilley  
Adam Holzman  
Patrick Hughes  
Judith A Jellison  
Kristin Wolfe Jensen  
Jerry F Junkin  
Brian D Lewis  
Hannah Lewis

William L Lewis  
Matthias Maierhofer  
John R Mills  
Robin D Moore  
James M Morrow Jr  
Roger E Myers  
Luisa Nardini  
Anton Nel  
David P Neumeyer  
Stephen C Page  
Edward R Pearsall  
Suzanne M Pence  
Bruce W Pennycook  
Russell F Pinkston  
A D Renner  
Glenn A Richter  
Ray K Sasaki  
Sonia T Seeman  
Yevgeniy Sharlat  
Stephen M Slawek  
David A Small  
Nikita Storojev  
Bion Tsang  
John R Turci  
Michael C Tusa  
Charles W Villarrubia  
Dan E Welcher  
Marianne Wheeldon  
Darlene C Wiley  
Nathan L Williams  
Laurie S Young  
Daxun Zhang  
Gerhardt Zimmermann

The examination stresses proficiency in pronunciation and is used to help the student plan a program of study.

## Master of Music

The Master of Music is offered in performance (including collaborative piano, conducting, opera coaching/directing, and chamber music), composition, theory, music and human learning, literature and pedagogy, musicology, and ethnomusicology. Entering students should have a bachelor's degree (or the equivalent) from an accredited institution.

Most programs of study leading to the Master of Music require between 30 to 36 semester hours of coursework depending on the specific degree plan. A program with a report in lieu of the thesis is used for musicology, ethnomusicology, music theory, and literature/pedagogy. A comprehensive examination is required of all master's degree candidates, usually in the final semester of study.

Further information about master's degrees is given in [Degree Requirements](#). Details of departmental requirements in the various areas of concentration are available from the graduate admissions coordinator.

## Doctor of Philosophy

The Doctor of Philosophy degree in music is offered with major emphases in music and human learning, musicology, ethnomusicology, and music theory. Candidates for this degree are required to pass a comprehensive examination and to write a dissertation based on original research. Information about requirements in the various areas of concentration is available from the graduate admissions coordinator.

## Doctor of Musical Arts

The Doctor of Musical Arts degree allows for four majors: performance (including opera, collaborative piano, and voice pedagogy emphases), conducting, composition, and music and human learning (including jazz pedagogy and piano pedagogy emphases). Candidates for this degree must pass a comprehensive examination. They must demonstrate outstanding professional competence, artistic maturity, and exceptional knowledge of the historical and practical aspects of their major field. Each candidate must prepare a scholarly treatise in a field appropriate to the major or complete the alternative requirements of the non-treatise degree option. For composition majors, an original musical work replaces the treatise. A jazz emphasis is also available in the performance and the composition majors.

Further information about requirements in various areas of concentration is available from the graduate admissions coordinator.

## Artist Diploma in Music Performance

The Artist Diploma is a highly specialized and performance-oriented non-degree graduate certificate program for exceptional musicians who have great potential for a professional career in music performance at the international level. To be considered for admission, applicants must meet the admission requirements for performance majors. The program requires completion of at least twenty-seven semester hours of graduate coursework, including but not limited to courses in performance, performance practice, and advanced music literature, as well as an artist recital course taken for each of three required recitals. Additional information is available from the graduate admissions coordinator.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course*

## Admission and Degree Requirements

All applicants are required to furnish a statement of intent in graduate study and three letters of reference pertaining to their potential for graduate work in music. Graduate Record Examinations scores are not required for composition, conducting and performance applicants. Applicants seeking admission to performance degree programs typically must perform a live audition. Exceptions and detailed instructions can be found on the Butler School of Music graduate admissions Web site (<http://www.music.utexas.edu/admissions/graduate/Default.aspx?id=53&Title=Welcome>). Those seeking admission to conducting and certain other areas must submit prescreening videos before arranging for a live audition on campus; those planning to major in composition must send scores and recordings of their music; and those planning to major in musicology, ethnomusicology, and music theory must submit samples of their written work. Those applying for admission to doctoral degree programs in music and human learning must submit samples of written work and video recordings of their teaching.

Diagnostic examinations in music theory and in music history and literature are required of all students before registration for the first semester of graduate work. Passing these examinations or remediation of the deficiencies by completing assigned courses is necessary for completion of every degree, and, in the case of doctoral students, is a prerequisite to doctoral comprehensive examinations.

Entering graduate students in voice are expected to have taken the equivalent of one semester each of Italian, French, and German and two semesters of diction. All entering graduate students in voice are given a diagnostic examination consisting of reading in these three languages.

*Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## Conducting: CON

### CON 280C, 380C, 480C. Master's Conducting.

Offered for band, choral, or orchestral conducting. For 280C, two lecture hours and two laboratory hours a week for one semester; for 380C, three lecture hours and two laboratory hours a week for one semester; for 480C, four lecture hours and two laboratory hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing; and intermediate-level conducting experience or consent of instructor.

### CON 290C, 490C. Doctoral Conducting.

Restricted to students pursuing a Doctor of Musical Arts in conducting. Offered for band, choral, or orchestral conducting. For 290C, two lecture hours and at least twelve practice hours a week for one semester; for 490C, two lecture hours and at least twelve practice hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing.

## Music: MUS

### MUS 380. Advanced Studies in the History and Culture of Music.

Historical and cultural studies of the music of various periods or places. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Medieval.**

**Topic 2: Renaissance.**

**Topic 3: Baroque.**

**Topic 4: Eighteenth Century.**

**Topic 5: Nineteenth Century.**

**Topic 6: Twentieth Century.**

### MUS 180C, 280C, 480C. Chamber Performance Practice.

Offered for chamber music groups with varying instrumentation. For 180C, one lecture hour and three laboratory hours a week for one semester; for 280C, one lecture hour and six laboratory hours a week for one semester; for 480C, two lecture hours and ten laboratory hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing in music, or graduate standing and consent of instructor.

### MUS 280D. Topics in Diction and Translation.

Advanced study in English, Italian, French, and German diction and translation. The equivalent of two lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in music.

### MUS 180E. Problems in Performance Practice.

Graduate music performance ensembles including instrumental, vocal, and opera theatre. One lecture hour and three laboratory hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing in music, or graduate standing and consent of instructor.

### MUS 180G. Improvisation (Non-Jazz).

One lecture hour and three laboratory hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing.

### MUS 280M. Group Piano Pedagogy.

The development of skills in teaching group piano; examination and evaluation of methods and materials used in keyboard instruction; learning styles; research. Two lecture hours and one laboratory hour

a week for one semester. Prerequisite: Graduate standing in music, or graduate standing and consent of instructor.

### MUS 280N. Technology in Voice Study.

The integration of computer technology and audiovisual equipment into applied voice instruction. One lecture hour and one and one-half laboratory hours a week for one semester. May be repeated for credit, but only two semester hours may be counted toward the Doctor of Musical Arts degree. Prerequisite: Graduate standing in music.

### MUS 480P. Graduate Course in Pedagogy.

Intensive study of the principles and methods of teaching various instruments at the college level. Two lecture hours a week for two semesters. Prerequisite: For 480PA, graduate standing in music, Music 460P or the equivalent, and consent of instructor; for 480PB, graduate standing in music, Music 480PA, and consent of instructor.

### MUS 180R, 280R. Vocal Repertoire Coaching.

For 180R, one lecture hour and three laboratory hours a week for one semester; for 280R, one lecture hour and six laboratory hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### MUS 180T, 280T. Accompanying.

For 180T, one lecture hour and three laboratory hours a week for one semester; for 280T, one lecture hour and six laboratory hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing.

### MUS 180V, 280V. Collaborative Piano: Vocal and Instrumental.

For 180V, one lecture hour and three laboratory hours a week for one semester; for 280V, one lecture hour and six laboratory hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### MUS 381. Reference and Research Materials in Music.

Three lecture hours a week for one semester. Prerequisite: Graduate standing in music.

### MUS 381J. Introduction to Musicology and Ethnomusicology.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in music.

**Topic 1: Foundations of Musicology.**

**Topic 2: Foundations of Ethnomusicology.**

**Topic 3: Proseminar in Musicological Research.**

**Topic 4: Analytical and Ethnographic Methods in Ethnomusicology.** Music 381J (Topic 3) and 381J (Topic 4) may not both be counted.

### MUS 383L. Seminar in Music Education.

Individual and group studies of advanced topics. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in music, and Music 391 or consent of instructor.

### MUS 384J. Advanced Studies in Music Education.

Review and criticism of research, acoustics, and psychology. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: History and Philosophy.**

**Topic 3: Current Trends in Music Education.**

**Topic 4: Research in Music Education I.**

**Topic 5: Tests and Measurements in Music.**

**Topic 8: Research in Music Education II.**

**Topic 9: Music Learning and Behavior.**

**MUS 284P. Practicum in a World Music Tradition.**

Open to any University student who can qualify by audition. Advanced training on a non-Western musical instrument such as Javanese gender barung, Indian sitar, Arabic qanun, or Korean kayageum, or advanced training in a non-Western vocal style, and other approved musical practices. Two lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing; two semesters of enrollment in a non-Western music ensemble, such as Javanese Gamelan, Middle Eastern or North Indian Music ensemble, or other approved music ensembles, and consent of instructor.

**MUS 385. Special Topics in Musicology.**

Research in depth on various topics. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in music.

**Topic 1: History of Music Theory to 1750.**

**Topic 2: History of Music Theory.**

**Topic 3: Notational Systems before 1400.**

**Topic 4: Notational Systems since 1400.**

**Topic 5: Studies in Organology.**

**MUS 385J. Seminars: Musicology and Ethnomusicology.**

Intensive studies of special problems and/or issues in music, broadly defined. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**MUS 385R. Directed Research in Musicology.**

Individual instruction. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

**MUS 386J. Topics in the History of Sacred Music.**

Introduction to a significant body of choral works, from the thirteenth century to the present age, composed especially for religious occasions and venues. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in music.

**MUS 286S. Music in Worship: Service Planning and Service Playing.**

The art and practice of preparing, rehearsing, and performing specific works of sacred music for religious occasions. Two lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in music.

**MUS 387L. Advanced Studies in Music Literature.**

Analytical and historical studies of a particular repertoire. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in music, or graduate standing and consent of instructor.

**Topic 1: Topics in the Solo Song.**

**Topic 2: Topics in Music for Keyboard Instruments.**

**Topic 4: Topics in Music for String Instruments.**

**Topic 5: Band Literature.**

**Topic 6: Topics in Choral Music.**

**Topic 7: Topics in Orchestral Music.**

**Topic 8: Topics in Band Music.**

**Topic 9: Topics in Opera.**

**Topic 10: Topics in Jazz.** Additional prerequisite: Music 343J or consent of instructor.

**Topic 11: Topics in Music Literature.**

**Topic 12: Topics in Collaborative Piano Literature.**

**Topic 13: Topics in Chamber Music.**

**MUS 388C. Composition.**

Individual instruction. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

**MUS 388E. Electronic Composition.**

Individual instruction. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

**MUS 388F. Film and Scoring Media.**

Three lecture hours a week for one semester. Music 688A (Topic: Film and Scoring Media) and 388F may not both be counted. Prerequisite: Graduate standing in composition, or graduate standing and consent of instructor.

**MUS 388G. Graduate Media Project.**

Individual instruction. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

**MUS 388J. Improvisation Styles and Techniques.**

The study and analysis of jazz improvisation. Three lecture hours a week for one semester. Music 688 (Topic 16) and 388J may not both be counted. Prerequisite: Graduate standing and consent of instructor.

**MUS 388K. Project in Jazz Composition.**

Individual instruction. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

**MUS 388M. Studies in Music Theory.**

Three class hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in music or graduate standing and consent of instructor; additional prerequisites vary by topic.

**Topic 1: Foundations of Music Theory.** Music 688 (Topic 2) and 388M (Topic 1) may not both be counted. Additional prerequisite: Graduate standing in music theory, musicology, ethnomusicology, or composition; or graduate standing and consent of instructor.

**Topic 2: Form Theory.** Music 688 (Topic 7) and 388M (Topic 2) may not both be counted. Additional prerequisite: Graduate standing in music theory, or graduate standing and consent of instructor.

**Topic 3: Contemporary Styles and Techniques.** Music 688 (Topic 9) and 388M (Topic 3) may not both be counted. Additional prerequisite: Graduate standing in music theory or composition, or graduate standing and consent of instructor.

**Topic 4: Current Trends in Music Theory.** Music 688 (Topic 15) and 388M (Topic 4) may not both be counted. Additional prerequisite: Graduate standing in music theory, musicology, or composition; or graduate standing and consent of instructor.

**Topic 5: Heinrich Schenker's Theory of Tonal Music.** Music 688 (Topic 11) and 388M (Topic 5) may not both be counted. Additional prerequisite: Graduate standing in music theory, or graduate standing and consent of instructor.

**Topic 6: Music and Meaning.** Music 688 (Topic: Music and Meaning) and 388M (Topic 6) may not both be counted. Additional prerequisite: Graduate standing in music theory, musicology, or composition; or graduate standing and Music 388T; or graduate standing and consent of instructor.

**Topic 7: Analysis of Popular Music.**

**MUS 388P. Jazz Pedagogy.**

Research and study of the methods and materials essential to teaching and planning a comprehensive curriculum in jazz studies. Three lecture

hours a week for one semester. Prerequisite: Graduate standing in music and consent of instructor.

### **MUS 388R. Directed Research in Music Theory.**

Individual instruction. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **MUS 388S. Seminar in Music Theory.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in music theory, musicology, ethnomusicology, or composition; or graduate standing and consent of instructor.

### **MUS 388T. Analytical Techniques.**

Three lecture hours a week for one semester. Music 688 (Topic 5) and 388T may not both be counted. Prerequisite: Graduate standing in music, or graduate standing and consent of instructor.

### **MUS 388V. Score Reading.**

Three lecture hours a week for one semester. Music 688 (Topic 8) and 388V may not both be counted. Prerequisite: Graduate standing in music, or graduate standing and consent of instructor.

### **MUS 391. Foundations of Music Education.**

Introduction to graduate study, history, philosophy, and basic concepts in music education. Three lecture hours a week for one semester. Required of all music and human learning majors. Prerequisite: Graduate standing.

### **MUS 392. Psychology of Music.**

Psychological aspects of music, emphasizing perception, experimental aesthetics, music function, and the nature of musical ability. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **MUS 393. Special Problems in Music Education.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: General Music.**

**Topic 2: Elementary School Music.**

**Topic 3: Choral Technique.**

**Topic 5: Directed Research.**

**Topic 7: Music in Higher Education.**

**Topic 8: Music and Exceptional Children.**

**Topic 9: Instrumental Music.**

**Topic 10: Computer Applications in Music Education.**

**Topic 11: Group Teaching: Materials and Methods.**

**Topic 12: Studio Piano: Goals and Procedures.**

### **MUS 194, 394, 694. Directed Reading.**

Readings in the literature of music. The equivalent of one, three, or six lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in music and consent of the graduate adviser.

### **MUS 395W. Writing about Music.**

Designed to develop and improve writing skills through required readings and through writing concert reviews, opinion pieces, essays, and articles about music. Three lecture hours a week for one semester. Prerequisite: Graduate standing in music.

### **MUS 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in music and consent of the graduate adviser; for 698B, Music 698A.

### **MUS 398D. Artist Recital.**

Preparation for and performance of a recital. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, Performance 480 with a grade of at least B, and consent of the graduate adviser.

### **MUS 398M. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in music and consent of the graduate adviser.

### **MUS 698R. Master's Recital.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698RA, graduate standing in performance or music literature and pedagogy, and course 380 or 480 in the appropriate instrument; for 698RB, Music 698RA.

### **MUS 398T. Supervised Teaching in Music.**

Supervised teaching for graduate students in music; two semesters under supervision; weekly meetings with instructor, consultations, reports throughout the teaching period. Three lecture hours a week for one semester. Prerequisite: Graduate standing and appointment as a teaching assistant.

### **MUS 399. Treatise.**

A research paper of a scholarly nature. Offered on the credit/no credit basis only. Prerequisite: Passage of preliminary and comprehensive examinations for the Doctor of Musical Arts degree.

### **MUS 399N. Nontreatise Lecture Recital Document.**

Restricted to students pursuing the nontreatise option for the Doctor of Musical Arts degree. A research paper of a scholarly nature. Offered on the credit/no credit basis only. Prerequisite: Passage of preliminary and comprehensive examinations for the Doctor of Musical Arts degree.

### **MUS 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **MUS 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Music 399R, 699R, or 999R.

## **Performance: PRF**

### **PRF 280, 380, 480. Graduate Course in Performance.**

Offered in opera (280, 480) and in the following instruments: bassoon (280, 480), clarinet (280, 480), double bass (280, 380, 480), euphonium (280, 480), flute (280, 480), French horn (280, 480), guitar (280, 380, 480), harp (280, 380, 480), oboe (280, 480), organ (280, 480), percussion (280, 480), piano (280, 380, 480), saxophone (280, 480), trombone (280, 480), trumpet (280, 480), tuba (280, 480), viola (280, 380, 480), violin (280, 380, 480), violoncello (280, 380, 480), and voice (280, 380, 480). Individual instruction. May be repeated for credit. Prerequisite: For Opera 280, 480, graduate standing in music and consent of the graduate adviser; for other fields, graduate standing in music, course 462 in the same instrument, and consent of the graduate adviser.

### **PRF 280J, 480J. Graduate Course in Performance: Jazz Improvisation.**

Individual instruction in jazz improvisation in the following instruments: double bass, drum set, guitar, piano, saxophone, trombone, trumpet, and vibraphone. Individual instruction. May be repeated for credit.

Prerequisite: Graduate standing in music and consent of the graduate adviser.

### **PRF 280V, 480V. Graduate Course in Performance: Collaborative Piano.**

Individual instruction in collaborative piano (accompanying). Individual instruction. May be repeated for credit. Prerequisite: Admission to a graduate program in music and consent of the graduate adviser.

### **PRF 290, 490. Advanced Graduate Course in Performance.**

Offered in opera and in the following instruments: bassoon, clarinet, double bass, euphonium, flute, French horn, guitar, harp, oboe, organ, percussion, piano, saxophone, trombone, trumpet, tuba, viola, violin, violoncello, and voice. Individual instruction. May be repeated for credit. Prerequisite: Admission to a doctoral degree program in music and consent of the graduate adviser.

### **PRF 290J, 490J. Advanced Graduate Course in Performance: Jazz Improvisation.**

Individual instruction in jazz improvisation in the following instruments: double bass, drum set, guitar, piano, saxophone, trombone, trumpet, and vibraphone. Individual instruction. May be repeated for credit. Prerequisite: Admission to a doctoral degree program in music and consent of the graduate adviser.

### **PRF 290V, 490V. Advanced Graduate Course in Performance: Collaborative Piano.**

Individual instruction in collaborative piano (accompanying). Individual instruction. May be repeated for credit. Prerequisite: Admission to a doctoral program in music and consent of the graduate adviser.

## **Studio Art**

*Master of Fine Arts*

### **For More Information**

**Campus address:** Art Building (ART) 3.330, phone (512) 471-3377; campus mail code: D1300

**Mailing address:** The University of Texas at Austin, Graduate Program in Studio Art, Department of Art and Art History, 2301 San Jacinto Boulevard D1300, Austin TX 78712-1421

**E-mail:** [ktshorb@austin.utexas.edu](mailto:ktshorb@austin.utexas.edu)

**URL:** <http://www.utexas.edu/finearts/aah/academic/studio-art/graduate/overview>

### **Facilities for Graduate Work**

Studios for all areas are housed in the Art Building, and graduate students generally have access to these facilities twenty-four hours a day, seven days a week. Graduate students are assigned an individual studio workspace; all students have access to a fully furnished wood shop that is also open evenings and weekends. Students have access to the 3D Fab Lab featuring equipment for three-dimensional milling, scanning, and printing. The studio art computer lab features fully equipped Macintosh graphics workstations and auxiliary hardware and software. Students also have access to the holdings of the Fine Arts Library, housed in the E. William Doty Fine Arts Building. Additionally, students have access to the cultural materials available for study at the Harry Ransom Research Center for the Humanities, to the circulating materials available at the Materials Lab in the School of Architecture, and to the exhibitions and collections of artworks housed at the Blanton Museum of Art.

The area studios contain the following facilities: for painting, well-ventilated, well-lit, individual studios within a communal suite; for photography, individual studios and access to the wet black-and-white and digital darkrooms with their attendant equipment; for printmaking, individual studios and access to the well-equipped print studio including presses for lithography, intaglio and serigraphy; for sculpture, private studios and access to fabrication facilities for casting, welding, and moldmaking; and for transmedia, a group studio with access to the performance facility with green screen and the computer lab with image processors, video cameras, video mixers with chroma-key functions, 16-mm film and digital multimedia equipment, and audio equipment.

## **Areas of Study**

The interdisciplinary studio art graduate program is structured around five studio areas: painting, photography, printmaking, sculpture, and transmedia. Students are encouraged to practice across disciplines or conversely, to master a single area of studio practice. The curriculum is designed to privilege studio time while also delving into the academic riches available at the University of Texas. The course of study includes individual and group critiques, seminars taught by artists or art historians or other arts professionals, and discussions with visiting artists and critics. Students select a committee of three to four graduate faculty for whom, each semester, they present their work in service of a discussion and evaluation of their progress.

## **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Troy D Brauntuch	Leslie A Mutchler
Sarah A Canright	Bogdan P Perzynski
Lee R Chesney III	Edwin L Rifkin
Anna Collette	John Risley
Sandra Fernandez	Margo L Sawyer
Amy Hautt	Michael Smith
Timothy G High	John S Stoney
Teresa Hubbard	Daniel D Sutherland
Beili Liu	Jeff Williams
Kristin Lucas	John A Yancey
Michael J Mogavero	

## **Admission Requirements**

The applicant must be an early-career artist with a bachelor's degree in studio art. Applicants with bachelor's degrees in other fields will be considered if they have completed substantial coursework in studio art and art history or if their portfolio proves demonstrated interest and accomplishment in studio art. Students apply to up to two of the five specializations and submit online a twenty-image portfolio representing a coherent body of work made within the previous two years. Transmedia applicants must submit work online and may also provide additional materials on DVD or USB flash drive. Full application instructions are available on the program's Web site. (<http://www.utexas.edu/finearts/aah/admissions/graduate>)

## **Degree Requirements**

The student must begin coursework in the fall semester. The program requires the completion of the following sixty semester hours over a period of two years in residence: thirty-two to thirty-five hours of studio coursework, three hours in art history and/or criticism, eight hours in studio seminars, four hours in professional practice seminar, three hours in a Master's portfolio report, four hours in a Master's exhibition seminar, and six hours in approved elective courses in support of the student's

studio research. In addition, students must pass a review by faculty committee at the end of each semester. The thirty-hour midpoint review is presented before all studio art Graduate Studies Committee faculty and studio art graduate students while the other semester-end reviews are private. The final review takes place at the thesis exhibition. All students publicly present their work during a colloquium at the thesis exhibition.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Studio Art: ART

#### **ART 380, 480. Group Critique in Studio Art.**

Group critiques of student artwork organized under the leadership of the instructor, in addition to regular individual studio visits between the instructor and each student. For each semester hour of credit earned, one lecture hour a week for one semester with additional laboratory hours to be arranged. May be repeated for credit. Prerequisite: Graduate standing in studio art and consent of the graduate adviser.

#### **ART 181, 281, 381, 481, 581, 681, 781. Graduate Committee Study.**

Studio hours to be arranged. May be repeated for credit. Prerequisite: Graduate standing in studio art and consent of instructor and the graduate adviser.

#### **ART 382. Seminar in Studio Art.**

Addresses topics and issues in contemporary art. Uses lectures, readings, guest presentations, discussions, and writings to articulate and define contemporary art practices. Three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing in studio art and consent of the graduate adviser.

#### **ART 482T. Topics Seminar in Studio Art.**

Topics and issues in contemporary art. Lectures, readings, guest presentations, discussions, and writings provide an opportunity for students to discuss the production and reception of culture. Four lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in studio art and consent of the graduate adviser.

#### **ART 383, 483. Graduate Independent Study Outside Student's Concentration.**

Studio hours to be arranged. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

#### **ART 384F, 484F. Master of Fine Arts First-Year Seminar.**

Restricted to first-semester graduate students in studio art. Introduction to the extensive research assets of the University. Focus on critical assessment skills and developing effective and consistent habits for working in the studio. For each semester hour of credit earned, one lecture hour a week for one semester. Prerequisite: Graduate standing in studio art and consent of the graduate adviser.

#### **ART 384S. Master of Fine Arts Assembly.**

Restricted to second-semester graduate students in studio art. Continuation of Studio Art 384F. Focuses on critiquing skills, talking and writing about artwork, and defining effective studio practices. Students

work with peers and faculty from across the studio disciplines. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and Studio Art 384F with a grade of at least B.

#### **ART 390. Advanced Issues in Studio Art.**

Restricted to graduate students in design or studio art. Intensive advanced study of various disciplines of studio art. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, consent of graduate adviser, and consent of instructor.

#### **ART 490T. Advanced Issues in Studio Art.**

Restricted to graduate students in design or studio art. Intensive advanced study of various disciplines of studio art. The equivalent of two lecture hours a week and four laboratory hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, consent of graduate adviser, and consent of instructor.

#### **ART 398P, 498P. Professional Practices for Fine Artists.**

Restricted to second-year studio art graduate students. Study of effective strategies for entering various aspects of the art world. Experiences may include lectures, guest specialists, field trips, and readings. For each semester hour of credit earned, one lecture hour a week for one semester. Prerequisite: Graduate standing in studio art and consent of instructor and the graduate adviser.

#### **ART 398R. Master's Portfolio Report.**

Written interpretation of the artwork created in the graduate program, addressing influences on and concepts of the work, and including a digital portfolio of major works and influences. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in studio art, concurrent enrollment in Studio Art 398S, and consent of the graduate adviser.

#### **ART 398S, 498S. Master's Exhibition Seminar.**

Preparation for the presentation of a professional exhibition in which significant work from each student is displayed. The exhibition is curated by the instructor with all students collaborating in its execution. The students' final sixty-hour review takes place during the exhibition and is individually conducted by faculty committee. At a later date during the exhibition, students publicly discuss and present their work in a colloquium open to the public. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in studio art, concurrent enrollment in Studio Art 398R, and consent of the graduate adviser.

#### **ART 398T. Teaching Methodologies in Studio Art.**

Training in teaching methods and procedures for studio art classes, including weekly group meetings with the instructor and individual consultations. Three lecture hours a week for one semester. Prerequisite: Graduate standing in studio art, or graduate standing and appointment as a teaching assistant; and consent of the graduate adviser.

## Theatre and Dance

*Master of Arts (Theatre)*  
*Master of Fine Arts (Dance)*  
*Master of Fine Arts (Theatre)*  
*Doctor of Philosophy (Theatre)*

### For More Information

**Campus address:** F. Loren Winship Drama Building (WIN) 1.142, phone (512) 471-5793, fax (512) 471-0824; campus mail code: D3900



**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Theatre and Dance, 300 East 23rd Street Stop D3900, Austin TX 78712

**E-mail:** pc@austin.utexas.edu

**URL:** <http://www.finearts.utexas.edu/tad/>

## Facilities for Graduate Work

The rare and unique materials in the Performing Arts Collection of the Harry Ransom Center, along with the collections in the Fine Arts Library and other units of the University Libraries, constitute one of the most extensive research facilities in the country. The Department of Theatre and Dance also maintains a collection of historical clothing for research purposes. The theatrical production facilities of the Performing Arts Center, described in the Fine Arts (p. 188) section, are unsurpassed.

## Areas of Study

**Master of Arts.** The Master of Arts with a major in theatre is offered in two areas: performance as public practice, and teacher training. The Master of Arts in performance as public practice is appropriate preparation for doctoral study; the Master of Arts in teacher training is an appropriate terminal degree.

**Master of Fine Arts.** The Master of Fine Arts is offered in both theatre and in dance. The major in theatre includes five areas: drama and theatre for youth and communities, playwriting, directing, performance as public practice, and theatrical design/technology. The Master of Fine Arts provides advanced training for those specializing in one of the performing arts. It is an appropriate terminal degree in these areas.

**Doctor of Philosophy.** The doctoral degree in theatre is offered in performance as public practice. The program requires competence in research and allows the student to develop both a broad understanding of the field, including practical skills, and in-depth knowledge of a specialized area.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Megan Alruz	Omi Osun Joni L Jones
Charles O Anderson	David Justin
Paul A Bonin	Joan Lazarus
Charlotte Canning	Kirk E Lynn
Pamela D Christian	Susan E Mickey
Kathryn M Dawson	Francie Ostrower
Douglas J Dempster	Deborah A Paredez
Steven Dietz	Brant Pope
Franchelle Dorn	Robert Ramirez
Lucien Douglas	Sarah M Rasmussen
Stephen T Gerald	Rebecca Rossen
James J Glavan	Roxanne Schroeder-Arce
Laura G Gutierrez	Lisa Thompson
Michelle Habeck	Holly A Williams
Barney Hammond	Lyn C Wiltshire
Richard M Isackes	

## Admission Requirements

**Master's degrees.** The applicant must have a bachelor's degree and must have demonstrated interest and experience in theatre and/or dance. The Graduate Record Examinations General Test (GRE) is required for admission to these areas: drama and theatre for youth and communities,

playwriting, directing, and performance as public practice. The GRE is not required for admission to dance or theatrical design/technology.

**Doctoral degree.** Students admitted to the doctoral program must hold a master's degree from an accredited institution. All applicants must submit GRE scores.

## Degree Requirements

**Master of Arts.** Of the thirty semester hours required for the degree, no more than nine hours may be in upper-division courses. At least fifteen hours must be in the major; at least six must be outside the major. A written thesis is required, for which the student earns six hours of credit in Theatre and Dance 698. Other coursework is determined following an evaluation of the student's background and preparation.

**Master of Fine Arts.** Of the sixty semester hours required for the degree, no more than nine may be in upper-division courses. A minor of at least six hours in a supporting subject or subjects outside the major field is required. A thesis is required, for which the student earns six hours of credit in Theatre and Dance 698. Other coursework is determined following an evaluation of the student's background and preparation.

The requirements for the Master of Fine Arts are based on the assumption that the entering student has a Bachelor of Arts degree in theatre or dance. Students with degrees in other disciplines may not have the necessary training or proficiency for some areas of the Master of Fine Arts program. They may be required to take additional upper-division coursework in those areas.

Students with a Bachelor of Fine Arts degree may have training and proficiency beyond those of Bachelor of Arts graduates. These students may be granted waivers of some credit hours. Waivers are awarded only after careful evaluation by the faculty of the student's previous training and experience. No more than twenty semester hours of credit may be waived.

**Doctor of Philosophy.** The student's program of study, including coursework and other requirements to be met, must be approved by a committee appointed by the chair of the Graduate Studies Committee. Each student must demonstrate reading competence in two foreign languages, or in-depth knowledge of one foreign language. The student must pass qualifying examinations, write an acceptable dissertation, and pass an oral examination related to the dissertation. Detailed information about the requirements is available from the graduate adviser.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Theatre and Dance: T D

#### T D 280G. Production Skills for Actors.

Laboratory hours as required. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, a major in acting, and consent of instructor.

#### T D 680M. Performance Studio.

Exploration and practice in the skills and craft of acting, voice, dance, directing, and playwriting. Twenty laboratory hours a week for one

semester, with additional laboratory hours as required. May be repeated for credit when the projects vary. Prerequisite: Graduate standing and consent of instructor.

### **T D 380N. Topics in Acting.**

Topics, restricted or broad in scope, related to the theory of acting, stage combat, movement, and voice. Laboratory hours as required. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **T D 180P, 280P, 380P. Advanced Projects in Performance.**

Projects inappropriate to organized courses but pertinent to students' training and development in acting, directing, dance, and playwriting. For each semester hour of credit earned, the equivalent of one class hour a week for one semester, with laboratory hours as required. May be repeated for credit when the projects vary. Prerequisite: Graduate standing and consent of instructor.

### **T D 381D. Seminar in Directing Theory.**

Application of aesthetic and creative principles to directing theory; application of directing theory to textual analysis and production concept. Three lecture hours a week for one semester, with additional laboratory hours as required. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **T D 381E. Topics in Directing Theory.**

Topics, restricted or broad in scope, related to the theory of directing. Three lecture hours a week for one semester, with additional laboratory hours as required. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **T D 381F. Advanced Acting and Directing.**

Problems in the theory and practice of acting and directing for the theatre. Three lecture hours a week for one semester, with additional laboratory hours as required. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, a major in acting, and consent of instructor.

**Topic 1: Advanced Acting.** Full exploration of the sources of dramatic action that reside in the self.

**Topic 2: Classical Acting.** Training in the acting skills needed for the performance of Shakespeare and other verse dramatists.

**Topic 3: Voice Studies I.** Training the actor in vocal coaching, voice anatomy, muscularity of speech, and vocal health.

**Topic 4: Voice Studies II.** Application of vocal techniques. Additional prerequisite: Theatre and Dance 381F (Topic 3).

### **T D 481G. Advanced Acting and Directing Laboratory.**

Practical application of acting and directing techniques for the theatre. Twelve laboratory hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, a major in acting, and consent of instructor.

**Topic 1: Voice, Speech, and Movement I.** The basics of speech, phonetics, and mind and body awareness for the actor.

**Topic 2: Voice, Speech, and Movement II.** The physical side of acting, and articulation as it is applied to various types of text. Additional prerequisite: Theatre and Dance 481G (Topic 1).

**Topic 3: Voice, Speech, and Movement III.** Stage dialects and physical character development. Additional prerequisite: Theatre and Dance 481G (Topic 2).

**Topic 4: Voice, Speech, and Movement IV.** Individual research projects and advanced movement techniques. Additional prerequisite: Theatre and Dance 481G (Topic 3).

**Topic 5: Acting for the Camera.** Fundamentals of on-camera acting techniques.

**Topic 6: Acting Showcase.** Scenes and monologues to be used in the New York and Los Angeles evaluation showcases.

**Topic 7: Directing.** Practical application of directing techniques for the theatre.

### **T D 381J. Directing: Modern Drama.**

Theory, analysis, and practice in directing plays from the modern period. Three lecture hours a week for one semester, with laboratory hours as required. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **T D 381L. Directing: Period Drama I.**

Theory, analysis, and practice in directing plays from historical periods of drama. Three lecture hours a week for one semester, with laboratory hours as required. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **T D 381M. Directing: Period Drama II.**

Continuation of Theatre and Dance 381L. Theory, analysis, and practice in directing plays from historical periods of drama. Three lecture hours a week for one semester, with laboratory hours as required. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **T D 382K. Seminar in Secondary School Theatre Curriculum.**

Theory and design of secondary school theatre curriculum. Three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing, secondary school teacher certification, and consent of instructor.

### **T D 383M. Topics in Theatre Outreach.**

Topics, restricted or broad in scope, related to the theory and practice of theatrical outreach. Three lecture hours a week for one semester, with laboratory hours as required. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Theatre Outreach Methods.** Theory and design of a variety of outreach offerings.

### **T D 183N, 283N, 383N. Theatre Outreach Practicum.**

Practical application of theatre outreach methods in communities. For each semester hour of credit earned, the equivalent of one class hour a week for one semester, with laboratory hours as required. May be repeated for credit when the projects vary. Prerequisite: Graduate standing and consent of instructor.

### **T D 383P. Topics in Drama and Theatre for Youth.**

Topics pertinent to students' training and development in drama and theatre for youth. Three lecture hours a week for one semester, with laboratory hours as required. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Puppetry.** Design, construction, and performance of puppets in children's theatre.

**Topic 2: Children's Dramatic Literature.** Comprehensive study of dramatic literature for children.

**Topic 3: Children's Dramatic Literature--International.** Comprehensive study of international dramatic literature for children. Material is studied in translation.

**Topic 4: Theatre in Education.** Theory and practice of interactive theatre in education.

**Topic 5: Creative Drama.** Advanced theory and practice of creative drama in field and educational settings.

**Topic 6: Practicum in Drama and Theatre for Youth.** Practical applications of approaches to drama and theatre for youth.

**Topic 7: Youth Theatre Tour.** Rehearsal, production, and performance of theatre for children in schools.

**Topic 8: Issues and Practices in Youth Theatre.** Issues in professional and community theatres for children.

**Topic 9: Special Problems: Directing for Young Audiences.** Challenges in staging plays for young audiences.

**Topic 10: Myth, Legend, and Tale.**

**Topic 11: Creative Drama in the Museum.** The application of creative drama methods in museum settings.

#### **T D 184, 284, 384. Special Problems in Theatre and Dance.**

For each semester hour of credit earned, the equivalent of one class hour a week for one semester, with laboratory hours as required. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

#### **T D 385C. Topics in Theatre History.**

Topics, restricted or broad in scope, chosen from the history of theatre, both Western and non-Western. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Theatre History, 1660-1900.**

**Topic 2: Medieval and Renaissance Theatre History.** European theatrical history from the medieval and Renaissance periods.

**Topic 3: Classical and Asian Theatre History.** Survey of ancient Greek, Roman, and Asian theatrical history.

**Topic 4: 20th-Century Theatre History.**

**Topic 5: French Theatre, 1945-2000.**

**Topic 6: Contemporary Theatre History.**

#### **T D 385D. Topics in Dramaturgy.**

Topics pertinent to students' training and development in dramaturgical theory and practice. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Dramaturgy.**

**Topic 2: New Play Dramaturgy.**

**Topic 3: Production Dramaturgy.**

#### **T D 386. Topics in Dance.**

Topics pertinent to students' training and development in dance and choreography. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Dance in Academia.**

#### **T D 386C. Topics in the History, Theory, and Criticism of Dance.**

Topics pertinent to students' training and development in the history and theory of dance and choreography. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

#### **T D 186D, 286D, 386D, 486D. Dance Technique.**

Training in ballet, modern, and other forms of dance. For each semester hour of credit earned, the equivalent of one class hour a week for one semester, with laboratory hours as required. May be repeated for credit when the projects vary. Prerequisite: Graduate standing and consent of instructor.

#### **T D 387D. Topics in Performance Studies.**

Topics, restricted or broad in scope, related to performance studies. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Applied Drama and Theatre.** Survey of various applications of drama and theatre for communitarian and educational purposes.

**Topic 2: Performance Analysis.**

**Topic 3: Performance Ethnography.**

**Topic 4: Performing Autobiography.** The overlapping territory between performing the self and performing the biographical other.

**Topic 5: Seminar in Theatre History and Performance Studies.**

**Topic 6: Historical Case Studies.**

**Topic 8: Women and American Performance.**

**Topic 9: Adaptation for Stage and Screen.**

**Topic 10: Performance and Politics in the 1960s.**

**Topic 11: Performative Criticism.**

**Topic 12: Performing Black Feminisms.**

**Topic 13: Theatre of the Oppressed.** Overview of the movement inspired by Augusto Boal's Theatre of the Oppressed.

**Topic 14: American Musical Theatre.**

**Topic 15: Body, Culture, and Performance.**

**Topic 16: Dance, Women, and Narrative.**

**Topic 17: Feminist Theory and Performance.**

**Topic 18: Performance and Activism.**

**Topic 19: Performance and Cultural Studies.**

**Topic 20: Performance Theory Analysis.**

**Topic 21: Performative Writing.**

**Topic 22: Performing America, 1840-1940.**

**Topic 23: Queer Performance and Theory.** Current theories and practices of queer performance.

#### **T D 387M. Topics in Dramatic Theory and Criticism.**

Topics, restricted or broad in scope, concerning theory and criticism as they relate to drama or theatre. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Dramatic Theory and Criticism, Ancient Greece to the Eighteenth Century.**

**Topic 2: Dramatic Theory and Criticism, the Eighteenth Century to 1960.**

**Topic 3: World Theatre in Context.** Practical application of dramaturgical case study for the actor.

#### **T D 387N. Topics in Dramatic Form and Structure.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

#### **T D 387P. Playwriting Workshop.**

Theory and practice of dramatic writing. Three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

#### **T D 387R. Playwriting For Youth.**

Advanced study and practice of writing plays for children and youth. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### **T D 388. Research Methods and Resources.**

Theory and practice of academic research for theatre artists. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **T D 388J. Advanced Design and Technology Studio.**

Problems in the theory of scenic design, costume design, lighting design, and theatre technology. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Costume Design.**

**Topic 2: Costume Technology.**

**Topic 3: Lighting Design.**

**Topic 4: Scenic Design.** Designed primarily for students studying scenic design. Fundamentals of scenic design.

**Topic 5: Theatre Technology.** Theory and application of the technical direction process.

### **T D 488K. Advanced Design and Technology Laboratory.**

Practical applications of production theory for theatrical designers and technicians. Laboratory hours as required. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Lighting Laboratory.** Practical and individual design experience in lighting.

**Topic 2: Technology Laboratory.** Practical and individual design experience in theatrical technology.

**Topic 3: Scenery Laboratory.** Practical and individual design experience in scenery.

**Topic 4: Costuming Laboratory.** Practical and individual design experience in costuming.

### **T D 388L. Advanced Topics in Design and Technology.**

Topics that are related to and support the study of theatrical design and technology. Three lecture hours a week for one semester, with laboratory hours as required. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Costume Rendering.** Fundamentals of costume research and drawing.

**Topic 2: Drawing for Theatre Designers.** Fundamentals of drawing and drafting for theatrical designers.

**Topic 3: Painting.** Painting techniques for theatrical designers.

**Topic 4: Automated Lighting I.** Fundamentals of automated and computer-aided lighting for theatre and live performance.

**Topic 5: Mask Making I.** Fundamentals of mask theory, design, and construction for theatre and live performance.

**Topic 6: Advanced Makeup.** Advanced theatrical makeup theory and techniques.

**Topic 7: Fabric Painting and Dyeing I.** Fundamentals of textile surface design.

**Topic 9: Draping I.** Basic clothing construction for theatrical productions.

**Topic 10: Draping II.** Advanced clothing construction for theatrical productions.

**Topic 11: Mask Making II.** Mask theory, design, construction for theatrical and live productions.

**Topic 12: Automated Lighting II.** Advanced automated and computer-aided lighting theory and techniques.

**Topic 13: Scenic Rendering.**

**Topic 14: Millinery I.** Fundamentals of hat design, fitting, and construction techniques.

**Topic 16: Rigging for the Theatre.** Historical and modern practices of theatrical rigging systems.

**Topic 17: Tailoring I.** Fundamental theory and techniques in tailoring for the live performer.

**Topic 18: Tailoring II.** Advanced theory and techniques in tailoring for the live performer.

**Topic 19: Concert Lighting.** Use of automation, computers, and remote control in lighting for live performance. Taught in San Jose, Costa Rica.

**Topic 23: Fabric Painting and Dyeing II.** Advanced textile surface design.

**Topic 24: Millinery II.** Advanced hat design, fitting, and construction techniques.

**Topic 25: Audio Production.** Fundamentals of audio production for the stage and other live performances.

**Topic 26: Costume Design Skills.** Fundamentals of research, drawing, rendering, and script and character analysis and critique for costume design.

**Topic 27: Lighting Design Skills.** Fundamentals of research, paperwork communication, and technology for lighting designers.

**Topic 28: Scenery Design Skills.** Fundamentals of drawing, drafting, and model building for theatrical designers.

**Topic 29: Figure and Fabric Rendering.** Principles of figure and fabric painting from life.

**Topic 30: Scene Painting.** Scene painting techniques for theatrical designers.

### **T D 188M, 288M, 388M. Advanced Projects in Design and Technology.**

Advanced independent study projects in scenic design, costume design, lighting design, and theatre technology. For each semester hour of credit earned, the equivalent of one class hour a week for one semester, with laboratory hours as required. May be repeated for credit when the projects vary. Prerequisite: Graduate standing and consent of instructor.

### **T D 388R. Research and History for the Visual Theatre.**

Study of the development of dress and decor, as seen in a general historical context, with an introduction to research methods appropriate for theatrical designers and technicians. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **T D 390. Advanced Playwriting Workshop.**

Advanced study and practice of dramatic writing. Three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing, Theatre and Dance 387P, and consent of the instructor.

### **T D 190K. Play Readings.**

Weekly readings of plays in various stages of development. One lecture hour a week for one semester, with laboratory hours as required. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **T D 390L. New Playwriting Studio.**

Three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **T D 190M, 290M, 390M. New Works Projects.**

Independent study projects in the production of new work. For each semester hour of credit earned, the equivalent of one class hour a week for one semester, with additional laboratory hours as required. May be repeated for credit when the projects vary. Prerequisite: Graduate standing and consent of instructor.

### **T D 391. Topics in Performance as Public Practice.**

Topics, restricted or broad in scope, related to performance as public practice. Three meeting hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Historiography.** The history of history, in practice, as a discipline, and in writing.

**Topic 2: Proseminar: Performance as Public Practice.**

**Topic 3: Public Intellectuals and the Arts.**

**Topic 4: Community-Based Theatre.** The practice of theatre as a tool for community and social change.

**Topic 5: Cultural Policy and the Arts.**

#### **T D 392, 692, 992. Graduate Internship in Theatre.**

Participation and observation as a working member of a theatre or theatre-related organization. Laboratory hours as required by the sponsor. The amount of credit awarded is commensurate with the duties of the internship. Offered on the credit/no credit basis only. Prerequisite: Completion of one year of a graduate degree program in the Department of Theatre and Dance, consent of instructor, approval of the faculty of the student's area of study, and approval of the Internship Committee of the Graduate Studies Committee.

#### **T D 393. Seminar in Theory, Criticism, and Analysis.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

#### **T D 395. Readings in History, Theory, Criticism, and Performance Studies.**

In-depth exploration of literature in specialized areas of interest, primarily as preparation for doctoral examinations and dissertation proposals. Conference course equivalent to three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

#### **T D 195P, 295P, 395P. Advanced Projects in Performance Studies.**

Advanced independent study projects in performance studies, theatre history, theory, criticism, performance as public practice, drama and theatre for youth, theatre outreach, and dramaturgy. For each semester hour of credit earned, the equivalent of one class hour a week for one semester, with laboratory hours as required. May be repeated for credit when the projects vary. Prerequisite: Graduate standing and consent of instructor.

#### **T D 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For Theatre and Dance 698A, graduate standing and consent of the graduate adviser; for 698B, Theatre and Dance 698A (or Drama 698A).

#### **T D 398T. Supervised Teaching in Theatre and Dance.**

Theory and practice of pedagogy in theatre and dance. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **T D 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

#### **T D 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Theatre and Dance 399R, 699R, or 999R.

## **John A. and Katherine G. Jackson School of Geosciences**

## **Energy and Earth Resources**

*Master of Arts*

*Master of Science in Energy and Earth Resources*

### **For More Information**

**Campus address:** E. P. Schoch Building (EPS) 1.144, phone (512) 471-9875, fax (512) 471-5585; campus mail code: C9000

**Mailing address:** The University of Texas at Austin, Energy and Earth Resources, 2275 Speedway Stop C9000, Austin TX 78712

**E-mail:** [jsmith@jsg.utexas.edu](mailto:jsmith@jsg.utexas.edu)

**URL:** <http://www.jsg.utexas.edu/eer/>

### **Facilities for Graduate Work**

The program in energy and earth resources is interdisciplinary. The facilities of the Departments of Geological Sciences, Petroleum and Geosystems Engineering, Economics, Government, and Geography and the Environment, the Lyndon B. Johnson School of Public Affairs, and the McCombs School of Business are available. Materials located in the Walter Geology Library, the McKinney Engineering Library, and the Perry-Castañeda Library include an array of specialized publications, such as the contract research of the United States Department of Energy and its predecessors, a selective collection of United States and Texas government documents, conference proceedings, and society and association publications. In addition, a wide range of electronic information resources in science, business, and the social sciences is accessible through the University Libraries Web site (<http://www.lib.utexas.edu>).

### **Areas of Study**

Graduate study in energy and earth resources includes study in geological sciences, petroleum and geosystems engineering, economics, resource management, government, law, and policy studies. The student's program should represent as broad a spectrum as possible of energy and earth resources courses.

### **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Ross Baldick	Krishan A Malik
J Eric Bickel	James T O'Connor
John C Butler	Jon E Olson
James S Dyer	Suzanne A Pierce
John S Dzienkowski	Varun Rai
David J Eaton	Kamy Sepehrnoori
William L Fisher	John M Sharp Jr
Charles E Gholz	David B Spence
Genaro J Gutierrez	Ronald J Steel
Charles Kerans	Scott W Tinker
Carey W King	Carlos Torres-Verdin
J Richard Kyle	Michael E Webber
Larry W Lake	Michael Howard Young
Stephen E Laubach	

### **Admission Requirements**

The entering student who wishes to pursue an advanced degree in energy and earth resources should have a bachelor's degree in one of the participating disciplines. Each advanced degree program is designed to provide a broad acquaintance with energy and earth resources problems,

both from a technological and from a business, economic, law, or policy perspective.

## Degree Requirements

### Master of Arts

The Master of Arts degree in energy and earth resources is intended for those who seek to build critical knowledge and skills with qualitative underpinnings, and who desire to take graduate coursework and conduct a thesis project along the lines of the types carried out in the areas of business, humanities, law, liberal arts, policy, and some technical fields. Candidates for the Master of Arts degree must complete thirty semester hours of graduate-level coursework, three of which may be at the upper-division undergraduate level with approval by the graduate adviser. Students who have not previously completed coursework in the geological sciences (including the origin of energy, mineral, and water resources) are required to take Energy and Earth Resources 396, *Seminar in Energy and Earth Resources* or Geological Sciences 386R, *Geology of Earth Resources*. The thesis counts for six of the thirty semester hours required for the degree. The remainder of hours required for the degree may be chosen from a list of approved courses in the fields of business, engineering, law, liberal arts, policy, and science.

### Master of Science in Energy and Earth Resources

The Master of Science in Energy and Earth Resources degree is intended for those who seek a quantitative underpinning for their graduate work and who desire to conduct a thesis project that is research-based, along the lines of those prepared in engineering and the sciences. Candidates for the Master of Science in Energy and Earth Resources degree must complete thirty semester hours of graduate-level coursework, three of which may be at the upper-division undergraduate level with approval by the graduate adviser. Students who have not previously completed coursework in the geological sciences (including the origin of energy, mineral, and water resources) are required to take Energy and Earth Resources 396, *Seminar in Energy and Earth Resources* or Geological Sciences 386R, *Geology of Earth Resources*. The thesis counts for six of the thirty semester hours required for the degree. Nine of the remaining hours required for the degree must be in approved coursework of a quantitative or analytical nature.

### Dual Degree Programs

The program in energy and earth resources offers the following dual degree programs in cooperation with the Lyndon B. Johnson School of Public Affairs and the McCombs School of Business. More information is available from the graduate adviser in each program.

Field(s) of Study	Degree(s)
Business administration	Master of Business Administration
Global policy studies	Master of Global Policy Studies
Public affairs	Master of Public Affairs

### Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## Energy and Earth Resources: EER

### EER 194, 294, 394. Directed Readings in Energy and Earth Resources.

Restricted to students in the energy and earth resources program. Energy, water, and environmental issues related to the exploration, production, and consumption of energy in society. For each semester hour of credit earned, one lecture hour a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### EER 396. Seminar in Energy and Earth Resources.

Graduate seminar covering a wide range of issues in energy and earth resources. Three lecture hours a week for one semester, with additional hours for some topics. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Energy and Earth Resource Economics.** Same as Petroleum and Geosystems Engineering 383 (Topic 60: Energy and Earth Resource Economics). Theoretical and applied topics in natural resource economics, including project analysis, production theory, industrial organization, markets and regulation, and environmental economics. Additional prerequisite: Graduate standing in computational and applied mathematics, engineering, or geological sciences. Students seeking to enroll in this course must present technical prerequisites satisfactory to the instructor.

**Topic 2: Business, Finance, and Management.**

**Topic 3: Policy and Law.**

**Topic 4: Resource Economics and Econometrics.**

**Topic 5: Geology of Earth Resources.** Same as Geological Sciences 386R. Study of geologic, economic, societal, and environmental issues related to the production and consumption of energy, metal, industrial mineral, and water resources. Emphasizes the descriptive geology and origin of earth resources within the context of their overall geologic settings. Three lecture hours and one laboratory hour a week for one semester. Only one of the following may be counted: Energy and Earth Resources 396 (Topic: Geology of Earth Resources), 396 (Topic 5), Geological Sciences 386R, 391 (Topic: Geology of Earth Resources). May not be counted toward a graduate degree in geological sciences or petroleum engineering. Offered on the letter-grade basis only.

### EER 698. Thesis.

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in energy and earth resources, at least nine semester hours of coursework in the energy and earth resources program, and consent of the graduate adviser; for 698B, Energy and Earth Resources 698A.

## Geological Sciences

Master of Arts  
Master of Science in Geological Sciences  
Doctor of Philosophy

### For More Information

**Campus address:** John A. and Katherine G. Jackson Geological Sciences Building (JGB) 2.120, phone (512) 471-6098, fax (512) 471-9425; campus mail code: C1100

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Geological Sciences, 2275 Speedway Stop C1100, Austin TX 78712

**E-mail:** [geograd@maestro.geo.utexas.edu](mailto:geograd@maestro.geo.utexas.edu)

**URL:** <http://www.jsg.utexas.edu/>

## Facilities for Graduate Work

Austin provides an ideal base from which to conduct research projects in all aspects of geological science. The University's central Texas location gives students ready access to exposures of Phanerozoic siliciclastic and carbonate strata and Precambrian igneous and metamorphic basement rocks. The presence of a karst aquifer beneath the city of Austin allows students to study issues related to urbanization, the demand for water, and contamination. Field-intensive studies for master's and doctoral degrees are continually in progress in Texas and in many other states. Field research is currently being conducted on every continent and ocean basin.

Analytical facilities are comprehensive and up-to-date. The electron-microbeam laboratory houses a JEOL JXA-8200 electron microprobe with five wavelength-dispersive spectrometers and an energy-dispersive spectrometer, as well as a Phillips/FEI XL30 environmental scanning electron microscope and a JEOL T330A scanning electron microscope, both of which are equipped for energy-dispersive chemical analysis, cathodoluminescence imaging and spectroscopy, and orientational analysis using electron backscatter diffraction. Two inductively coupled plasma mass spectrometers are available for elemental and isotopic analysis of diverse geologic materials: a Micromass magnetic-sector multicollection device with nine Faraday cups, a Daly ion-counting channel, and three ion-counting channeltrons; and an Agilent quadrupole device. Both instruments can be interfaced with a Merchantek 213-nm-wavelength laser-ablation unit for spatially resolved analysis. These instruments are complemented by a Finnigan-MAT 261 thermal ionization mass spectrometer with seven Faraday cups and one ion-counting channel. Ultraclean laboratories support preparation of samples for rubidium-strontium, uranium-lead, U-series disequilibrium dating, samarium-neodymium, and other isotopic analysis. Additional geochemical instrumentation includes two VG gas-source mass spectrometers for hydrogen, oxygen, nitrogen, and carbon stable-isotope analysis, and a Micromass Multiprep automated preparation system for water and carbonate analyses.

The Department of Geological Sciences houses a dual high-resolution X-ray computed tomographic scanner used for nondestructive three-dimensional visualization and analysis of the internal structure of geologic samples; a Siemens D500 X-ray diffractometer with Datascan automation software and JADE pattern analysis; and a paleomagnetic laboratory with a shielded room, 2G cryogenic magnetometer, Bartington susceptibility meter, and ASC impulse magnetizer. Special microscopy facilities incorporate an Edge R400 real-time high-resolution three-dimensional light microscope; a USGS-type gas-flow fluid inclusion stage; and a Technosyn luminoscope. Among additional facilities are a 1-m x 1.5-m x 10-m flume for sediment transport studies and an experimental petrology laboratory containing hydrothermal pressure apparatus and one-atmosphere gas-mixing furnaces.

Geophysical research employs portable multichannel seismographs with vertical and three-component geophones; a ground-penetrating radar system; a LaCoste-Romberg gravimeter; an airborne Optech LIDAR system for fine-scale topographic mapping; an Optech ILRIS tripod-mounted laser scanning system for very-high-resolution outcrop topography; five portable broadband Guralp seismographs for teleseismic studies; two Vibroseis seismic sources, for both low- and high-frequency three-axis shaking; ten dual-frequency geodetic-quality GPS receivers with choke-ring antennas; portable field magnetometers; and an aerogeophysical instrument package (radar, gravity, LIDAR, magnetometers) most often used in Antarctica. A field site south of San Antonio is available for calibration and testing of seismic instruments and techniques. Graduate students are frequent members of scientific crews on vessels of the University-National Oceanographic Laboratory

System and of other nations, and students regularly conduct fieldwork in Antarctica using National Science Foundation Polar Programs facilities.

Facilities for data processing, data interpretation, and numerical simulation are extensive. There are multiple workstation clusters with Sun and SGI hardware, as well as Windows and Macintosh systems. Most major commercial software packages for seismic data processing and interpretation are available, along with software for GIS, potential field, synthetic aperture radar, and other applications.

The two research components of the Jackson School—the Bureau of Economic Geology and the Institute for Geophysics—are housed in adjoining buildings on the J. J. Pickle Research Campus. The two units contribute the expertise of more than fifty research scientists to the Jackson School. The bureau functions as the state geological survey for Texas and sells many different types of publications to the public. The institute includes the Hockley Seismic Station, located in Hockley, Texas, just north of Houston. The station, part of the IRIS Global Seismic Network, houses a broadband seismometer that collects information on global as well as Texas seismic events.

Reference materials include the 165,000-item Joseph C. and Elizabeth C. Walter Geology Library and Tobin International Map Collection, both located in the John A. and Katherine G. Jackson Geological Sciences Building. Research collections of about one million vertebrate paleontology specimens and about four million nonvertebrate specimens, including a type collection of about five thousand specimens, are housed at the J. J. Pickle Research Campus. The Bureau of Economic Geology maintains three major core storage facilities, containing nearly two million boxes of core and cuttings, mostly from North American sedimentary basins. The bureau also maintains a collection of nearly one million electric logs from Texas oil and gas wells.

Research support is provided by a well-equipped petrographic laboratory with a separate thin-section laboratory for student use, a machine shop, and an electronics shop. The department's staff includes analytical chemists, computer support specialists, a petrographic section technician, a computer graphics specialist, a photographer, and a machinist.

## Areas of Study

Areas of active research in the Department of Geological Sciences include studies in sedimentary depositional systems; hydrogeology; climate systems science; structural geology; marine geology and geophysics; regional tectonics; seismology; paleomagnetism; seismic reflection and refraction; isotope and aqueous geochemistry; sedimentary geochemistry; geomicrobiology; igneous, sedimentary, and metamorphic petrology; high-temperature geochemistry; ore deposits and industrial mineral resources; and vertebrate and invertebrate paleontology. Cooperative research projects are under way with the Center for Space Research, the Institute for Geophysics, and the Bureau of Economic Geology.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

James A Austin Jr	Martin P Jackson
Nathan L Bangs	Xavier Janson
Jay L Banner	Joel Peterson Johnson
Jaime D Barnes	Charles Kerans
Whitney Behr	Richard A Ketcham
Christopher J Bell	Wonsuck Kim
Phillip C Bennett	Gary A Kocurek
Donald D Blankenship	J Richard Kyle
Daniel O Breecker	John C Lassiter
Meinhard Bayani Cardenas	Stephen E Laubach
Ginny A Catania	Luc L Lavier
Elizabeth J Catlos	Jung-Fu Lin
Julia A Clarke	Robert G Loucks
Mark P Cloos	Randall A Marrett
Kerry H Cook	Rowan Clare Martindale
Ian W Dalziel	Timothy A Meckel
Robert E Dickinson	David Mohrig
Peter Eichhubl	Sharon Mosher
William L Fisher	Terrence M Quinn
Peter B Flemings	Harold D Rowe
Sergey B Fomel	Timothy B Rowe
Clifford A Frohlich	Bridget R Scanlon
Rong Fu	Mrinal K Sen
Craig S Fulthorpe	Timothy M Shanahan
James E Gardner	John M Sharp Jr
Omar Ghattas	Kyle Thomas Spikes
John A Goff	Ronald J Steel
Stephen P Grand	Daniel Stockli
Sean S Gulick	Scott W Tinker
Bob A Hardage	Harm J Van Avendonk
Marc A Hesse	Clark R Wilson
John W Holt	Zong-Liang Yang
Brian K Horton	Michael Howard Young

## Admission and Degree Requirements

The preliminary education of students who intend to become candidates for a graduate degree in geological sciences usually includes coursework in general geology, paleontology, mineralogy, petrology, structural geology, and field geology, as well as physics, chemistry, and calculus. Geophysicists and climatologists are expected to have a sound foundation in both mathematics and physics; paleontologists should include suitable preparation in the comparative morphology and genetics of living organisms. Students without the necessary foundation for advanced study and research may be required to take additional coursework.

The department offers both the Master of Science in Geological Sciences and the Master of Arts. The Master of Science in Geological Sciences requires twenty-four semester hours of coursework and a thesis; it is designed for those planning doctoral study or seeking employment in which research and problem-solving skills are essential.

The Master of Arts degree program requires thirty hours of coursework and a report; it is designed for students who wish to enhance their technical education. The Master of Arts programs in hydrogeology and petroleum geology require the student to take courses chosen from a list available from the graduate adviser. In other disciplines, Master of Arts degree programs are designed by petition to the graduate adviser.

Degree programs for the Master of Science in Geological Sciences and the Doctor of Philosophy are designed for each student by his or her committee.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Geological Sciences: GEO

#### GEO 380C. Advanced Structural Geology.

Origin of earth structures, solution of advanced structural problems, newest techniques, field techniques, and field problems. Three lecture hours a week for one semester. Normally offered in the fall semester only. Prerequisite: Graduate standing and consent of instructor.

#### GEO 380F. Seismology II.

Basic seismology theory and its application to the study of the interior of the Earth (crust, mantle, and core), earthquakes, and plate tectonics. Three lecture hours a week for one semester. Normally offered in the fall semester only. Prerequisite: Graduate standing, and Mathematics 408C or the equivalent.

#### GEO 380G. Construction and Interpretation of 3-D Stratigraphy.

Uses three-dimensional volumes of basin-filling stratigraphy to explore how depositional landscapes are preserved in the sedimentary record and how sedimentary deposits can be analyzed to produce quantitative reconstructions of past environmental states. Four lecture hours a week for one semester. Prerequisite: Graduate standing.

#### GEO 380J. Mathematical Methods in Geophysics.

Vectors and matrices, linear algebra, complex variables and contour integration, integral transforms, partial differential equations of geophysics (Laplace, Poisson, and acoustic wave equations), and simple solutions. Three lecture hours a week for one semester. Normally offered in the fall semester only. Geological Sciences 366M and 380J may not both be counted. Prerequisite: Graduate standing.

#### GEO 380N. Sequence Stratigraphy.

Organization and interpretation of stratigraphic successions in time-bounded units of genetically related strata. Sequence stratigraphy, as a predictive branch of stratigraphic analysis, provides insight into the origin of the entire spectrum of siliciclastic, carbonate, and evaporite sediments from shallow to deep settings. Laboratory component involves the interpretation of sequences using outcrop measured sections, core data, wireline log sections, field trips, and 2D and 3D seismic data from modern and ancient settings. Three lecture hours and one and one-half laboratory hours a week for one semester. Normally offered in the spring semester only. Prerequisite: Graduate standing, and Geological Sciences 416M and 465K or their equivalents.

#### GEO 380P. Advanced Reservoir Characterization: Carbonates.

Advanced instruction in the integration of geologic and engineering methods for building 3-D reservoir models of carbonate reservoirs. Four lecture hours a week for one semester. Offered in alternate years. Geological Sciences 380P and 391 (Topic: Advanced Reservoir Characteristics: Carbonates) may not both be counted. Prerequisite: Graduate standing.



### **GEO 380R. Dynamics of Sedimentary Systems I.**

Explores the fundamental concepts of transport systems at the Earth's surface, focusing on principles and quantitative aspects of fluid flow, sediment transport, and bedforms, as well as atmospheric and oceanic circulation, complex systems, and the integration of small-scale processes in developing quantitative stratigraphic models. Four lecture hours a week for one semester. Prerequisite: Graduate standing.

### **GEO 380S. Dynamics of Sedimentary Systems II.**

Explores the fundamental concepts of transport systems at the Earth's surface, focusing on principles and quantitative aspects of fluid flow, sediment transport, and bedforms, as well as atmospheric and oceanic circulation, complex systems, and the integration of small-scale processes in developing quantitative stratigraphic models. Four lecture hours a week for one semester. Prerequisite: Graduate standing and Geological Sciences 380R.

### **GEO 380T. Geoclimatology.**

Examines climate records encoded in sedimentary archives through geologic time. Three lecture hours a week for one semester. Normally offered in the fall semester only. Prerequisite: Graduate standing or consent of instructor.

### **GEO 381C. Structural Petrology.**

Deformation processes from atomic to macroscopic level, resultant textures and fabrics, and conditions required to produce such deformation. Three lecture hours and three laboratory hours a week for one semester. Normally offered in the spring semester only, in alternate years. Prerequisite: Graduate standing and an undergraduate course in structural geology and petrology.

### **GEO 381E. Brittle Structure.**

Quantitative analysis of folding, faulting, and fracturing at all scales in the upper crust, with emphasis on cross-section construction, subsurface mapping, and fracture analysis. Three lecture hours a week for one semester, and several field trips. Normally offered in the spring semester only, in alternate years. Prerequisite: Graduate standing and a course in structural geology.

### **GEO 381G. Geomicrobiology.**

Geologic and hydrologic controls on subsurface microbial growth, metabolism, and community structure; the geochemical consequences of microbial processes in subsurface settings; and the influence of geology on microbial ecology. Three lecture hours a week for one semester. Normally offered in the fall semester only, in alternate years. May not be substituted for any required geological sciences course. Geological Sciences 341G and 381G may not both be counted. Prerequisite: Graduate standing in geological sciences, or graduate standing and consent of instructor.

### **GEO 381K. Tectonic Problems.**

Origin of regional structural features, complex and controversial structures; tectonic control of ore deposits. Three lecture hours a week for one semester. Offered irregularly. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in geological sciences and consent of instructor.

### **GEO 381P. Plate Margins.**

Study of the tectonics of the earth. Topics include history of early concepts, ocean spreading ridges and ophiolites, rifting, core complexes, passive margins, subduction zones, trenches, volcanic arcs, collisional orogenesis, and transform margins. Three lecture hours a week for one semester. Normally offered in the spring semester only. Geological

Sciences 381P and 391 (Topic: Plate Margins) may not both be counted. Prerequisite: Graduate standing in geological sciences.

### **GEO 381R. Regional Studies in Mineral Resources Geology.**

Geologic evolution of a region, with emphasis on factors that control the origin of selected mineral resources. Study area varies according to the interests of participants and other factors. Three lecture hours a week for one semester. Normally offered in the spring semester only. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **GEO 381T. Marine Tectonics.**

Tectonic processes within the dynamic Earth, with a focus on oceanic structures. Subjects may include fundamentals of plate tectonics; plate motion, driving forces, and mantle convection; evolution of triple junction and plate margins; plate reconstructions; earthquakes and focal mechanisms; structure and geochemistry of the Earth's interior; mantle structure and tomography; rheology and deformation mechanisms in mantle and crust; heat flow, gravity, the geoid, and paleomagnetism; hotspots and mantle plumes; seafloor spreading and oceanic spreading ridges; oceanic transform faults and fracture zones; and subduction zones, volcanic island arcs, and marginal seas. Three lecture hours a week for one semester. Normally offered in the spring semester only. Only one of the following may be counted: Geological Sciences 338T, 371C (Topic: Tectonics I), 381T, 391 (Topic: Tectonics I). May not be substituted for any required geological sciences course. Prerequisite: Graduate standing in geological sciences, or graduate standing and consent of instructor.

### **GEO 382C. Groundwater Field Methods.**

Basic field methods used in evaluation of groundwater conditions, with emphasis on field interpretation and on hands-on experience with geophysical, geochemical, stream-gauging, and pump test methods. Forty-five hours of field and laboratory work in a three-week period. Normally offered in the summer session only. Prerequisite: Graduate standing, and Geological Sciences 391C or consent of instructor.

### **GEO 382D. Crustal Geofluids.**

Designed to provide a technical foundation for exploring how fluids drive fundamental geologic processes in sedimentary basins. Includes characterizing pressure and stress in sedimentary basins, exploring the origin of overpressure through theory and characterization, and examining how pressure and stress couple. Problems include how sedimentation generates overpressure, how hydrocarbons are trapped in the subsurface, how mud volcanoes form, how submarine landslides are generated, and the origin of methane hydrates. Three lecture hours per week for one semester, with a four-day field trip to be arranged during spring break. Normally offered during the spring semester. Geological Sciences 382D and 391 (Topic: Crustal Fluids) may not both be counted. Prerequisite: Graduate standing.

### **GEO 382F. Fractured Rock Hydrology and Mechanics.**

Introduction to the physics of flow in fractured rocks and soils; fracture mechanics; fracture skins; analysis of solute transport; and methods of characterizing and modeling fractured systems. Class field trips are an integral part of the class. Three lecture hours a week for one semester, with field trips to be arranged. Offered irregularly. Prerequisite: Graduate standing in geological sciences and consent of instructor. Previous coursework in hydrogeology (such as Geological Sciences 476K or the equivalent) and mathematics (such as Mathematics 427K or the equivalent) is recommended.

### **GEO 382G. Fluid Physics for Geologists.**

Flow and transport phenomena within an earth science context. Includes extensive use of Maple, MATLAB, and COMSOL Multiphysics. Three

lecture hours a week for one semester. Normally offered in the spring semester only, in alternate years. Prerequisite: Graduate standing in geological sciences or graduate standing and consent of instructor; and Geological Sciences 346C or 391C, 383D or 383E, and Mathematics 408D, 408L, or 427K.

### **GEO 382M. Programming in FORTRAN and MATLAB.**

FORTRAN for students without knowledge of a computer programming language: survey of all variable types, loops, arrays, subroutines, and functions; overview of UNIX and MATLAB. Two lecture hours and two laboratory hours a week for one semester. Normally offered in the spring semester only. Geological Sciences 382M and 391 (Topic: Programming in FORTRAN and MATLAB) may not both be counted. Prerequisite: Graduate standing, and Mathematics 408D or the equivalent.

### **GEO 382S. Physical Hydrology.**

Comprehensive treatment of modern conceptual and methodological approaches to hydrological science. Combines qualitative understanding of hydrological processes with quantitative representation, approaches to measurement, and treatment of uncertainty. Major components of the hydrological cycle. Three lecture hours and two laboratory hours a week for one semester. Normally offered in the fall semester only. Prerequisite: Graduate standing in geological sciences, or graduate standing and consent of instructor.

### **GEO 382T. Continental Tectonics.**

Tectonic processes, with a focus on continental lithospheric structures. Subjects may include convergent margins, subduction zones, magmatic arcs, and foreland structures; collisional orogenesis, arc-continent collisions, continent-continent collision, and mountain building; formation of supercontinents; uplift and exhumation; orogenic collapse and extensional tectonics; continental rifting and passive margins; transform margins; and the effect of tectonics on climate and oceanic circulation. Three lecture hours a week for one semester. Normally offered in the fall semester only. Only one of the following may be counted: Geological Sciences 339T, 371C (Topic: Tectonics II), 382T, 391 (Topic: Tectonics II). May not be substituted for any required geological sciences course. Prerequisite: Graduate standing in geological sciences, or graduate standing and consent of instructor.

### **GEO 382W. Hydrogeophysics.**

Application of geophysical methods in hydrogeology. Modules include method theory and hydrogeological applications; using instruments in the field; and analysis of data, interpretation, and hydrogeological insights. Class discussions; field exercises and written field exercise summaries; individual and group reports. Three lecture hours a week for one semester, with fieldwork hours to be arranged. Normally offered in the fall semester only. Only one of the following may be counted: Geological Sciences 371C (Topic: Hydrogeophysics), 376W, 382W, 391 (Topic: Hydrogeophysics). Prerequisite: Graduate standing and consent of instructor; previous coursework and/or experience in hydrogeology and geophysics is recommended.

### **GEO 383. Clastic Depositional Systems.**

River-, wave-, tide-, and gravity-driven processes are examined in modern depositional systems and considered in relation to sediment-flux, base-level, and autogenic changes. Application to the development of dynamic facies models and alluvial-shoreline-shelf-deepwater transitions in stratigraphic data. The equivalent of four lecture hours a week for one semester, including a four- to five-day field seminar. Normally offered in the fall semester only. Prerequisite: Graduate standing in geological sciences.

### **GEO 383C. Geology and Hydrology.**

Study of the interaction of fluids with the rock matrix, with emphasis on the role of hydrology in geologic processes and the role of geology in affecting hydrologic processes. Three lecture hours a week for one semester, and several field trips. Offered irregularly. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and a course in hydrogeology or hydrology.

### **GEO 383D. Numerical Methods I: Computational Methods in Geological Sciences.**

A survey of geophysical data analysis methods, with a focus on time series, including sampling and aliasing, convolution and correlation, statistics, linear digital filters, properties and applications of the discrete Fourier transform, and least squares. Instruction in MATLAB and Fortran and solution of data analysis problems using these two languages. Two lecture hours and two laboratory hours a week for one semester. Normally offered in the fall semester only. Prerequisite: Graduate standing.

### **GEO 383E. Digital Methods in Hydrogeology.**

Applications of mathematical software to earth science problems, with emphasis on hydrogeologic problems. Includes a brief introduction to numerical methods. Three lecture hours a week for one semester. Normally offered in the fall semester only. Prerequisite: Graduate standing, Geological Sciences 391C or the equivalent, and Mathematics 408D, 408L, or 427K.

### **GEO 383G. Geochemistry of Sedimentary Rocks.**

The hydrologic cycle, the early diagenesis, carbonate sediments, chemical sediments, and burial processes. Three lecture hours a week for one semester, with laboratory hours to be arranged. Offered irregularly. May be repeated for credit. Prerequisite: Graduate standing.

### **GEO 383K. Paleoecology.**

Relationships of fossil animals and plants to their environments and to the sedimentary deposits in which they occur. Three lecture hours a week for one semester, with one optional field trip. Normally offered in the spring semester only, in alternate years. Prerequisite: Graduate standing.

### **GEO 383L. Petrography of Sandstones.**

Interpretation of microscale features of sandstones to decipher the paleogeographic, tectonic, and postdepositional controls on sandstone composition and texture. Examines the effects of chemical and mechanical processes in the subsurface on sandstone properties, including porosity. Two lecture hours and three laboratory hours a week for one semester. Offered irregularly. Prerequisite: Graduate standing in geological sciences.

### **GEO 383M. Petrology of Carbonates and Evaporites.**

Description and interpretation of carbonate and evaporite rock deposition and paragenesis. Essentials of petrology; petrography, including identification of grain types, cement types, recrystallization, and dolomitization; and porosity evolution. Global geochemical signals in carbonate sediments, and geochemical processes of early and late diagenesis. Three lecture hours and two laboratory hours a week for one semester. Offered irregularly. Prerequisite: Graduate standing.

### **GEO 383N. Depositional Systems: Carbonates and Evaporites.**

Analysis of carbonate and evaporite depositional systems from sedimentary structures, faunal and ichnofaunal associations, grain types, vertical and lateral facies successions within time-significant packages, and sediment body geometries. Three lecture hours and three laboratory hours a week for one semester. Offered irregularly. Prerequisite: Graduate standing and consent of instructor.

### **GEO 383P. Potential Field Applications in Geophysics.**

Introduction to the theory, measurement, and application of gravity and magnetic and electric fields to exploration and global-scale problems. Three lecture hours a week for one semester. Normally offered in the spring semester only. Geological Sciences 365P and 383P may not both be counted. Prerequisite: Graduate standing.

### **GEO 383R. Reservoir Geology and Advanced Recovery.**

Analysis of geologic controls on composition and architecture of oil and gas reservoirs, with emphasis on reservoir heterogeneity resulting from depositional and diagenetic processes. Geological and petrophysical determinants of fluid flows and behavior. Three lecture hours a week for one semester. Normally offered in the fall semester only. May be repeated for credit. Prerequisite: Graduate standing; and credit or registration for Geological Sciences 380N, 383, and 383N, or consent of instructor.

### **GEO 383S. Sedimentary Basin Analysis.**

Quantitative and applied study of basin subsidence and sediment accumulation. The first half of the course considers theoretical basin evolution due to flexural, thermal, dynamic, and fault-related subsidence. The second half of the course involves in-depth analysis of selected basin systems and includes student research projects and presentations on assigned topics. Specific topics vary from year to year. Three lecture hours a week for one semester. Normally offered in the spring semester only. Prerequisite: Graduate standing, and Geological Sciences 383 or the equivalent.

### **GEO 383T. Tectonic and Climatic Interactions in Foreland Basins.**

Integration of recent advances in the understanding of modern and ancient foreland basin sedimentation, quantitative basin modeling, regional and global climate change, and the geometry and kinematics of fold-thrust belts. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **GEO 384C. Seismology I.**

Seismic, gravity, magnetic, electrical, and electromagnetic methods of exploration for petroleum and minerals. Three lecture hours and two laboratory hours a week for one semester. Normally offered in the fall semester only. Prerequisite: Graduate standing.

### **GEO 384D. Physics of Earth.**

Geophysics of the whole Earth: seismic methods of inferring Earth structure, chemical makeup of Earth, tides and rotational variations, geomagnetism, heat flow, earthquakes, and seismicity. Three lecture hours a week for one semester. Normally offered in the spring semester only. Geological Sciences 354 and 384D may not both be counted. Prerequisite: Graduate standing.

### **GEO 384E. Seismic Migration and Inversion.**

Use of the acoustic or elastic wave equation to construct subsurface images in seismic processing. Different methods of solution and data domains employed in routine applications. Investigates integral, implicit, and explicit finite differences and Fourier methods for the imaging and inversion of seismic reflection data. Three lecture hours a week for one semester. Offered irregularly. Prerequisite: Graduate standing in geological sciences.

### **GEO 384F. Computational Methods for Geophysics.**

Numerical methods for solution of partial differential equations arising in continuum geophysics and geodynamics. Focuses on finite element methods and their application to heat conduction, viscous flow, wave propagation, and transport problems in geophysics. Four lecture hours a week for one semester. Geological Sciences 384F and 391 (Topic:

Computational Methods for Geophysics) may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **GEO 384G. Subsurface Mapping and Petroleum Workstations.**

Introduction to basin analysis, subsurface mapping, and petroleum exploration using a workstation. Subjects may include common tectonic settings of petroleum basins, seismic stratigraphy, structural styles, and petroleum systems. Workstation techniques include well log editing, lithology interpretation, correlation of tectonic events, integration of seismic and subsurface well data, interpretation of two- and three-dimensional seismic reflection data and structure, and isopach and seismic attribute mapping. Four lecture hours a week for one semester. Geological Sciences 384G and 391 (Topic: Introduction to Petroleum Workstations) may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **GEO 384M. Inverse Theory.**

Vector spaces; model parameter estimation methods from inaccurate, insufficient, and inadequate measurements; linear, quasi-linear, and highly non-linear problems; local and global optimization methods. Emphasis on practical problem solving. Three lecture hours and two laboratory hours a week for one semester. Normally offered in the spring semester only, in alternate years. Prerequisite: Graduate standing and knowledge of linear algebra, basic calculus, and statistics.

### **GEO 384N. Rock Physics.**

Focuses on how rocks, pore fluids, and physical conditions of temperature, stress, diagenesis, and geological processes impact wave propagation, with an emphasis on how laboratory and theoretical results can be applied to field data. Presentation of case studies that outline strategies for seismic interpretation, site characterization, and recovery monitoring. Upscaling seismic and rock properties from the laboratory scale to borehole and reservoir scales. Multidisciplinary approaches to combination of geostatistical and stochastic methods, seismic-to-rock property transforms, and geologic information for reservoir characterization. Three lecture hours a week for one semester. Geological Sciences 384N and 391 (Topic: Rock Physics) may not both be counted. Prerequisite: Graduate standing.

### **GEO 384R. Geophysical Time Series Analysis.**

Surveys the following topics in time series analysis with geophysical applications: Fourier transforms, linear digital filters and their design, frequency domain analysis methods (power and coherence spectrum estimation), least squares and related methods with time series applications. MATLAB is used extensively. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Geological Sciences 325K or 383D or the equivalent.

### **GEO 384S. Seismic Reflection Processing.**

Reduction of seismic and other geophysical data from field data to final geologic cross sections, using real data sets and commercial seismic processing software. Three lecture hours and two laboratory hours a week for one semester. Offered irregularly. Prerequisite: Graduate standing, and Geological Sciences 384R or the equivalent.

### **GEO 384T. Seismic Lithology.**

How seismic waves propagating through earth materials respond to relevant rock, reservoir, and fluid properties in the subsurface, and how seismic data recorded on the surface are used to describe, discriminate, and estimate these rock, reservoir, and fluid properties in the subsurface. Three lecture hours and one and one-half laboratory hours a week for one semester. Normally offered in the spring semester. Geological Sciences

384T and 391 (Topic: Seismic Lithology and Exploration Geophysics) may not both be counted. Prerequisite: Graduate standing.

### **GEO 384U. Quantitative Seismic Interpretation.**

Seismic inversion, a tool for reservoir characterization, post- and pre-stack modeling, rock physics and fluid replacement modeling, wavelet estimation and post-stack inversion, AVO and pre-stack inversion, multiattribute regression and neural network, and net pay estimation. Extensive hands-on training with three-dimensional seismic and well-log data. Three lecture hours a week for one semester. Normally offered in the spring semester only, in alternate years. Prerequisite: Graduate standing.

### **GEO 384W. Seismic Imaging.**

Seismic reflection imaging for visualizing the interior of Earth's upper crust. Study of fundamental imaging concepts from a unified geometrical point of view. Hands-on practical experience with imaging seismic data in an open-source software environment. Three lecture hours and one laboratory hour a week for one semester. Normally offered in the fall semester only, in alternate years. Geological Sciences 384W and 391 (Topic: Wavefield Imaging) may not both be counted. Prerequisite: Graduate standing; programming experience and familiarity with seismology are helpful.

### **GEO 185G. Geophysics Colloquium.**

Open to non-geological sciences majors, but registration priority is given to geological sciences majors. Exploration of a variety of problems in modern geophysics. Two lecture hours a week for one semester, and at least one weekend field trip. Geological Sciences 185G and 194 (Topic: Geophysics Colloquium) may not both be counted. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **GEO 385Q. Geomorphology Process and Form.**

Explores how Earth surface processes combine to shape landscapes through erosion and deposition. Emphasis on open channel flow, sediment transport, fluvial and hillslope processes, and tectonic controls on landscape evolution. Three lecture hours a week for one semester, with several field trips to be arranged. Normally offered in the fall semester. Only one of the following may be counted: Geological Sciences 365Q, 371C (Topic: Geomorphology: Landscape Process, Form, and Evolution), 385Q, GEO 391 (Topic: Geomorphology: Landscape Process, Form, and Evolution). May not be substituted for any required geological sciences course. Prerequisite: Graduate standing in geological sciences.

### **GEO 386. Metamorphic Petrology.**

Metamorphism as a record of processes in the Earth's deep crust; phase equilibria among minerals and fluids at elevated temperatures and pressures; tectonometamorphic regimes; petrographic interpretation of metamorphic mineral assemblages and textures; and secular evolution of metamorphic patterns during Earth's history. Three lecture hours and three laboratory hours a week for one semester. Normally offered in the spring semester only, in alternate years. Prerequisite: Graduate standing and consent of instructor.

### **GEO 386E. Economic Geology.**

Origin of economic mineral concentrations within the context of their overall geologic settings; geologic aspects of economic evaluation, mining, and mineral processing; and mineral exploration. Three lecture hours and two laboratory hours a week for one semester. Normally offered in the fall semester only. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **GEO 386G. Geographic Information System and Global Positioning System Applications in Earth Sciences.**

Theory and practice of geographic information system (GIS) and Global Positioning System (GPS) technologies, and their applications to problems in earth sciences. Laboratories and field trips provide hands-on experience with the collection, mapping, and analysis of geologic and other field data using GPS equipment and GIS software. Topics include map projections; datums and reference frames; cartographic principles; remotely sensed data (satellite and aerial photos, image radar); vector- and raster-based image formats; geospatial data resources; GIS software applications; surveying principles; GPS constellation and data structure; differential GPS; data logging schemes; GPS postprocessing software; integration of GPS and GIS in mapmaking; extant GIS applications in geology and hydrogeology. Three lecture hours and two laboratory hours a week for one semester, and two weekend field trips. Offered in the fall semester only. Geological Sciences 386G and 391 (Topic: Geographic Information System and Global Positioning System Applications in Earth Sciences) may not both be counted. Prerequisite: Graduate standing in geological sciences and consent of instructor.

### **GEO 386K. Igneous Petrology.**

Origin, differentiation, and crystallization of igneous rocks. Three lecture hours and three laboratory hours a week for one semester. Offered in alternate years. May be repeated for credit. Prerequisite: Graduate standing, and Geological Sciences 390M or the equivalent.

### **GEO 386R. Geology of Earth Resources.**

Same as Energy and Earth Resources 396 (Topic 5: Geology of Earth Resources). Study of geologic, economic, societal, and environmental issues related to the production and consumption of energy, metal, industrial mineral, and water resources. Emphasizes the descriptive geology and origin of earth resources within the context of their overall geologic settings. Three lecture hours and one laboratory hour a week for one semester. Only one of the following may be counted: Energy and Earth Resources 396 (Topic: Geology of Earth Resources), 396 (Topic 5), Geological Sciences 386R, 391 (Topic: Geology of Earth Resources). May not be counted toward a graduate degree in geological sciences or petroleum engineering. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **GEO 386T. Topics in Volcanology.**

Explores the physical and chemical processes involved in the eruption, transport, and deposition of volcanic material through the use and study of field measurements, fluid dynamics, petrology, and geophysical observations. Three lecture hours a week for one semester. Normally offered in the spring semester, in alternate years. Geological Sciences 386T and 391 (Topic: Volcanology) may not both be counted. Prerequisite: Graduate standing.

### **GEO 387C. Chemical Hydrogeology.**

Introduction to the chemistry of water in the subsurface. Topics include basic thermodynamics and kinetics of rock-water interaction, acid-base theory, redox, and coordination chemistry. Three lecture hours and two laboratory hours a week for one semester. Normally offered in the spring semester only. May be repeated for credit. Prerequisite: Graduate standing, a graduate course in hydrogeology, and two semesters of college chemistry.

### **GEO 387D. Climate Dynamics.**

Studies features of the climate system and the basics of climate system dynamics. Subjects may include climate variability, radiation and heat budgets, atmospheric and ocean circulation systems, and the physics of climate change. Three lecture hours a week for one semester. Normally offered in the spring semester only. Only one of the following may be counted: Geological Sciences 371C (Topic: Climate System Science),

387D, 391 (Topic: Climate System Science). May not be substituted for any required geological sciences course. Prerequisite: Graduate standing and three semester hours of upper-division coursework in physics and multivariate calculus.

#### **GEO 387E. Environmental Organic Geochemistry.**

Environmental and organic chemistry of organic contaminants in groundwater and soils. Three lecture hours and one laboratory hour a week for one semester. Offered irregularly. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

#### **GEO 387F. Dynamics of Atmospheres and Oceans.**

Study of fluid dynamics as applied to the atmosphere and oceans, with an emphasis on large-scale processes. Subjects may include vorticity, instability, Ekman dynamics, thermohaline circulation, and waves in the atmosphere and oceans. Three lecture hours a week for one semester. Normally offered in the spring semester only. Geological Sciences 387F and 391 (Topic: Dynamics of Atmospheres and Oceans) may not both be counted. May not be substituted for any required geological sciences course. Prerequisite: Graduate standing; and Geological Sciences 387D or prior coursework in atmospheric dynamics, physical oceanography, or fluid dynamics.

#### **GEO 387G. Climate System Modeling.**

Studies the basic theory of climate system modeling using state-of-the-art regional climate models in a variety of applications. Subjects may include paleoclimate study and future climate prediction based on greenhouse gas increases. Three lecture hours a week for one semester. Normally offered in the spring semester only. Only one of the following maybe counted: Geological Sciences 347G, 371C (Topic: Climate System Modeling), 387G, 391 (Topic: Climate System Modeling). May not be substituted for any required geological sciences course. Prerequisite: Graduate standing, basic knowledge of Unix, and programming experience in Fortran.

#### **GEO 387H. Physical Climatology.**

Investigates the nature of Earth's climate and examines the physical processes that maintain the climate system. Topics include the energy balance, the hydrological cycle, general atmosphere circulation, and how they all interact and vary at various spatial and temporal scales. Discusses human-induced modifications to the climate system, such as urbanization, anthropogenic global warming, desertification, and tropical deforestation. Focuses on descriptive, analytical, programming, and modeling skills. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Computer Science 303E, Geography 301K, Mathematics 408D, and Physics 303K.

#### **GEO 387P. Climate System Physics.**

Discussion of first-order principles and processes that govern the thermodynamical structure and energy distribution of the atmosphere, ocean, land, and cryosphere and their interaction with the dynamic aspect of the climate system. Three lecture hours a week for one semester. Normally offered in the spring semester only. Only one of the following may be counted: Geological Sciences 347P, 371C (Topic: Climate System Physics), 387P, 391 (Topic: Climate System Physics). May not be substituted for any required geological sciences course. Prerequisite: Graduate standing.

#### **GEO 388G. Global Biogeochemical Cycles.**

Examination of the major reservoirs, fluxes, and processes controlling the distribution of biologically active chemical constituents of the earth. The importance of these biogeochemical cycles in the geologic past and the effects of human perturbation of these cycles. Three lecture hours a week for one semester. Normally offered in the fall semester only. Geological Sciences 388G and 391 (Topic: Global Biogeochemical Cycles) may not

both be counted. Prerequisite: Graduate standing in geological sciences, or graduate standing and consent of instructor.

#### **GEO 388H. Environmental Isotope Geochemistry.**

The application of the isotope and trace element geochemistry of natural waters and sediments to studies of the hydrologic cycle. Stable, radiogenic, and cosmogenic isotopes are used as tracers of the evolution of groundwater, surface water, and ocean water. Three lecture hours a week for one semester, with laboratory hours to be arranged. Normally offered in the spring semester only. May be repeated for credit. Prerequisite: Graduate standing.

#### **GEO 388L. Isotope Geology.**

Relation of isotope fractionation to earth processes; age determinations from ratios of unstable isotopes to daughter products; techniques of mass spectrometry. Three lecture hours a week for one semester. Normally offered in the fall semester only. Prerequisite: Graduate standing and consent of instructor.

#### **GEO 388P. Paleontological Laboratory Techniques.**

Overview and application of laboratory techniques used for in-depth investigation of the systematics of vertebrates. Three lecture hours a week for one semester. Geological Sciences 388P and 391 (Topic: Paleontological Laboratory Techniques) may not both be counted. Prerequisite: Graduate standing in geological sciences.

#### **GEO 388R. Radiogenic Isotopes and Tectonic Processes.**

Application of radiogenic isotopes to tectonic problems. Particular attention is given to methods and tools in thermochronology and geochronology for understanding thermal histories, uplift rates, slip rates, timing relationships, landform development, and provenance. Three lecture hours a week for one semester. Offered in alternate years. Prerequisite: Graduate standing.

#### **GEO 388T. High-Temperature Geochemistry.**

An introduction to the application of isotope and trace element geochemistry in the modern geological sciences, with emphasis on problems related to the origin and evolution of the Earth's interior. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **GEO 389K. Paleontologic Nomenclature and Techniques.**

Rules of nomenclature: preparation, illustration, and description of Paleozoic invertebrate fossils. Three lecture hours a week for one semester. Normally offered in the fall semester only, in alternate years. Prerequisite: Graduate standing in geological sciences and consent of instructor.

#### **GEO 389M. Vertebrate Paleontology: Mammals.**

Comparative osteology and phylogenetic history of the living and extinct mammals. Two lecture hours and four laboratory hours a week for one semester. Offered in alternate years. Prerequisite: Graduate standing in geological sciences and Geological Sciences 389V.

#### **GEO 389P. Digital Methods in Morphology.**

The use of digital multimedia for analysis of paleontological problems, with emphasis on three-dimensional high-resolution CT data. One lecture hour and three laboratory hours a week for one semester. Normally offered in the spring semester only, in alternate years. Prerequisite: Graduate standing in geological sciences.

#### **GEO 389R. Morphology of the Vertebrate Skeleton.**

Identification of skeletal elements from the major vertebrate taxa, and aspects of skeletal functional morphology, with emphasis on extant taxa. Topics include the skeletal systems of fishes, amphibians, reptiles, birds, and mammals. Three lecture hours and four laboratory hours a week

for one semester. Normally offered in the fall semester only, in alternate years. Geological Sciences 322V and 389R may not both be counted. Prerequisite: Graduate standing in geological sciences; and Geological Sciences 404C, 405, or the equivalent, or consent of instructor.

### **GEO 389S. Systematics and Paleontology.**

Seminar course focusing on current issues in digital/instructional technologies. Provides students with an opportunity to explore, discuss, and demonstrate issues designing, acquiring, manipulating, authoring, and publishing digital content. Students work toward completing a specific project. Three lecture hours a week for one semester. Offered in alternate years. Geological Sciences 389S and 391 (Topic: Systematics and Paleontology) may not both be counted. Prerequisite: Graduate standing in geological sciences and consent of instructor.

### **GEO 389V. Vertebrate Paleontology.**

Comparative osteology and phylogenetic history of the living and extinct fishes, amphibians, and reptiles. Two lecture hours and four laboratory hours a week for one semester. Normally offered in the spring semester only, in alternate years. Prerequisite: Graduate standing in geological sciences, and Biology 349 or the equivalent.

### **GEO 390D. Seismology III.**

Advanced treatment of elastic wave propagation in heterogeneous anisotropic media, vectors and tensors, Christoffel equation, group and phase velocities, invariant embedding (reflectivity), finite difference, finite elements, and spectral elements. Three lecture hours a week for one semester. Normally offered in the spring semester only, in alternate years. Prerequisite: Graduate standing, and Geological Sciences 380F or the equivalent.

### **GEO 390M. Thermodynamics of Geologic Processes.**

Applications of physical chemistry to natural systems; interactions of minerals, solutions, and the atmosphere. Three lecture hours a week for one semester. Offered in alternate years. Prerequisite: Graduate standing and consent of instructor.

### **GEO 390R. Analytical Methods: Electron-Microbeam Techniques.**

An introduction to electron-microbeam instruments and their applications in the earth sciences. Lectures on relevant theory and concepts are supplemented by hands-on experience. Two lecture hours and three laboratory hours a week for one semester. Prerequisite: Graduate standing in geological sciences or graduate standing and consent of instructor.

### **GEO 390S. Analytical Methods: Mass Spectrometry.**

An introduction to mass spectrometers and their applications in the earth sciences. Lectures on relevant theory and concepts are supplemented by hands-on experience. Two lecture hours and three laboratory hours a week for one semester. Prerequisite: Graduate standing in geological sciences or graduate standing and consent of instructor.

### **GEO 191, 291, 391, 491, 591, 791, 891, 991. Seminar in Geological Sciences.**

For each semester hour of credit earned, the equivalent of one class hour a week for one semester; additional hours may be required for some topics. Offered irregularly. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in geological sciences; additional prerequisites vary with the topic.

### **GEO 391C. Physical Hydrogeology.**

Geological controls on groundwater resources; evaluation of aquifers, geothermal systems, and contamination problems; natural hazards caused by human use of groundwater. Three lecture hours a week for

one semester, with discussion hours to be arranged. Normally offered in the fall semester only. Prerequisite: Graduate standing and concurrent enrollment in Geological Sciences 191W.

### **GEO 391D. Regional Tectonics.**

Development of tectonic theory culminating in the new global tectonics, and application of theory to selected orogenic areas. Three lecture hours a week for one semester. Offered irregularly. Prerequisite: Graduate standing in geological sciences.

### **GEO 391K. Applied Karst Hydrogeology.**

The study of karst landforms, processes, flow systems, and water resources. Geologic controls, natural resources, aquifer recharge and discharge, system evolution, geochemistry/water quality, tracing methodologies, geophysical methods, and modeling are covered with an emphasis on collecting and interpreting field data. Three lecture hours a week for one semester, with additional fieldwork hours to be arranged. Normally offered in the spring semester only. Only one of the following may be counted: Geological Sciences 371C (Topic: Applied Karst Hydrogeology), 377K, 391 (Topic: Applied Karst Hydrogeology), 391K. Prerequisite: Graduate standing, and Geological Sciences 391C or consent of instructor.

### **GEO 391Q. Topics in Quaternary Geology.**

Interdisciplinary analysis of Quaternary chronology, environments, climatic changes, and erosional-depositional processes. Three lecture hours a week for one semester. Offered irregularly. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **GEO 391S. Current Topics in Paleobiology.**

Seminar reviewing recent publications on evolutionary and ecologic theories applied to the fossil record. Three lecture hours a week for one semester. Normally offered in the fall and spring semesters, in alternate years. Prerequisite: Graduate standing.

### **GEO 191W. Aquifer Testing.**

Techniques of aquifer evaluation, including pumping tests, laboratory techniques, field mapping, and numerical analysis. Two laboratory hours a week for one semester. Normally offered in the fall semester only. Geological Sciences 191 (Topic: Aquifer Testing) and 191W may not both be counted. Prerequisite: Graduate standing, and concurrent enrollment in Geological Sciences 391C or consent of instructor.

### **GEO 392M. Modern Geological Sciences.**

General discussion of the entire spectrum of geological sciences. Three lecture hours a week for one semester. Offered in the fall semester only. Geological Sciences 391 (Topic: Modern Geological Sciences) and 392M may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in geological sciences, or graduate standing and consent of instructor.

### **GEO 193. Technical Sessions.**

Attendance required of all graduate students in geological sciences. Two lecture hours a week for one semester. Additional hours may be required. Normally offered in the fall and spring semesters only. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **GEO 194, 294, 394, 494, 594, 694, 794, 894, 994. Research in Geological Sciences.**

Restricted to graduate students in geological sciences. For each semester hour of credit earned, the equivalent of one class hour a week for one semester. Offered every semester. May be repeated for credit when

the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in geological sciences.

### **GEO 397F. Marine Geology and Geophysics Field Course.**

Hands-on, team-based instruction in the collection and processing of marine geological and geophysical data along the Gulf of Mexico coast. Includes classroom, laboratory, and field components in Austin and at sea. Offered between the spring semester and the summer session; limited class meetings may begin in the spring semester. Only one of the following may be counted: Geological Sciences 348K, 397F, Marine Science 348 (Topic 2: Marine Geology and Geophysics Field Course). Prerequisite: Graduate standing.

### **GEO 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in geological sciences and consent of the graduate adviser; for 698B, Geological Sciences 698A.

### **GEO 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in geological sciences and consent of the graduate adviser.

### **GEO 298T. Supervised Teaching in Geological Sciences.**

Open to graduate students engaged in laboratory instruction under close supervision of the course instructors. Two lecture hours a week for one semester. Normally offered in the fall semester only. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and appointment as a teaching assistant.

### **GEO 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **GEO 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Geological Sciences 399R, 699R, or 999R.

## **School of Information Identity Management and Security**

*Master of Science in Identity Management and Security*

### **For More Information**

**Campus address:** UT Administration Building (UTA) 5.202, phone (512) 471-3821, fax (512) 471-3971; campus mail code: D8600

**Mailing address:** The University of Texas at Austin, School of Information, 1616 Guadalupe, Room 5.202, D8600, Austin TX 78701

**E-mail:** [info@msims.ischool.utexas.edu](mailto:info@msims.ischool.utexas.edu)

**URL:** <http://www.ischool.utexas.edu/>

### **Facilities for Graduate Work**

Facilities for students in the School of Information include an Information Technology Laboratory, a computer classroom, conservation and preservation laboratories, a video-editing suite, multimedia teaching stations in all classrooms, and access to a usability and accessibility laboratory. Students have access to advanced computer equipment and

software for instructional and research use, supplementing the school's physical and wireless network and computer facilities. Students receive a full-service Internet account and have access to various computer operating systems, such as Macintosh, Windows, and Linux.

## **Areas of Study**

The Master of Science in Identity Management and Security at the School of Information and the Center for Identity educates professionals who engage identity management and security at all levels of responsibility. The School of Information and the Center for Identity manage the program and cooperate in its planning and execution. The degree program offers a holistic, interdisciplinary curriculum ensuring that professionals from multiple market sectors, roles, and levels of responsibility acquire the knowledge and skills necessary to be effective stewards of Personal Identifiable Information (PII). Graduates of the program will be leaders of technological, policy, legal, and societal initiatives to advance identity management, security and privacy.

The two-year executive program provides graduate education for professionals while they continue their careers. Classes meet on one Friday and Saturday each month for five semesters. Students complete a master's report under the guidance of program faculty members in their sixth semester. Students may participate in classes on campus or via distance learning, using synchronous online technologies. All students are required to attend a one-week program orientation on campus before beginning their first semester.

The Master of Science in Identity Management and Security leverages the depth and breadth of expertise that exists both within the School of Information and within the academic units the School collaborates with at The University of Texas at Austin in order to deliver an interdisciplinary program that addresses all aspects of identity information management and security. Coursework includes courses in technology, law, public policy, communications, social and cultural perspectives on identity, and business.

## **Degree Requirements**

The program requires thirty semester hours of graduate coursework, including a master's report.

## **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

The GSC Committee list was not available at publication time; please check directly with the department for an up-to-date list.

## **Information Studies**

*Master of Science in Information Studies  
Doctor of Philosophy*

### **For More Information**

**Campus address:** UT Administration Building (UTA) 5.202, phone (512) 471-3821, fax (512) 471-3971; campus mail code: D8600

**Mailing address:** The University of Texas at Austin, School of Information, 1616 Guadalupe Stop D8600, Room 5.202, Austin TX 78701

**E-mail:** [info@ischool.utexas.edu](mailto:info@ischool.utexas.edu)

**URL:** <http://www.ischool.utexas.edu/>

## Accreditation

The University's program for the degree of Master of Science in Information Studies is accredited by the American Library Association. (The ALA does not concern itself with accrediting programs at levels other than the master's degree.) The programs for the certification of learning resources personnel are accredited by the National Council for Accreditation of Teacher Education and approved by the State Board for Educator Certification.

## Facilities for Graduate Work

Facilities for students in the School of Information include an Information Technology Laboratory, a computer classroom, conservation and preservation laboratories, a video-editing suite, multimedia teaching stations in all classrooms, and access to a usability and accessibility laboratory. Students have access to advanced computer equipment and software for instructional and research use, supplementing the school's physical and wireless network and computer facilities. Students receive a full-service Internet account and have access to various computer operating systems, such as Macintosh, Windows, and Linux.

The school has developed ongoing, competitive student positions with the University Libraries, the Tarlton Law Library, the Dolph Briscoe Center for American History, and the Harry Ransom Humanities Research Center to provide students with work and study opportunities.

## Areas of Study

The School of Information offers education in the human and social aspects of information across its full life cycle, from creation through use and preservation. Students may select coursework from any area to best suit their career plans. The school emphasizes the following three key areas:

**Organization.** To have value for humans and organizations, the vast array of information resources must be organized and managed. From the creation of organizational schemata and catalogs to the analysis of structures in language and data, information specialists have developed techniques and tools to support the location, management, and use of information. This area is designed so that students may learn the intellectual foundations of information organization and the technical skills required to analyze collections of both textual and nontextual materials for human use.

**Interaction.** People interact with information resources through a variety of technologies and through other people. Creating meaningful and effective interaction requires an understanding of how people think and reason, how they behave in specific contexts, and how the interfaces between people and information can best be designed. This area is designed so that students may learn to understand human needs and dispositions in information contexts and develop the methodological skills needed to help develop information interfaces that work well for all people.

**Curation.** Information resources require careful stewardship to ensure their long-term preservation. This process involves assessing the value of information to future users and ensuring appropriate interventions for quality control and the migration of collections across technological platforms and over time. This area is designed so that students may learn how to appraise records, how archives and other collections are created and managed, and how best to preserve physical and digital records.

Graduates in this area generally have many career options and may find employment in libraries (both public and academic), archives, information technology firms, government agencies, museums, and large companies that have significant records and data to manage. Increasing employment

options in the information design and user experience domains are also anticipated.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

William F Aspray Jr	James L Howison
Diane E Bailey	Barbara F Immroth
Lecia J Barker	Unmil P Karadkar
Randolph G Bias	Matthew A Lease
Tanya Elizabeth Clement	Loriene Roy
Andrew P Dillon	Ciaran Trace
Philip Doty	Byron C Wallace
Melanie Diane Feinberg	Jo Lynn Westbrook
Kenneth Robert Fleischmann	Karen M Wickett
Patricia K Galloway	Bo Xie
Jacek Gwizdka	Yan Zhang

## Admission and Degree Requirements

### Master of Science in Information Studies

A student seeking to enter the program must submit an application for admission to the Graduate School. He or she must also supply the School of Information with satisfactory letters of reference from three persons attesting to the applicant's character, scholarly ability, and professional promise. Find more information on admission procedures here (<http://www.ischool.utexas.edu/admissions>).

Facility in the use of computers and networked communication is essential in professional work in information studies. This facility may be acquired through coursework in the school, but prior knowledge of computer applications is important to success in the program. Computer and Internet application tutorials are available online.

The master's degree program entails forty semester hours of graduate and upper-division coursework (not more than nine hours of the latter). At least twenty-eight hours must be in information studies courses, including certain required courses. Up to twelve hours, depending on the student's background and objectives, may be in closely related courses in other subject areas. These courses must augment professional preparation; they do not ordinarily constitute a minor field in the degree program. A student's choice of courses must have the explicit approval of the student's adviser.

Students conclude their studies with a capstone experience designed to enable them to integrate their professional education with the intellectual and institutional vocations toward which they are striving. Students fulfill this requirement by engaging in experiences that result in completion of one of four options: Information Studies 388L, *Professional Experience and Project*, Information Studies 398R, *Master's Report*, Information Studies 388R, *Practicum in School Libraries*, or Information Studies 698, *Thesis*.

Applicants for degree candidacy are required to have an overall grade point average of at least 3.00 in their MSInfoStds coursework. Within the overall grade point average, applicants must have an average of at least 3.00 in all information studies courses, including those not listed on the Application for Degree Candidacy. Additionally, students must earn a grade of B or higher in all required core courses. High grades in courses outside information studies do not serve to offset an average of less than 3.00 in information studies. However, high grades in information studies may raise the overall average. Information studies courses that are to



be listed on the Application for Degree Candidacy may not be taken on the credit/no credit basis. Exceptions to this rule are Information Studies 181E, 388L, 388R, 698, and 398R.

## Doctor of Philosophy

Incoming students are expected to have an educational background that prepares them for their doctoral study. The elements of that background may vary depending on the area of research to be pursued and its associated methodology. Applicants who are admitted without this background may be asked to take additional coursework as part of their doctoral studies.

The objective of the doctoral program is to prepare graduates to contribute to the discipline through research and creative leadership. Emphasizing research, the program allows students to pursue advanced studies in the information discipline and in related subject areas, to study appropriate method and theory, and to learn to engage in advanced research by carrying out a guided and supervised dissertation project. The program is interdisciplinary; students must take courses from other University offerings to supplement those in the School of Information.

Students must complete at least thirty-nine semester hours of coursework, consisting of nine hours of required seminars, twelve hours of methods courses, nine hours of required electives in the student's major area within the school, and nine hours of elective courses from outside the school.

Students must also pass a qualifying examination before being admitted to candidacy. Finally, students must complete and defend a dissertation representing an original contribution to knowledge in the discipline.

Detailed information is available at the School of Information's Web site (<http://www.ischool.utexas.edu/programs/phd.php>).

## Certificate Programs

The school offers a general certificate of advanced study (CAS) and endorsement of specialization (EOS) that can be tailored to meet the individual needs of experienced information professionals.

The CAS is designed for students who want either (1) to extend their study beyond the required forty semester credit hours, or (2) already hold a master's degree in library and information studies or cognate fields and want to update and expand their education and skills, and/or develop proficiencies in preparation for specialized positions and activities. The CAS requires a minimum of twelve semester hours of coursework; more hours may be necessary depending on the student's academic background and professional goals.

The EOS formally recognizes students who create programs of study concentration within the forty semester credit hours required for the Master of Science in Information Studies. The endorsement attests that students have successfully completed twelve semester credit hours of planned, cohesive study.

Certificates may also be completed while studying for the Master of Science in Information Studies. Students interested in pursuing a certificate program must have their plan of study approved by the graduate adviser. Specific course requirements for both certificates are available from the School of Information.

## Dual Degree Programs

The School of Information offers the following dual degree programs in cooperation with other divisions of the University. More information is available from the graduate adviser in each program.

Field(s) of Study	Degree(s)
Global policy studies	Master of Global Policy Studies
Latin American studies	Master of Arts
Law	Doctor of Jurisprudence
Middle Eastern studies	Master of Arts
Public affairs	Master of Public Affairs
Women's and gender studies	Master of Arts

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Information Studies: INF

#### INF 380C. Information in Social and Cultural Context.

Examines the role of information in human activities, particularly in relation to particular social and cultural contexts. Examines how individuals, groups, organizations, institutions, and society at large create, find, use, understand, share, transform, and curate information. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### INF 380D. Designing Dynamic Web Pages.

Principles and practices for designing, developing, and evaluating interactive desktop and mobile Web pages. Theories and models for color, styles, and interactive page elements, such as forms. Students create and evaluate Web pages using current technologies, such as XHTML/HTML5, CSS, JavaScript, AJAX, and Adobe Flash. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### INF 380E. Perspectives on Information.

Multidisciplinary and historical examination of concepts of information. Contrasts key literature from information studies with perspectives from other fields. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### INF 380K. Internet Applications.

Introduction to Internet concepts, protocols, applications, and services. Examines the impact of policy and management decisions on current and future developments, and studies the design and implementation of Internet applications, including HTML, CSS, and related tools. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### INF 380P. Introduction to Programming.

Restricted to students in the School of Information Studies. Introduction to common concepts and constructs of modern computer programming such as classes and objects, methods, inheritance, data types, variables, operators, procedures, and code libraries. Development of programmatic solutions to specific computing problems and design applications for modern computing platforms such as desktop, tablet, mobile, and the World Wide Web. Intended for students with no significant prior programming experience. Three lecture hours a week for one semester. Only one of the following may be counted: Information Studies 380P, 383P, 385T (Topic: Introduction to Programming). Prerequisite: Graduate standing and consent of instructor.

#### INF 181, 281, 381. Individual Studies.

In-depth study of a problem or topic related to information studies, usually culminating in an examination or a scholarly written report. Individual

instruction. With consent of the graduate adviser, may be repeated for credit. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **INF 181E. Electronic Portfolio.**

Creation of a Web site that displays the student's professional aims, interests, and pursuits, including resume and work samples. Designed to be taken during the final semester of the Master of Science in Information Studies degree program. Individual instruction. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and concurrent enrollment in one of the following: Information Studies 388L, 388R, 698B, 398R.

### **INF 381W. Advanced Problems in Information Studies.**

Study of a problem or topic related to information studies. Web-based instruction; no class meetings. With consent of the graduate adviser, may be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **INF 382C. Understanding and Serving Users.**

Overview of human-computer interaction, understanding client groups, information filters, information literacy and information-seeking behavior, as well as user studies and usability testing. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 382D. Introduction to Information Resources and Services.**

Major reference resources and strategies useful in providing information services in libraries and other information agencies. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 382E. Materials for Children.**

A survey of children's literature; materials in various formats suitable for use by and with children. Evaluation tools, application of selection and evaluation criteria, and planning for the use of materials. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 382F. Materials for Young Adults.**

Evaluation, selection, and use of books and other media to meet the needs of young adults of middle-school and high-school age. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 382G. Information Resources and Services for Children and Young Adults.**

Examines the evaluation, selection, and use of books and other media for young adults of junior and senior high school age. Briefly surveys the reading experience, psychology of adolescence, and reading interests of young adults. Includes extensive reading and viewing. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **INF 382H. Legal Information Resources.**

Identification of relevant legal information resources, efficient retrieval of legal information, and the role of technology in legal information access. Three lecture hours a week for one semester. Information Studies 382H and 382L (Topic: Legal Information Resources) may not both be counted. Prerequisite: Graduate standing.

### **INF 382K. Information Resources in the Health Sciences.**

Evaluation of conventional and online health information resources used by consumers and health care professionals for health promotion and disease and disorder prevention, diagnosis, treatment, and management. Includes traditional and alternative approaches, genetic clinical information approaches, and evidence-based approaches to

the use of resources. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 382L. Information Resources and Services.**

Evaluation and use of printed online information resources and services in specialized areas, with emphasis on new information technologies. Information-seeking behavior of users, document delivery, new roles of the information specialist in user support, and information needs of a variety of clients. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **INF 382N. Information Resources in Business.**

Communication patterns, bibliographic organization, and information resources in business and industry. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 382P. Competitive Intelligence Resources and Strategies.**

Resources and strategies for market and competitive analysis. Research and analysis of market trends and financial, technical, and cultural strengths and weaknesses of companies. Online, print, and primary research and analytical techniques. Ethics, process, and presentation are emphasized. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 382R. Introduction to Scientific Data Informatics.**

Introduction to the characteristics of scientific data and the emerging practices applied toward their management and preservation. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 382S. Library Instruction and Information Literacy.**

History of instruction in information service settings; learning theory, including learning styles; professional organizations involved in supporting instruction; instructional delivery modes and materials; and evaluation. Three lecture hours a week for one semester. Prerequisite: Graduate standing. Information Studies 382D is strongly recommended.

### **INF 382T. Information Services: Theory, Techniques, and Subject Areas.**

Exploration of reference services; and evaluation and use of printed and online information resources and services, with emphasis on interpersonal communication and new information technologies. Information needs and information-seeking behavior of users; and new roles of the information specialist in user services. Includes information resources and services in the humanities and social sciences. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 382U. Digital Resources for Children and Youth Seminar.**

Exploration of digital information resources available for children and youth, including the range of content and availability, how information resources are conceived and created, and the implications of these resources for school and public libraries. The equivalent of three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 382V. Visual Resources for Youth Seminar.**

The history and selection criteria of the Caldecott Award; the history of picture books and publishing; academic and professional literature about children's materials; and selection criteria for picture books, including evaluating children's literature and developing the tools to analyze picture books for narrative, artistic, and compositional elements. Illustrative techniques and their effectiveness in relation to particular texts. The equivalent of three lecture hours a week for one semester. Prerequisite: Graduate standing.

**INF 383D. Mathematical Foundations of Information Studies.**

Introduction to traditional finite mathematical concepts, including probability distributions and models, linear equations, matrix algebra, linear statistical models, basic information theory, and the use of mathematical and statistical software for modeling and data analysis. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**INF 383E. Interpreting Implicit Information on the Web.**

Theories and methods of Internet language and image interpretation. Examines persuasion, group and individual identity projection, and group-value demonstration. Focuses on how discourse is shaped by ideology, social forces, and the knowledge and beliefs of its producers within several information contexts, such as online communities, education, science, and healthcare. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**INF 383H. Introduction to Digital Humanities.**

A hands-on introduction to guiding infrastructural and institutional developments involved in digital scholarship. Areas of focus include archives, collection, and scholarly editions; data curation; funding; text encoding; tool building; scholarly publishing; and visualization. Three lecture hours a week for one semester. Information Studies 383H and 385T (Topic: Introduction to Digital Humanities) may not both be counted. Prerequisite: Graduate Standing.

**INF 383S. Library Information Science, Espionage, and Intelligence Gathering.**

Examines the historical and conceptual linkages between the field of library information science and the practices of intelligence gathering and espionage. Explores the role and structure of the intelligence community, the similarities and contrasts between intelligence practitioners and other information professionals, and historical case studies that illuminate areas of overlap and cooperation between the disciplines. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**INF 384C. Organizing Information.**

Introduction to the concepts of information organization, representation, and classification. Consideration of different traditions of practice and user concerns. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**INF 384D. Collection Management.**

Philosophical and social context, objectives, and methodology of evaluating, selecting, and managing library materials. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**INF 384F. Seminar in Information Organization.**

Critical, in-depth examination of significant concepts in information organization. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**INF 384H. Concepts of Information Retrieval.**

Foundations and emerging areas of research in information retrieval and filtering, including system evaluation, major underlying models in the field, empirical methods of document classification, and applications of data mining techniques (such as clustering and dimensionality reduction) for information management. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**INF 384M. Topics in Description and Metadata.**

Principles and practices for describing information resources. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**INF 384R. Digital Repositories.**

Introduction to issues in selecting, managing, and using digital repositories in diverse institutional settings. Covers repository models, collections, metadata, interoperability, preservation, policies, work flows, interfaces, visualization, applications, and services. Includes working with different repository software. Examines the impact of repositories on institutional culture, work practices, and publication models. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**INF 384W. Descriptive Cataloging and Metadata.**

Standards, rules, and metadata formats for representing information entities in library catalogs and other bibliographic systems. Emphasis on the Anglo-American Cataloguing Rules and the MARC metadata format. Web-based instruction; no class meetings. Information Studies 384E and 384W may not both be counted. Prerequisite: Graduate standing.

**INF 385C. Human-Computer Interaction.**

The history and importance of human-computer interaction (HCI), theories of HCI design, modeling of computer users and interfaces, empirical techniques for analyzing systems and interfaces, interface design, and styles of interaction. Emphasis on reviewing research papers, current works, and future directions in HCI research. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**INF 385E. Information Architecture and Design.**

The theory and design of information architecture: models that provide structure and context for information to shape meaning, purpose, and utility toward understanding. Students present theoretical reviews; map and design; and develop novel information architectures using a variety of methods and software applications. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**INF 385G. Advanced Usability.**

Designed to build upon the skills covered in Information Studies 385P. Individual project evaluating a Web site or other software user interface. Students devise a plan for testing, secure IRB approval to test human subjects, conduct study, analyze data, write a report, and present the results and conclusions. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Information Studies 385P.

**INF 385H. Digital Media Design.**

Design and production of graphic, audio, video, and multimedia materials, with emphasis on aesthetics and usability. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**INF 385K. Projects in Human-Computer Interaction.**

Projects based on theories of human-computer interaction design, modeling of computer users and interfaces, empirical techniques for analyzing systems and interfaces, interface design, and styles of interaction. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**INF 385L. Information Networks.**

History, design, and use of digital information networks. Emphasis on origins of the Internet in the United States, varied technical models for networked information services, and social analysis of networked communication from multiple disciplinary perspectives. Includes close review of classic papers in networked communication as well as current works. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**INF 385M. Database Management.**

Principles and practices of database management and database design. Discussion and implementation of a database. Application life cycle, data dictionaries, relational database design, SQL queries, reports and

other interfaces to database data, and documentation. Students work on individual and group projects. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 385N. Informatics.**

Investigation of informatics movements around the world and in various disciplines and professions, such as biomedicine, nursing, public health, education, business, law, and public affairs. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **INF 385P. Usability.**

The basics of user-centered design through the lifecycle of a software product. Includes perceptual, psychological, and other scientific underpinnings of usability and the justification for the application of usability engineering in software development. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 385Q. Knowledge Management Systems.**

Survey of knowledge management systems that enable the access and coordination of knowledge assets, including intranets, groupware, Weblogs, instant messaging, content management systems, and e-mail in both individual and organizational contexts. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 385R. Survey of Digitization.**

Introduction to the issues and trends in digitization initiatives and management, including project planning and management, asset delivery and management systems, interoperability and the importance of standards, copyright and other legal issues, metadata basics, digital preservation, and specific digitization processes for documents, images, video, and sound. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 385S. Digital Libraries.**

Research, development, and evaluation issues in digital libraries, including collection development and digitization; provision of access to multimedia materials; access strategies and interfaces; metadata and interoperability; and the implications of digital libraries with respect to policy and social issues. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 385T. Special Topics in Information Science.**

Study of the properties and behavior of information. Technology for information processing and management. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Presenting Information.** Visual, numerical, textual, and verbal presentation of information based on fundamental theories of human information perception and communication. Examples may include tables, graphs, dashboards, infographics, and reports. Information Studies 385T (Topic: Presenting Information) and 385T (Topic 1) may not both be counted.

**Topic 2: Visualization.** Concepts, principles, strategies, techniques, and tools for the visual presentation of large, high-density, or complex information resources from a variety of disciplines such as the sciences, humanities, law, arts, and business. Information Studies 385T (Topic: Visualization) and 385T (Topic 2) may not both be counted.

**Topic 3: Human Computation and Crowdsourcing.** Introduction to the theory, methods, and applications of human computation and crowdsourcing; covering a breadth of key concepts as well as more specialized depth in one or more key sub-areas. Information Studies

385T (Topic: Human Computation and Crowdsourcing) and 385T (Topic 3) may not both be counted.

**Topic 4: Mobile Interaction Design.** Introduction to the design of mobile interactions with emphasis on research and analysis, conceptual design, mobile interface prototyping, and the basics of interface evaluation and usability testing. Only one of the following may be counted: Information Studies 385T (Topic: Mobile Interaction Design), 385T (Topic 4), 385C.

### **INF 385U. Digital Media Collections.**

Collection design, resource selection, description and organization, development of user access mechanisms. May include collection considerations in regards to various media, workflow and project management, audience analysis, and notions of authorship in the collection context. Three lecture hours a week for one semester. Information Studies 385T (Topic: Creating and Using Digital Media Collections) and 385U may not both be counted. Prerequisite: Graduate standing.

### **INF 385V. Health Informatics.**

Introduction to health informatics; includes fundamentals of information in biomedicine, nursing, public health, bioinformatics and genomics, electronic records, and integrated systems. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 385W. Security Informatics.**

Explores information, computer, and network security in several contexts. Examines business impacts of security, societal implications of the protection of information resources, and technical aspects of securing information technology systems and data. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 386. History of Information and Society.**

Topics on the histories of information; libraries; archives; information science, technology, and businesses; conservation; and museums. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **INF 386C. Archives, Records, and Preservation in the Modern World.**

Progress of archival enterprise, records management, and preservation administration from the Renaissance to the present. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 386E. Information and Culture.**

Examines information as a cultural phenomenon; may include e-commerce, privacy and secrecy, censorship, information as a commodity, Internet culture, access to cultural heritage, and control of the cultural record. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **INF 386G. Gender, Technology, and Information.**

Definitions of and metaphors for technologies; in-depth analysis of feminism and science and technologies studies, masculinities and technologies, women's underrepresentation in technology, reproductive and sexual technologies, domestic technologies, design and architecture, book clubs and reading, and gender and (information) articulation work. Three lecture hours a week for one semester. Only one of the following may be counted: Graduate School 390J (Topic: Gender, Technology, and Information), Information Studies 386G, Women's and Gender Studies 393 (Topic: Gender, Technology, and Information). Prerequisite: Graduate standing.

### **INF 386H. Theory and Methods of Oral History.**

Theories of oral history; practical methods for producing, recording, annotating, and searching oral and video histories; archival issues related to documentation of oral histories; use of oral histories in various scholarly fields. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 387. Administration.**

Theory and practice in the design, behavior, evaluation, and administration of libraries and other information agencies and systems. Marketing of information organizations and resources. Administrative applications of technology. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **INF 387C. Managing Information Organizations.**

Management theory, concepts, processes, and practices as applied to information agencies and systems. Three lecture hours a week for one semester. Information Studies 387C and 387W may not both be counted. Prerequisite: Graduate standing.

### **INF 387E. Evaluating Information Programs.**

Use of evaluation in support of decision making, setting priorities, allocating scarce resources, and improving programs. Students study how to conceptualize, design, implement, and report on evaluation in the context of working with a local client. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 387M. Information Marketing.**

Examines the marketing of information agencies, systems, services, publications, and software and hardware products to consumers. Includes marketing research, planning, user studies, product development, communication, pricing and distribution for profit and nonprofit organizations. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 387T. Information Technology and Work.**

Examines the role information technology plays in modern work. Case studies of historical and modern examples of technology implementation and work transformation. Includes qualitative techniques, such as interviewing and observing, for data collection; data analysis; and presentation of data. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 388C. School Library Management.**

Philosophy, objectives, and management of the school library; emphasis on facilities, staff resources, administrative procedures, and programs and services. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 388D. Planning and Management of Programs for Children and Young Adults.**

Designing and planning effective services and programs for children and young adults: technologies, information need analysis, and trends. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 388E. Historical Museums: Context and Practice.**

The process of exhibit creation in historical museums, from planning through development to opening and maintenance, as a negotiation among stakeholders for influence on the story that is told. Students visit local historical museums and examine how presentations are influenced by the institutional position of the museum, including its history and resources; the concerns of museum employees; the influence of the audience and of those who are directly affected or represented by an exhibit; and the role of contractual professionals. Three lecture hours a

week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **INF 388K. Organizational Environments.**

Mission, goals, and objectives of specific information settings. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Public Libraries.** History, missions, values, governance, funding, services, user communities, architecture, leadership, and issues in public librarianship.

**Topic 2: Academic Libraries.** The relationship of academic library management to trends in postsecondary education, to the institution the library serves, and to the research community at large.

**Topic 3: Special Libraries.** Development and management of special libraries and information centers.

**Topic 5: Rare Book and Special Collections.** Administration of rare book and manuscript collections. Introduction to analytical bibliography.

**Topic 6: Law Libraries.** Overview of law librarianship, the discipline of law, and the culture of the legal environment, including the context in which law librarians, legal publishers, and other legal information professionals work.

### **INF 388L. Professional Experience and Project.**

Study of a practical problem, current phenomenon, or professional issue in an institutional setting. Conference course. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, concurrent enrollment in Information Studies 181E, and completion of at least thirty semester hours of coursework in the graduate program in information studies.

### **INF 388R. Practicum in School Libraries.**

Fieldwork in a school library under the supervision of qualified personnel. At least 125 hours of supervised fieldwork for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing; concurrent enrollment in Information Studies 181E, completion of at least thirty semester hours of coursework in the graduate program in information studies, and consent of either the Assistant Dean for Student Affairs or the Associate Dean in the School of Information.

### **INF 388T. Internship in Libraries and Other Information Agencies.**

At least 125 hours of supervised fieldwork for one semester. May not be counted toward any degree in the School of Information. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the student's adviser.

### **INF 389C. Archival and Records Enterprise.**

Theory and practice of archival administration and records management. Problems in acquiring, organizing, and providing for use of archives and office records; issues in deterioration and care of paper, books, photographic material, magnetic records, and other media through preservation programs for libraries and archives. Three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing.

### **INF 389E. Introduction to Records Management.**

Systems for controlling recorded information in an organizational setting. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 389G. Introduction to Electronic and Digital Records.**

Examines personal recordkeeping and information management to explore the creation, management, and preservation of digital information. Includes current developments in digital technology that

affect recordkeeping. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 389J. Appraisal and Selection of Records.**

Investigates the history, theory, and practice of selecting and appraising records information for permanent or quasi-permanent retention in an archival environment. Explores influences of other stakeholders on the selection and appraising process. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 389K. Life Cycle Metadata for Digital Objects.**

Constructing the "metadata continuum" in order to understand how metadata may function as an authenticating wrapper for an electronic record. Analysis of the elements of the continuum, including records surveys and inventories, creation metadata, active management metadata, records schedules, accession records, cataloging and description metadata, maintenance records, and usage records. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **INF 389M. Introduction to Issues in Records Information.**

Exploration of the fundamentals of records information and their role in society. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 389N. Seminar in Archival Enterprise.**

Theory and practice of archival administration and records management. Problems in acquiring, organizing, preserving, and providing for use of administrative and collected archives. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **INF 389R. Introduction to Archival Enterprise I.**

Introduction to the records aspect of archival enterprise, from acquisition to use, with emphasis on arrangement and description. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 389S. Introduction to Archival Enterprise II.**

Administrative and professional issues, including organizing the work of a repository, management issues, marketing, space, law, and ethics. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 390C. Copyright: Legal and Cultural Perspectives.**

Digital and other important communication technologies; how copyright in the United States developed and has evolved; and copyright seen from a number of disciplinary points of view, such as legal studies, cultural history, and public policy. Other subjects may include the cultural commons; natural rights arguments for copyright versus social bargain and statutory arguments; identifying and protecting the public interest in information; the law of copyright and cultural categories such as the author, the work, intellectual property, and creation; and important federal court cases. Three lecture hours a week for one semester. Information Studies 390C and 390N (Topic: Copyright: Legal and Cultural Perspectives) may not both be counted. Prerequisite: Graduate standing.

### **INF 390N. Information Policy.**

Critical examination of conflicts and trends in information policy in private organizations and in federal, state, and international public-sector organizations. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Federal Information Policy.** Exploration of major information-policy conflicts around topics such as privacy, surveillance, and freedom of information; in-depth analysis of the implications of digital technologies in the post-9/11 United States. Designed to help

students develop skill in policy analysis as a research method and familiarity with many kinds of sources of information about federal information policy.

**Topic 2: Seminar in Information Policy.** Analysis of issues and trends in information policy in various environments.

### **INF 390P. Topics in Privacy.**

Policy, value systems, and critical theory regarding privacy, studied from historical, sociological, feminist, or other perspectives. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **INF 391D. Doctoral Inquiry in Information Studies.**

Topics in the theoretical, methodological, and practical aspects of information studies. The equivalent of three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Admission to the doctoral program in information studies.

**Topic 6: Directed Readings.** Offered on the credit/no credit basis only.

**Topic 7: Directed Research.** Offered on the credit/no credit basis only.

#### **Topic 8: Introduction to Doctoral Research and Theory I.**

Foundations of inquiry in the humanities, social sciences, and natural sciences, and a review of theories and methods of inquiry in information studies in particular.

**Topic 9: Doctoral Research and Theory II.** Epistemological concepts and processes of theory generation and testing in information studies, with special attention to research methods and specific problems of interest to the student.

**Topic 10: Survey of Information Studies.** An overview of the major ideas, concepts, and theories of information studies.

**Topic 11: The Research Enterprise.** An overview of the nature and purposes of research, and common methods and methodologies in information studies.

**Topic 12: Disciplinary Foundations for Information Studies.** An overview of concepts, results, and perspectives from philosophical, social science, humanistic, design, and technological disciplines that provide important underpinnings for information studies.

### **INF 391E. Advanced Topics in Information Studies.**

The equivalent of three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, Information Studies 391D (Topic 10: Survey of Information Studies), and consent of instructor.

### **INF 391F. Advanced Topics in Research Methods, Methodologies, and Design.**

The equivalent of three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, Information Studies 391D (Topic 11), or consent of instructor.

### **INF 391G. Doctoral Writing Seminar.**

Intensive writing, critique, and rewriting to assist senior doctoral students with refining their research writing in preparation for qualifying papers, dissertation proposals, and formal publications. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **INF 392C. Preservation Administration and Services.**

Theory and practice of preservation administration and services. Problems in planning, organizing, and implementing preservation work in libraries, archives, and museums. Three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing.

### **INF 392D. Preservation Basics.**

Fundamental issues and problem solving in the preservation of cultural heritage collections in libraries and archives. Topics include the development and ethics of preservation and conservation, types and causes of deterioration, preventive care and stabilization, monitoring and controlling interior environments, reformatting, and performing preservation-needs assessments. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 392E. Materials in Libraries, Archives, and Museums.**

Underlying factors in the physical nature of materials; concepts of permanence, durability, and deterioration; challenges of both traditional and modern collections; emphasis on print and photographic collections. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 392F. Risk Assessment and Collections Management.**

Agents of deterioration, including physical forces, security, disaster, and environmental conditions; risk assessment, strategies to reduce risk, and personal safety. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 392G. Management of Preservation Programs.**

Management of specific preservation strategies for cultural record; preservation policy; the selection process for preservation; minor mending and repair operations; library binding and conservation treatment; preservation assessments; emergency preparedness; contracting for services; and budgeting, grant writing, and fund-raising for preservation. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 392H. Creating Sustainable Digital Collections.**

Hands-on activities that focus on building sustainable collections of digitized resources. Designed to help students gain curatorial understanding of the media to be digitized and knowledge of and experience with the technical and managerial aspects of the digitization process. Includes creation of metadata and digital preservation strategies for long-term access. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 392K. Digital Archiving and Preservation.**

Examines the permanent archiving of digital information. Covers media refreshment, emulation, migration, and electronic records repository construction and administration. Case study projects involving campus repositories and off-campus institutions. Students use legacy hardware and software and digital forensics tools to preprocess digital collections for repository storage. Also explores issues in long-term electronic records preservation. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **INF 392L. Introduction to Audio Preservation and Reformatting.**

Study of audio recording through a chronological examination of the development of recording; basic care and preservation of recordings; economics of audio preservation; and stability concerns of modern media. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 392M. Advanced Audio Preservation and Reformatting.**

Exploration of changing concepts in the nature of audio information in different formats, issues of access within the context of preservation, criteria for prioritization of materials to be reformatted, considerations in invasive versus minimal restoration, and study of rare formats. Three

lecture hours a week for one semester. Prerequisite: Graduate standing and credit or registration for Information Studies 392L.

### **INF 392P. The Politics of Preservation.**

Introduction to the components of the media industries, using the available literature as well as the University's film and video resources. The course employs both a theoretical and a practical approach to the archival media product. Debate over defining historical media material as artifact complements discussion of the realities of digitization and physical deterioration. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 393C. Conservation Laboratory Techniques.**

Analysis, housing, and treatment of physical objects. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; Information Studies 392E is strongly recommended.

**Topic 8: Conservation Science I.** Introduction to the physical and chemical properties of materials used in fabrication; and identification and repair of books, photographs, manuscripts, and related objects.

**Topic 9: Conservation Science II.** Advanced exploration of the physical and chemical properties of materials used in fabrication; and identification and repair of books, photographs, manuscripts, and related objects. Includes a research investigation of a typical conservation problem. Offered on the letter-grade basis only.

**Topic 10: Treatment Techniques for Flat Paper.** Basic techniques for care and handling of paper materials including but not limited to mending, dry cleaning, humidification and flattening, exhibit design and installation, enclosures, and documentation.

**Topic 11: Treatment Techniques for Bound Materials.** Basic techniques for care and handling of bound materials including but not limited to sewing structure, minor mends, and enclosures.

### **INF 397. Research in Information Studies.**

Methods and subjects of research in information studies. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### **Topic 1: Bibliography and Methods in Historical Research.**

Sources of information for, and techniques of conducting, investigations in history.

**Topic 2: Practicum in Research.** Offered on the credit/no credit basis only. Additional prerequisite: Consent of instructor and the graduate adviser.

**Topic 3: Digital Libraries Research.** Exploration of theoretical and practical research on creating digital collections and making them available. Additional prerequisite: Information Studies 385R and 392H, significant experience in digital applications in digital libraries, or consent of instructor.

**Topic 4: Seeking Funding for Information Studies.** Designed to help students gain an understanding of and hands-on experience with the pursuit of funding for information studies. Students investigate possible funding sources, and develop at least one grant or contract application.

### **INF 397C. Understanding Research.**

Survey of the goals, methods, processes, and products of systematic inquiry. Designed to prepare students to critically evaluate information studies research. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 397D. Bibliography and Methods in Historical Research.**

Sources of information for and techniques of conducting investigations in history. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **INF 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in information studies, Information Studies 397C, and written consent of the graduate adviser; for 698B, Information Studies 698A and concurrent enrollment in Information Studies 181E.

### **INF 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in information studies, Information Studies 397C, concurrent enrollment in Information Studies 181E, and written consent of the graduate adviser.

### **INF 398T. Supervised Teaching in Information Studies.**

History and present status of education for librarianship and information studies. Curriculum design, systematic course design and management, teaching methodologies, and evaluation of learning. Three lecture hours a week for one semester. May be repeated for credit as a teaching practicum. Prerequisite: Graduate standing and consent of instructor.

### **INF 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **INF 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Information Studies 399R, 699R, or 999R.

## **College of Liberal Arts**

## **African and African Diaspora Studies**

Master of Arts  
Doctor of Philosophy

### **For More Information**

**Campus address:** Black and Latino Studies Building (BLS), phone (512) 471-5180, campus mail code: E3400

**Mailing address:** The University of Texas at Austin, Graduate Program, African and African Diaspora Studies Department, Mailcode E3400, Austin, TX 78712

**Email:** aadsgradprogram@austin.utexas.edu

**URL:** <http://www.utexas.edu/cola/depts/aads>

### **Facilities for Graduate Work**

Graduate students in the African and African Diaspora Studies Department (AADS) have access to three highly-specialized units dedicated to rigorous scholarship in black studies. With more than thirty full-time or jointly-affiliated faculty members representing the interdisciplinary aspects of the program, AADS promotes activist academics and is dedicated to the study of the intellectual, political, artistic, and social experiences of people of African descent throughout Africa and the African diaspora, including the United States. The Institute for Urban Policy Research and Analysis (IUPRA) produces cutting-edge policy research and analysis related to urban issues. The institute's staff, academic fellows, and graduate students generate publications, reports, briefs, grants, and contracts with the aim of shaping policy to enhance the

lives of African Americans and other people of color in the state of Texas. The John L. Warfield Center for African and African American Studies (WCAAAS) offers research opportunities and programming across a broad variety of disciplines focused on black people in Texas, the United States, and the African diaspora, including Africa, the Americas, the Caribbean, and Europe.

Black studies graduate students have access to the University's extensive and world-renowned research library system, including the Perry-Castañeda Library with over 2.5 million volumes, the Human Rights Documentation Initiative, the Benson Latin American Collection, and the Harry Ransom Center. The black queer studies collection is meant to feature, promote, and increase the discoverability of the University of Texas at Austin Libraries' unique holdings in the area of black lesbian, gay, bisexual, transgender, and queer (LGBTQ) studies. It is a groundbreaking project in librarianship that addresses standard obstacles posed by the Library of Congress Subject Headings and information retrieval systems used to locate materials by and about black diasporic LGBTQ people. Students are also encouraged to utilize campus-wide arts facilities including the Fine Arts Library, the Texas Performing Arts Center, and the Blanton Museum of Art. The Warfield Center houses a gallery that acts as a living arts space designed to encourage, promote, and sustain Black artistic expression. Also featured in the Warfield Center is the recently-acquired African Art Collection, comprised of 827 artifacts from sub-Saharan Africa.

### **Areas of Study**

The AADS graduate program is designed to provide students with the skills and analytical frameworks necessary to engage interdisciplinary approaches for examining the lives of people of African descent throughout Africa and the African diaspora, including the United States. Students will explore key works within the subfields of black feminism, black history, black queer theory, critical race theory, critical educational studies, performance studies, political economy, and political philosophy. The program's objective is to provide students with the broad foundational knowledge necessary to pursue an academic career, or to conduct scholarly research in African and African diaspora studies (also known as *Africana*, black, African and African American, or African and/or black diaspora studies), or related fields.

### **African and African Diaspora Studies Doctoral Portfolio Program**

Doctoral students at University of Texas at Austin who are interested in African and African diaspora studies are invited to apply to the graduate portfolio program in African and African diaspora studies. The objectives of the program are to engage students in an advanced approach to interdisciplinary studies, a mapping of the intellectual breadth of African and African diaspora studies, and the continued development of existing resources in the area, including a sustained international and national reputation for intellectual rigor and productivity in black studies.

Students in the program sustain a rigorous dialogue about African and African diaspora studies from a productive intellectual and methodological standpoint; develop, deeply understand, and build the University's resources through the development of interdisciplinary methodology; become familiar with the diversity of faculty specialties within African and African diaspora studies; foster University of Texas at Austin's national and international reputation as a recognized leader in African and African diaspora studies; and are instructed in the application of the theoretical and conceptual tools of analysis and research on African-descended peoples.

Applicants to the portfolio program must submit a research statement along with her or his application. This statement will help the AADS



Portfolio Administrator guide the student in the completion of twelve hours of graduate-level coursework in the field of Black Studies. All portfolio students are required to present their field-related research to an open audience prior to graduation.

The certification requirements for the graduate portfolio program differ from the requirements for graduate degrees and should be undertaken only with the approval of the student's supervising adviser and the student's departmental graduate adviser. With the consent of a graduate student's home department, courses used to satisfy portfolio requirements may be included in the program of work for the doctoral degree. Applicants to the portfolio program must be in good standing in an approved doctoral program and must maintain a grade point average of 3.3 or better in order to continue in the portfolio program. Although students can enter the AADS Doctoral Portfolio Program at any point in their doctoral work, it is recommended that they complete the portfolio requirements before being admitted to candidacy.

Additional requirements and application information are available here (<http://www.utexas.edu/cola/depts/aads/graduate-programs/doctoral-portfolio-in-african-and-african-diaspora-studies.php>).

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Omoniyi Afolabi	Yasmiyn Irizarry Murphy
Charles O Anderson	Omi Osun Joni L Jones
Jossianna Arroyo Martinez	Xavier Livermon
Daina R Berry	Minkah Makalani
Simone A Browne	Stephen H Marshall
Tshepo Chery	Fehintola A Mosadomi
Kevin O Cokley	Matt T Richardson
King E Davis	Cherise Smith
Kevin M Foster	Christen Smith
Lyndon K Gill	Eric Tang
Edmund T Gordon	Lisa Thompson
Kali N Gross	Shirley E Thompson
Frank A Guridy	Natasha Tinsley
Charles R Hale	Joao H Vargas
Juliet A Hooker	

## Degree Requirements

### Master of Arts

Students must complete thirty-six semester hours of coursework, including a prescribed number of hours in core coursework, professional development, and supporting coursework. As part of the thirty-six hours, students must complete a two-part Master's Report that consists of African and African Diaspora Studies 397R and 398R. African and African Diaspora Studies 398R must be taken in the final semester of program enrollment. Core coursework explores the theoretical and methodological foundations of black studies. Additional information about the Program of Work is available from the department.

### Doctor of Philosophy

Coursework for the PhD varies based on a student's preparation in the field of black studies. This most often affects students who hold Master's degrees in this area; students who enter without Master's degrees in an approved field must complete the African and African Diaspora Studies (AADS) MA degree requirements before taking the PhD qualifying examinations. Each student's degree plan will be

determined by the AADS Graduate Studies Committee (GSC), the AADS graduate adviser, and the student's faculty adviser upon entry to the program. Students must complete a prescribed number of hours in core coursework, professional development, supporting coursework, and dissertation reading and writing, in addition to qualifying examinations. Core coursework explores the theoretical and methodological foundations of black studies.

Non-English proficiency is not required upon admission to the program, but doctoral students must demonstrate proficiency in a non-English language before they are allowed to advance to candidacy. The language and method of evaluation (which could include a translation examination evaluated by departmental faculty members, a speaking proficiency exam, or another method) should be determined by the student and her or his faculty adviser, and then must be approved by the GSC and the AADS graduate adviser. The fulfillment of the language requirement must reflect the student's research interests.

To be admitted to candidacy for the doctoral degree, all PhD candidates must pass qualifying examinations. Upon successful completion of the PhD coursework and qualifying examinations, students may file for doctoral candidacy and register for dissertation hours. The dissertation culminates in an original body of scholarly, independent research demonstrating the candidate's expertise in her or his selected area of concentration. In consultation with the faculty adviser (who serves as dissertation committee chair), the candidate selects a dissertation committee, including at least four other committee members. At least three members of the full dissertation committee must be members of the AADS GSC, and at least one member of the committee must be from an outside department or program. More information about the doctoral coursework requirements, foreign language requirement, qualifying examinations, and dissertation process is available from the department.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### African and African Diaspora Studies: AFR

#### AFR 380. Introduction to Policy Research.

Introduction to the tools needed to understand policy issues and analysis with respect to contemporary case examples. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

#### AFR 380C. Marginalized Communities and Policy Development.

An exploration of how different racial groups in the United States have been historically and are presently marginalized through larger political and social systems, and how these systems have allowed groups to attain and maintain power and privilege in the United States. Three lecture hours a week for one semester. Offered on the letter-grade basis only.

#### AFR 380D. Race, Ethnicity, and Gender Policies.

An exploration of the development of race, ethnicity, and gender theories and their application to social issues, policy development, and policy implementation. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

**AFR 380P. Topics in Race, Gender, and Policy.**

Explores policy-related issues related to race and gender in the African diaspora, from both qualitative and quantitative perspectives. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**AFR 381. Topics in Theorizing Diaspora.**

Topics focusing on the academic literature in the humanities, social sciences, and fine arts relating to various theories of the African diaspora. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**AFR 382. Race and the Urban Crisis.**

Examines the roots of the urban crisis, or the decline of U.S. and global cities in the post-World War II era, and begins with the premise that the story of the urban crisis is simultaneously the story of racial crisis. Explores how the origins of themes such as urban unrest, concentrated poverty, the housing crisis, the drug epidemic, and welfare dependency are rooted in race, class, and spatial inequities. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**AFR 385. Topics in Race and Political Economy.**

An exploration of the role of race in political processes, and the distribution of resources and power. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**AFR 387D. Topics in Black Expressive Culture.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**AFR 388. Topics in Black Feminisms and Black Queer Theory.**

Explores the methodological, conceptual, aesthetic, and political gains emerging from various strands of black feminist and black queer studies perspectives. Special attention is given to the advantages and limitations of key concepts within these bodies of work, including experience, standpoint theory, and intersectionality. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**AFR 390. Black Studies Theory I.**

An exploration of the innovative, complex, and distinctive African diaspora social structures and cultural traditions, as well as the historical, cultural, political, economic, and social development of people of African descent. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

**AFR 391. Black Studies Methods.**

A survey of seminal black studies texts and methods that have transformed the social sciences, humanities, and fine arts in producing a distinct black studies epistemology. Explores what black studies scholars have done to transform traditional methods and disciplines in pursuit of a distinct black studies methodology. Three lecture hours a week for one semester. African and African Diaspora Studies 381 (Topic: Black Studies: Theory and Methods) and 391 may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

**AFR 392. Black Studies Theory II.**

An in-depth exploration of the innovative, complex, and distinctively African diaspora social structures and cultural traditions, as well as the historical, cultural, political, economic, and social development of people of African descent. Three lecture hours a week for one semester. Offered

on the letter-grade basis only. Prerequisite: Graduate standing, and African and African Diaspora Studies 390.

**AFR 393. Topics in Anthropology of Education.**

Applies the tools of socio-cultural anthropology to the exploration of issues facing students of African descent in different learning settings. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**AFR 394. Topics in Race and Urban Life.**

An examination of the impact of urban space on racial processes, and how racialized processes affect the experiences associated with urban space, such as income and wealth dynamics, health, and educational experiences. Three lecture hours a week for one semester. African and African Diaspora Studies 387 and 394 may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**AFR 195P, 395P. Special Subjects in Professionalization in African and African Diaspora Studies.**

Advanced seminar designed to introduce students to African and African diaspora studies and the skills needed in this field; including writing and revision, competitive and successful applications for grants and fellowships, and development and preparation of a dissertation proposal. For each semester hour of credit earned, one lecture hour a week for one semester. May be repeated for credit. Prerequisite: Graduate standing, consent of instructor, and consent of the graduate adviser.

**AFR 395Q. Qualifying Examination Preparation.**

The equivalent of three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

**AFR 396. Conference Course in Black Studies.**

Individual instruction in specialized problems of advanced research in black studies. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor and the department.

**AFR 397R. Literature Review.**

Preparation of a report to be counted toward the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in African and African diaspora studies and consent of the supervising instructor and the graduate adviser.

**AFR 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in African and African diaspora studies; for 698B, African and African Diaspora Studies 698A.

**AFR 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in African and African diaspora studies, African and African Diaspora Studies 397R, and consent of the supervising instructor and the graduate adviser.

**AFR 398T. Supervised Teaching in African and African Diaspora Studies.**

Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### **AFR 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and written consent of the graduate adviser.

### **AFR 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: African and African Diaspora Studies 399R, 699R, or 999R, and written consent of the graduate adviser.

## **Yoruba: YOR**

### **YOR 382. Yoruba Language Studies.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing.

## **American Studies**

*Master of Arts  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Burdine Hall (BUR) 437, phone (512) 471-7277, fax (512) 471-3540; campus mail code: B7100

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of American Studies, 2505 University Avenue B7100, Austin TX 78712

**E-mail:** chad.crawford@austin.utexas.edu

**URL:** <http://www.utexas.edu/cola/depts/ams/>

### **Facilities for Graduate Work**

The University offers several unique resources for research on America. The Harry Ransom Center includes celebrated rare book and manuscript collections in American and modern literature; the Gernsheim Collection, one of the world's largest archives of photographs, negatives, and books related to the history of photography; the Performing Arts Collection, with material related to the theatre, movies, vaudeville, the circus, and the history of magic; and the New York Journal-American photographic archive. Recent major acquisitions include the papers of Norman Mailer, Woody Allen, David Foster Wallace, Woodward and Bernstein's records of the Watergate investigation, and the Magnum Archive Collection. The Nettie Lee Benson Latin American Collection is one of the world's great archives of materials about and from Latin America. The Dolph Briscoe Center for American History contains the early archives of Texas, the largest collection now extant of historical manuscripts dealing with Texas, an extensive collection of rare and scarce books, pamphlets, and broadsides related to Texas and Southwestern history, as well as major national collections related to journalists, political figures, and activists from the 1960s and 1970s. The holdings of the Blanton Museum of Art include the Mari and James A. Michener Collection of American Painting and the C. R. Smith Collection of Art of the American West. Winedale, an outdoor museum of restored nineteenth-century Texas buildings, is a center for research in historic preservation and material culture.

The University Libraries provide some of the best research facilities in the United States. Convenient to the University are other research facilities, including the Lyndon Baines Johnson Library and Museum, the Texas State Library and Archives, the United Daughters of the Confederacy Library, the Catholic Archives of Texas, the Archives of the Episcopal Church, and the Republic of Texas Museum.

## **Areas of Study**

The University has one of the oldest and most highly regarded programs in American studies, which focuses on the cultural, social, and intellectual life of the United States, as well as the place of the United States and US citizens in the world. Students in the department analyze the American past and present from the perspectives of several disciplines, learn to synthesize their knowledge, and acquire the habits of mind needed for cultural analysis.

The program offers courses in areas such as American intellectual, cultural, and artistic life; race, ethnicity, and gender; cultural geography and material culture; and the public arts and popular culture. Specific courses are offered on topics such as immigration, transnationalism, and diaspora; American political theory; property, race, and critical legal studies; religion and psychology; childhood studies; food and foodways; animals; technology and design; social movements and radical political cultures; feminism, fashion, and beauty; the experiences of Latin American and Caribbean descendants in the United States; space and place; and public memory. The program also invites students to take advantage of the resources of the John L. Warfield Center for African and African American Studies, the Center for Asian American Studies, the Center for Mexican American Studies, the Schusterman Center for Jewish Studies, the Center for Women's and Gender Studies, and the Américo Paredes Center for Cultural Studies. American studies courses are sometimes cross-listed with other courses throughout the University; in addition to the department's core faculty, students may work with faculty members from departments such as anthropology, art and art history, English, geography and the environment, government, history, radio-television-film, religious studies, and from the School of Architecture, School of Law, and College of Education.

The courses that American studies students take outside the program train them in areas of expertise relevant to their central interests. With the approval of the graduate adviser in American studies, these courses may be in any of the liberal arts or in architecture, business, communication, education, fine arts, law, the sciences, or public affairs.

### **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Robert H Abzug	Steven D Hoelscher
Ricardo C Ainslie	Jacqueline Jones
Phillip J Barrish	Martin W Kevorkian
Jason R Borge	Randolph R Lewis
Brian A Bremen	Stephen H Marshall
Simone A Browne	Jeffrey L Meikle
Erika M Bsumek	Julia L Mickenberg
Craig A Campbell	Deborah A Paredes
Evan B Carton	Maggie R Rodriguez
Sally H Clarke	Thomas G Schatz
Cary Cordova	Mark C Smith
James H Cox	Denise A Spellberg
Janet M Davis	Thomas F Staley
William E Forbath	Paul J Stekler
John M Gonzalez	Kathleen C Stewart
Don B Graham	William M Stott
Laurie B Green	Pauline T Strong
Nicole Marie Guidotti-Hernandez	Sharon L Strover
Barbara J Harlow	Eric Tang
John Hartigan	Shirley E Thompson
Linda D Henderson	Janice S Todd

# Degree Requirements

## Master of Arts

The student's program must total thirty-six semester hours of credit and must have the approval of the graduate adviser. Requirements are fifteen semester hours in American studies, consisting of six hours in the research course (American Studies 390), three hours in the required methodology course (American Studies 393), and six hours in cultural history (American Studies 385 and 386); the remaining required hours are nine semester hours in a field, or fields, outside of American studies; an additional nine semester hours of electives, primarily American in content, in another field, or fields, or within American studies. The program culminates in a master's report course (American Studies 398R) consisting of an article, after approval from the supervisor and second reader, submitted to a scholarly journal during the student's fourth semester. Typically, the article is based on a term paper or project from a course taken within the program.

## Doctor of Philosophy

To obtain the doctoral degree, a student must demonstrate reading competence in a foreign language, pass the American studies oral qualifying examination, prepare and defend a dissertation prospectus, which is intended to be an exploratory document and should be no longer than twenty pages, and write and defend a dissertation that is an original contribution to knowledge about American culture and that involves interdisciplinary research.

Students entering the PhD program, who did not complete their MA within the program, are required to complete six semester hours in cultural history (American Studies 385 and 386); three semester hours in the required methodology course (American Studies 393); three semester hours in the research course (American Studies 390); and six semester hours in electives (non conference courses), which may be within American studies or from outside departments. Additional hours may be required by the graduate adviser. The required coursework should be completed within the student's first year in the program.

While preparing for the oral examination, doctoral students will take independent reading courses (American Studies 392) under the direction of faculty members and with consultation from the graduate adviser. Through such coursework, the student will master three fields of specialization—American studies, a field of interest, and a dissertation field. These are the three fields of specialization on which the student is questioned in the oral qualifying exam. While preparing for the qualifying examination, students will be advised by the graduate adviser if additional coursework is needed. For students completing the Masters of Art degree in American studies at UT Austin, the qualifying examination should be taken during the spring semester of the student's third year in the program. Following the qualifying examination, the student is expected to convene a dissertation prospectus meeting during the fall semester of the fourth year in the program. For students entering the doctoral program with a qualifying master's degree from an outside program, the qualifying examination should be taken in the spring semester of the student's second year in the program. Following the qualifying examination, the student is expected to convene a dissertation prospectus meeting during the fall of the third year in the program.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also

reflect changes made to the course inventory after the publication of this catalog.

## American Studies: AMS

### AMS 385. Cultural History of the United States to 1865.

An interdisciplinary cultural history survey of the United States. Three lecture hours a week for one semester, with additional hours to be arranged. Prerequisite: Graduate standing and consent of the graduate adviser.

### AMS 386. Cultural History of the United States since 1865.

An interdisciplinary cultural history survey of the United States. Three lecture hours a week for one semester, with additional hours to be arranged. Prerequisite: Graduate standing and consent of the graduate adviser.

### AMS 390. Research Seminar in American Studies.

Research on selected topics in American studies. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### AMS 391. Reading or Research Seminar in American Studies.

Reading or research seminar on topics relevant to American studies. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### AMS 392. Conference Course in American Studies.

Individual directed readings and conferences on selected problems or topics in American studies. Conference course. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### AMS 393. Introductory Readings in American Studies.

Seminar designed to acquaint the graduate student with the nature and extent of materials for interdisciplinary research on American culture. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### AMS 394. Sources and Methods in American Studies.

Seminar designed to acquaint the graduate student with key sources and methodologies for interdisciplinary research on American culture. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### AMS 196, 396. Internship in American Studies.

Restricted to American studies majors. Practical working involvement with participating nonprofit and research agencies. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester; hours to be arranged. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### AMS 698. Thesis.

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in American studies and consent of the graduate adviser; for 698B, American Studies 698A.

### AMS 398R. Master's Report.

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in American studies and consent of the graduate adviser.

### AMS 398T. Supervised Teaching in American Studies.

Seminar in the methods of interdisciplinary teaching and professional work in American studies. Three lecture hours a week for one semester. Prerequisite: Graduate standing in American studies and consent of the graduate adviser.

### AMS 399R, 699R, 999R. Dissertation.

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### AMS 399W, 699W, 999W. Dissertation.

Offered on the credit/no credit basis only. Prerequisite: American Studies 399R, 699R, or 999R.

## Anthropology

*Master of Arts  
Doctor of Philosophy*

### For More Information

**Campus address:** Student Activity Center (SAC) 4.102, phone (512) 471-4206, fax (512) 471-6535; campus mail code: C3200

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Anthropology, 2201 Speedway C3200, Austin TX 78712

**URL:** <http://www.utexas.edu/cola/depts/anthropology/>

### Facilities for Graduate Work

Facilities available to graduate students in anthropology include the Dolph Briscoe Center for American History, the John L. Warfield Center for African and African American Studies, the Benson Latin American Collection, the Américo Paredes Center for Cultural Studies, and the Texas Archaeological Research Laboratory. The J. J. Pickle Research Campus and the Department of Anthropology offer facilities for research in antiquities conservation; geophysical survey; physical anthropology; paleontology; archaeomagnetic research; and primate anatomy and behavior. The department also maintains research facilities in archaeology, social anthropology, and linguistic anthropology.

### Areas of Study

Graduate study in anthropology is offered in the areas of biological anthropology, archaeology, linguistic anthropology, and sociocultural anthropology, with emphasis on North, Central, and South America, Micronesia, Central, South, and Southeast Asia, Madagascar, the Middle East, and Africa.

### Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Kamran Ali  
Cecilia Balli  
Deborah A Bolnick  
Karl W Butzer  
Craig A Campbell  
Ronald Covey  
James R Denbow  
Anthony F Di Fiore  
Nora C England  
Patience L Epps  
Veit F Erlmann  
Richard R Flores  
Kevin M Foster  
Maria Franklin  
Lyndon K Gill  
Edmund T Gordon  
Charles R Hale  
John Hartigan  
Heather Hindman  
John W Kappelman Jr  
Elizabeth L Keating  
Ward W Keeler  
Edward C Kirk  
Randolph R Lewis

Rebecca J Lewis  
Martha Menchaca  
Sofian Merabet  
Angela M Nonaka  
Robert M Oppenheim  
Denne N Reed  
Enrique R Rodriguez  
Arlene Rosen  
Liza J Shapiro  
Christen Smith  
Shannon Speed  
Kathleen C Stewart  
Pauline T Strong  
David S Stuart  
Circe D Sturm  
Kimberly M Tallbear  
John W Traphagan  
Fred Valdez Jr  
Joao H Vargas  
Kamala Visweswaran  
Maria D Wade  
Anthony K Webster  
Samuel M Wilson  
Anthony C Woodbury

## Degree Requirements

### Master of Arts

The degree program is offered in two options: with a thesis or with a report. The thesis option requires thirty semester hours of coursework; the report option requires thirty-three. Both options require students to complete the following: six semester hours of core coursework in anthropology; a minimum of twelve additional semester hours of coursework in anthropology; a minimum of six semester hours of coursework commonly taken as a minor outside the Department of Anthropology; and either a dedicated report or thesis course. Students in archaeology, linguistic anthropology, and biological anthropology must take at least one core course from their particular subfield. Students in sociocultural anthropology must complete the core course in social anthropology (Anthropology 392M, *Introduction to Graduate Social Anthropology*) as well as the core course in cultural forms (Anthropology 392P, *Introduction to Cultural Forms*). Recommended minor areas for supporting work include Asian studies, art history, biology, communication, comparative literature, computer science, economics, English, geography, geological sciences, government, history, kinesiology, Latin American studies, linguistics, philosophy, psychology, sociology, statistics, Middle Eastern studies, American studies, women's and gender studies, cultural studies, African and African diaspora studies, Mexican American and Latino/a studies, Native American and indigenous studies, and ethnomusicology.

### Doctor of Philosophy

A Master of Arts or an equivalent degree in anthropology or a closely related field is required for admission to the doctoral program. The student must complete a total of three of the following core courses: Anthropology 392K, *Introduction to Graduate Archaeology*, Anthropology 392J, *Introduction to Graduate Physical Anthropology: Behavior, Genetics, and Variation*, Anthropology 392L, *Introduction to Graduate Physical Anthropology: Primate Morphology and Evolution*, Anthropology 392M, *Introduction to Graduate Social Anthropology*, Anthropology 392N, *Introduction to Graduate Linguistic Anthropology*, Anthropology 392P, *Introduction to Cultural Forms*, Anthropology 392R, *African Diaspora Anthropology*, Anthropology 392S, *Introduction to Graduate Feminist*

*Anthropology, Anthropology 392T, Mesoamerica and Borderlands, and Anthropology 392Q, Introduction to Graduate Anthropology.*

Students in archaeology, linguistic anthropology, and biological anthropology are required to complete the core course(s) in their subfield. Students in the sociocultural anthropology subfield are required to include both Anthropology 392M, *Introduction to Graduate Social Anthropology* and Anthropology 392P, *Introduction to Cultural Forms* among their core courses and may also, at their supervisor's request, be required to complete the graduate portfolio in cultural studies. Additional information about the graduate portfolio in cultural studies is published by the Américo Paredes Center for Cultural Studies (<http://www.utexas.edu/cola/centers/culturalstudies>). Additionally all students must complete at least one core course from outside of their subfield.

Students with an extensive background in a subfield may petition the Graduate Studies Committee for exemption from the core courses in that area.

Finally, all PhD students, regardless of subfield, must also fulfill a foreign language requirement; information about this requirement is available from the graduate adviser. Before advancing to candidacy, a comprehensive examination is given in three areas of specialization. The topics are selected by the student in consultation with an examination committee. The student must also write and defend a detailed prospectus on his or her dissertation research. After completing the comprehensive examination(s), the student files an application for candidacy and researches, writes and defends the dissertation.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Anthropology: ANT

#### ANT 380J. Conference Course in Archaeology.

Individual instruction in specialized problems of advanced research in archaeology. Individual instruction. May be repeated for credit. Prerequisite: Graduate standing, and consent of instructor and the department prior to registering.

#### ANT 380K. Topics in Archaeological Method and Theory.

A major category of archaeological topics in which the emphasis is on anthropological theory pertinent to archaeological data and its interpretation. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 6: Ethnohistory and Archaeology.**

#### ANT 382N. Geo-Archaeology and Environmental History.

Same as Geography 382K. Long-term ecology as reconstructed from settlement and land-use histories. Empirical case studies in environmental history from the Mediterranean region, the Near East, and Mesoamerica. Applications to degradation, desertification, sustainability, and global change. Three lecture hours a week for one semester. Only one of the following may be counted: Anthropology 382N, Geography 356C, 382K. Prerequisite: Graduate standing.

#### ANT 383M. Topics in Archaeological Techniques and Procedures.

A major category of archaeological topics in which the emphasis is on techniques and procedures pertinent to the analysis of prehistoric data. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Conference Course.**

**Topic 2: Technological Analysis: Lithics.**

**Topic 4: Technological Analysis: Ceramics.**

**Topic 6: Field Projects.**

#### ANT 683N. Field Archaeology.

Two hundred forty hours of fieldwork. Prerequisite: Graduate standing and consent of instructor.

#### ANT 384M. Topics in Regional Archaeology.

Prehistoric cultural developments of a major geographical area; comparative cultural developments in ecologically similar areas. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Conference Course.**

#### ANT 386J. Conference Course in Social Anthropology.

Individual instruction in specialized problems of advanced research in social anthropology. Individual instruction. May be repeated for credit. Prerequisite: Graduate standing, and consent of instructor and the department prior to registering.

#### ANT 388. Topics in Physical Anthropology.

Constitutes one of two principal categories of courses in physical anthropology covering substantive studies in primate behavior, primate anatomy and evolution, human evolution, and growth and development. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 5: Primate Evolution.**

**Topic 7: Human Evolution.**

**Topic 8: Primate Anatomy.**

**Topic 9: Primate Behavior.**

**Topic 11: Hominid Paleocology.**

**Topic 13: Primate Ecology.** An introduction to the biology and ecology of living primates--prosimians, monkeys, apes, and humans.

#### ANT 388J. Conference Course in Physical Anthropology.

Individual instruction in specialized problems of advanced research in physical anthropology. Individual instruction. May be repeated for credit. Prerequisite: Graduate standing, and consent of instructor and the department prior to registering.

#### ANT 388K. Topics in General Anthropology.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 2: Anthropology of Education.** Same as Curriculum and Instruction 380G. A study of social life in contemporary American schools from an anthropological perspective. Prerequisite: Graduate standing, and twelve semester hours of upper-division coursework in education or consent of instructor.

**Topic 5: Ethnographic and Qualitative Research Methods.**

#### ANT 389. Topics in Unwritten Languages.

Intensive instruction in selected unwritten, usually aboriginal, languages. Three lecture hours and five laboratory hours a week for one semester.

May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

#### **ANT 389J. Conference Course in Unwritten Languages.**

Individual instruction in specialized problems in selected unwritten, usually aboriginal, languages. Individual instruction. May be repeated for credit. Prerequisite: Graduate standing, and consent of instructor and the department prior to registering.

#### **ANT 389K. Topics in Regional Ethnography.**

Anthropological surveys and analyses of societies and cultures of distinctive world areas. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

##### **Topic 1: Conference Course.**

##### **Topic 10: Indo-European Culture and Religion.**

##### **Topic 17: Mexican America.**

**Topic 19: Race and Ethnicity in American Society.** Same as Latin American Studies 391 (Topic 5: Race and Ethnicity in American Society).

**Topic 20: South Asia: History and Ethnography.** Issues in the history and ethnography of the Indian subcontinent. Topics may include class, caste, and ethnicity; communalism and secularism; colonialism and postcolonialism; the state and ethnic violence; anthropology, Indology, and history.

#### **ANT 391. Topics in Social Anthropology.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

##### **Topic 4: Cultural Construction of Masculinity.**

##### **Topic 7: Researching Women in Institutions.**

##### **Topic 15: History and Anthropology.**

##### **Topic 22: Representation and Signification.**

##### **Topic 27: Consciousness and Resistance.**

**Topic 32: Gender, Ethnicity, and Nationalism.** Same as Asian Studies 391 (Topic 4: Gender, Ethnicity, and Nationalism).

**Topic 34: Ethnographies of Global Asia.** Same as Asian Studies 391H. Methods and ethnographic study of transnational Asia and the Asian diaspora. Three lecture hours a week for one semester. Only one of the following may be counted: Anthropology 391 (Topic: Ethnography of Global Asia), 391 (Topic 34), Asian Studies 384 (Topic: Ethnography of Global Asia), 391H. Additional prerequisite: Graduate standing.

#### **ANT 391L. Topics in Research Methods in Physical Anthropology.**

In this second major category of courses in physical anthropology are listed those that have research techniques as their principal focus. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

##### **Topic 6: Analysis of Primate Anatomy.**

**Topic 8: Primate Sensory Ecology.** An integrated perspective on the comparative anatomy, physiology, and ecological significance of sensory adaptations in primates.

#### **ANT 392C. Core Topics in Anthropology.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### **ANT 392J. Introduction to Graduate Physical Anthropology: Behavior, Genetics, and Variation.**

Three lecture hours a week for one semester. Core course for physical anthropology students. Prerequisite: Graduate standing.

#### **ANT 392K. Introduction to Graduate Archaeology.**

Core course. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **ANT 392L. Introduction to Graduate Physical Anthropology: Primate Morphology and Evolution.**

Three lecture hours a week for one semester. Core course for physical anthropology students. Prerequisite: Graduate standing.

#### **ANT 392M. Introduction to Graduate Social Anthropology.**

Core course. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **ANT 392N. Introduction to Graduate Linguistic Anthropology.**

Same as Linguistics 396 (Topic 2: Introduction to Graduate Linguistic Anthropology). Core course. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### **ANT 392P. Introduction to Cultural Forms.**

Core course. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **ANT 392Q. Introduction to Graduate Anthropology.**

Core course. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **ANT 392R. African Diaspora Anthropology.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **ANT 392S. Introduction to Graduate Feminist Anthropology.**

Core course. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **ANT 392T. Mesoamerica and Borderlands.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **ANT 393. Topics in Linguistic Anthropology.**

Training and individual research in subjects concerning the relations between language and culture. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 3: Speech Play and Verbal Art.** Same as Linguistics 393 (Topic 6: Speech Play and Verbal Art). Additional prerequisite: Consent of instructor.

**Topic 7: Discourse Analysis.** Additional prerequisite: Consent of instructor.

**Topic 8: Ethnography of Speaking.** Same as Linguistics 396 (Topic 3: Ethnography of Speaking). Additional prerequisite: Consent of instructor.

**Topic 14: Language and Power.** Additional prerequisite: Consent of instructor.

#### **ANT 393J. Conference Course in Linguistic Anthropology.**

Individual instruction in specialized problems of advanced research in linguistic anthropology. Individual instruction. May be repeated for

credit. Prerequisite: Graduate standing, and consent of instructor and the department prior to registering.

### **ANT 394J. Conference Course in Cultural Forms.**

Individual instruction in specialized problems of advanced research in cultural forms. Individual instruction. May be repeated for credit. Prerequisite: Graduate standing, and consent of instructor and the department prior to registering.

### **ANT 394M. Topics in Folklore, Public Culture, and Cultural Studies.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 4: Anthropology of the Performing Arts.**

**Topic 13: Cultural Poetics.**

**Topic 19: Foundations of Ethnomusicology.**

**Topic 20: Field Methods in Ethnomusicology.**

**Topic 26: Marxism and Expressive Culture.**

**Topic 29: Object, Matter, and Desire.** Examines various questions regarding matter and meaning.

**Topic 30: Affect.** A survey of theories of affect, including those of Freud, Foucault, and Deleuze, feminist theory, phenomenology, globalization theory, and ethnography.

**Topic 31: Public Culture.** Introduction to the theory and ethnography of public culture.

**Topic 32: Deleuze.** The major works of Gilles Deleuze, including the study of the ontology of differences and flow, resonance, affect, vitality, lines of flight, and assemblage.

**Topic 33: Cultural Critique.** Various forms of cultural critique, including culture jamming, speed theory, experimental ethnographic writing, posthumanism, postpositivism, and the memoir.

**Topic 34: New Ethnographic Writing.** Reading and writing new forms of ethnography, including experimental writing, performative writing, new journalism, and the memoir.

**Topic 35: Indigenous Cultural Politics.** The worldwide significance of indigenous movements, identities, and cultural forms.

**Topic 36: Representational Practices.** Theories of representation and representational practices, including the representation of collective selves and others in colonial and ethnographic narratives, collections, and displays.

**Topic 37: Cultural Analysis: The Case of Class.** The development of class analysis in history, sociology, and anthropology, including innovative approaches to the reproduction and performance of class identities.

**Topic 38: Cultural Analysis: The Case of Race.** Current uses of cultural analysis across a range of disciplines, focusing on how race is accounted for in a variety of invocations of culture.

**Topic 39: Cities in Time and Space.** The difficulties associated with making cities intelligible in terms of their distinctive historical and cultural dynamics.

**Topic 40: Anthropology and Mass Media.** Anthropology and mass media both inside and outside the West. Includes television, film, and popular music.

**Topic 41: Anthropology of Science.** Anthropological perspective on the position of scientific disciplines within their broader social contexts and the transformations of social orders based on developments of scientific knowledge.

**Topic 42: Foucault and Cultural Studies.** Examination of Foucault's major works, including an assessment of his theoretical and methodological contributions to scholarly research and political activism.

**Topic 43: Black Queer Studies.**

**Topic 44: Advanced Topics in Black Feminisms.** Theory and practice of black and Third-World feminisms, including as political space, activist methodology, artistic inspiration, and scholarly choice.

**Topic 45: Contemporary Cuban Public Culture(s).** The major preoccupations and tensions of public culture in the state of Cuba and the nation of individual Cubans.

**Topic 46: Black Public Culture: Diasporic Texts and Contexts.** Survey of cultural expressions and political moments of African-descended people since the social, cultural, and political upheavals of the 1970s.

### **ANT 395K. Cultural Adaptation and Change.**

Same as Geography 395. A graduate-level introduction to cultural behavior, adaptation, evolution and transformation, with emphasis on demography, diffusion, migration, ethnicity, and institutions. Three lecture hours a week for one semester. Prerequisite: Graduate standing in anthropology, geography, or a related field, and consent of instructor.

### **ANT 397. Conference Course in Anthropology.**

Individual instruction for graduate students on specialized problems of advanced research. Conference course. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **ANT 397F. Doctoral Forum.**

Development of skills in writing, revision, and presentation of papers and grant proposals, and in job hunting. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **ANT 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in anthropology and consent of the graduate adviser; for 698B, Anthropology 698A.

### **ANT 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in anthropology and consent of the graduate adviser.

### **ANT 398T. Supervised Teaching in Anthropology.**

Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **ANT 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **ANT 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Anthropology 399R, 699R, or 999R.

## **Asian Studies**

*Master of Arts (in Asian Studies)*

*Master of Arts (in Asian Cultures and Languages)*

*Doctor of Philosophy (in Asian Cultures and Languages)*

## **For More Information**

**Campus address:** Will C. Hogg Building (WCH) 4.134, phone (512) 471-5811, fax (512) 471-4469; campus mail code: G9300



**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Asian Studies, 120 Inner Campus Drive G9300, Austin TX 78712

**URL:** <http://www.utexas.edu/cola/depts/asianstudies/>

## Facilities for Graduate Work

Asian materials are distributed throughout the University of Texas Libraries, including the Perry-Castañeda Library, the Fine Arts Library, the Benson Latin American Collection, the Lyndon Baines Johnson Library and Museum, and the Harry Ransom Center. Asian maps are located primarily in the Perry-Castañeda Library Map Collection and the Geology Library.

The Ransom Center houses one of the finest rare book and manuscript collections in North America. Among its archives are items from the personal library of Sir William Jones, founder of the Asiatic Society; correspondence and manuscripts of novelist Paul Scott, Anita Desai, and Raja Rao; papers of Samuel Selvon and Nancy Wilson Ross; rare photographs attributed to Deen Dayal; and photo albums once owned by the Earl of Mayo. Sanskrit manuscripts from Dr. Patrick Olivelle were also added after he completed work on the Manavadharmasastra. Within the manuscript and book collections acquired from Great Britain are numerous titles on the British Empire. Among the materials in the Lyndon Baines Johnson Library and Museum are oral histories and policy papers related to Kashmiri politics, the Food for Peace Program, international relations with the subcontinent, and an extensive collection on the Vietnam War. The Benson Latin American Collection contains over 4,000 volumes that cover immigration from Asia to the Caribbean and South America, and the associated cultural phenomena of the diasporic communities.

## Areas of Study

The Master of Arts with a major in Asian studies is an interdisciplinary degree with a regional concentration on East Asia (China, Japan, Korea), South Asia, or both. The degree is intended primarily for those preparing for careers in fields such as business, communication, government, information studies, law, the military, and teaching, or to prepare for further advanced study in another discipline or area studies program.

The Master of Arts and Doctor of Philosophy degrees with a major in Asian cultures and languages are intended for students whose career objective is college or university teaching. For these degrees, students concentrate in Chinese, Hindi, Japanese, Korean, Malayalam, Sanskrit, Tamil, Telugu, or Urdu.

There is considerable flexibility in meeting degree requirements. Each student, in consultation with the graduate adviser and faculty mentor, designs an individual program within the framework of the requirements given in Degree Requirements (p. 234).

Graduate courses are offered regularly in the histories, cultures, religions, languages, and literatures of Asia. The study of these languages and cultures may also be included in programs leading to master's or doctoral degrees in other disciplines.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Kamran Ali  
Zoltan D Barany  
Joel P Brereton  
Kirsten Cather  
Sung-Sheng Yvonne Chang  
Indrani Chatterjee  
Donald R Davis  
David J Eaton  
Toni L Falbo  
Oliver Freiberger  
Kate Gillespie  
Lalitha Gopalan  
Sumit Guha  
Ian F Hancock  
Geraldine Heng  
Heather Hindman  
Madeline Y Hsu  
Syed A Hyder  
John W Kappelman Jr  
Ward W Keeler  
Shanti Kumar  
Janice Leoshko  
Huaiyin Li

Beili Liu  
William R Louis  
Xiaobo Lu  
Patricia Maclachlan  
Madhavi Mallapragada  
Mark Metzler  
Gail Minault  
A Azfar Moin  
Paula Ruth Newberg  
Youjeong Oh  
Robert M Oppenheim  
Stephen H Phillips  
Sharmila Rudrappa  
Martha A Selby  
David M Sena  
Thomas K Seung  
Snehal A Shingavi  
Rupert Snell  
Nancy K Stalker  
Cynthia M Talbot  
John W Traphagan  
Chien-Hsin Tsai  
Kamala Visweswaran

## Admission Requirements

### Master of Arts with a Major in Asian Studies

This program is intended for students who wish to acquire deeper knowledge in Asian studies and related language skills in order to pursue a career in business, government, nongovernmental organizations, or the like, or to prepare for further study in another discipline or area studies program. Successful applicants hold a bachelor's degree, often in a related field, and have a strong interest in China, Japan, Korea, South Asia, or some combination of these. Since they will specialize in one of these geographic areas and study at least one language of that area to an advanced level, previous language training is highly recommended. Those who apply to the program without language training may complete first- and second-year college level language coursework after they are admitted, but these courses will not count toward the semester hours required for the master's degree.

### Master of Arts / Doctor of Philosophy with a Major in Asian Cultures and Languages

This program is intended for students who wish to obtain a doctorate in order to pursue an academic career in the study of China, Japan, Korea, or South Asia. They may apply to enter the program with a bachelor's degree in area studies or a related field. Most applicants will have knowledge of an Asian language before applying for admission. Students without this knowledge but whose applications are otherwise outstanding may also be accepted into the program. Students may complete first- and second-year college level language coursework after they are admitted, but these courses will not count toward the credit hours required for their master's and doctoral degrees. Successful applicants holding only a bachelor's degree will initially be enrolled in the master of arts program, with the expectation that after obtaining the master's degree they will continue their study in the doctoral phase of the program. Applicants who already hold a master's degree in a related field may be admitted directly to the doctoral phase of the program. Such applicants normally have an advanced level of proficiency in the language and graduate-level coursework in the area of their specialization.

## Degree Requirements

All graduate students in the Department of Asian Studies are required to complete an annual report detailing their progress in the program. Annual reports are reviewed by the Graduate Studies Committee each spring.

### Master of Arts with a Major in Asian Studies

Students are required to take three semester hours of coursework in Asian history, in addition to either an additional three hours in Asian history or three hours in social sciences relating to their regional area of study. Students are also expected to show proficiency in a language relevant to their interests as determined by their adviser and mentor, either by completing six semester hours of advanced language study with a grade of at least *B* in each course, or by passing a proficiency examination.

Students may choose either the report option or the thesis option to conclude their master's program. The report option consists of at least thirty semester hours of coursework, including the report course, which is a three-hour, one-semester project in which the student conducts research and writes a report on a given topic. The thesis option consists of at least thirty semester hours of coursework, including the thesis course, which is a six-hour, two-semester project in which the student does in-depth research on a given topic.

Students who choose the thesis option must take at least twelve hours of courses in their area of specialization, with no more than six hours in any one discipline (such as literature, religion, visual culture, etc.). Students who choose the report option must take at least fifteen semester hours of such electives, with no more than nine hours in any one discipline.

Up to nine hours of undergraduate upper-division coursework, including language coursework, may be counted toward the degree.

### Master of Arts / Doctor of Philosophy with a Major in Asian Cultures and Languages

This program requires a minimum of forty-eight semester hours of coursework and consists of two phases. The first phase (master of arts) requires thirty semester hours of coursework, including the report course. Students must take at least three courses in their area of specialization—for example, in Japanese culture, Indian religion, or Chinese literature. They must also take one graduate course that introduces them to research methods of the appropriate discipline—for example, in historiography, ethnography, or literary theory/criticism—and another course in history or in the social sciences relating to their regional area of study. Up to nine hours of upper-division undergraduate coursework may be counted toward the master's degree.

In December of the second year in the master's program, students will receive a formal review to determine if they may continue on to the doctoral program. To complete the master's degree phase, students are expected to show proficiency in a language offered by the Department of Asian Studies, either by completing six semester hours of advanced language study with a grade of at least *B* in each course or by passing a proficiency examination. To complete the master's degree program, students must submit, in the last semester of their coursework (normally the fourth semester), a report that shows their ability to conduct independent research. Successful completion of this report is required for admission to the PhD phase.

The PhD phase of the program requires at least eighteen semester hours of coursework beyond the master's degree, prior to the completion of dissertation courses. In total, MA/PhD students must complete at least

twenty-four semester hours in the major and minor areas of specialization and six semester hours in theory and methodology related to the major and/or minor area(s).

Students admitted directly to the PhD program must complete at least thirty semester hours of coursework in addition to the dissertation courses. Within their field of expertise (China, Japan, Korea, or South Asia), students must complete twenty-four semester hours in the major and minor areas of specialization, and six semester hours in theory and methodology related to the major and/or minor area(s). Areas of specialization must be approved by the graduate adviser and mentor.

All PhD students are expected to demonstrate fifth-year proficiency in one Asian language prior to defending the dissertation.

Competency in at least one modern foreign language that will be used in research is required. The research language may be a European language, such as French or German, or a modern Asian language. If the student chooses to study an Asian language as his or her research language, the language should be one that is pertinent to the student's professional development, such as Hindi for students whose primary language of study is Sanskrit. The choice of language(s) and the required level of proficiency are determined by the mentor and dissertation supervisor in consultation with the graduate adviser.

To be admitted to candidacy for the doctoral degree, the student must take comprehensive examinations in his or her area of specialization, pass a dissertation prospectus hearing, and demonstrate research-level proficiency in the language(s) of their field. Normally, students take their comprehensive examination, including an oral defense, in the third or fourth semester of the PhD phase.

After passing the comprehensive examination, the student, in consultation with the graduate adviser and graduate mentor, selects five faculty members to form a dissertation committee; the chair of the committee is the student's dissertation supervisor. After passing the dissertation prospectus hearing, the student may advance to doctoral candidacy.

Published guidelines regarding the comprehensive examination, dissertation prospectus hearing, admission to candidacy, and completion of the dissertation are available from the Department of Asian Studies.

### Dual Degree Programs

The Department of Asian Studies offers the following dual degree programs in cooperation with other divisions of the University. More information is available from the graduate adviser in each program.

Field(s) of Study	Degree(s)
Business administration	Master of Business Administration
Public affairs	Master of Global Policy Studies
Public affairs	Master of Public Affairs

### Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## Asian Studies: ANS

### ANS 180C, 380C. Conference Course in Asian Studies.

Supervised individual study of selected problems in Asian studies. For each semester hour of credit earned, one lecture hour a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and written consent of instructor on form obtained from the graduate coordinator.

### ANS 381. Topics in Chinese Culture and Society.

Study of various aspects and periods of Chinese culture and society. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 1: Advanced Readings in Chinese Politics.** Same as Government 390L (Topic 19: Advanced Readings in Chinese Politics). Additional prerequisite: Twenty-four semester hours of coursework in government or related fields, and consent of the graduate adviser.

### ANS 382K. Topics in Korean Culture and Society.

Studies of various aspects and periods of Korean culture and society. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

### ANS 383. Topics in Japanese Culture and Society.

Study of various aspects and periods of Japanese culture and society. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 4: Japanese Politics.** Same as Government 390L (Topic 20: Japanese Politics). Additional prerequisite: Twenty-four semester hours of coursework in government or related fields, and consent of the graduate adviser.

**Topic 5: Japanese Religion.** Additional prerequisite: Graduate standing.

### ANS 384. Topics in South Asian Culture and Society.

Study of various aspects and periods of South Asian culture and society. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 2: Communalism in Colonial India.** Same as History 382N (Topic 4: Communalism in Colonial India).

**Topic 3: Ethnicity, Religion, and Politics in South Asia.** Same as Government 390L (Topic 17: Ethnicity, Religion, and Politics in South Asia). Additional prerequisite: Twenty-four semester hours of coursework in government or related fields, and consent of the graduate adviser.

**Topic 5: Social and Religious Reform in Modern India.** Same as History 382N (Topic 1: Social and Religious Reform in Modern India). Only one of the following may be counted: Asian Studies (Topic 5), History 382N (Topic 1), Religious Studies 394T (Topic: Social and Religious Reform in Modern India).

**Topic 6: South Asian Diaspora.**

**Topic 7: Middle Indic Languages and Literature.** Survey of the Middle Indic languages of South Asia, the communities that used these languages, and the literature composed in them. Asian Studies 384 (Topic: Middle Indic Languages and Literature) and 384 (Topic 7) may not both be counted. Additional prerequisite: Basic reading comprehension of Sanskrit equivalent to one academic year's study of Sanskrit.

**Topic 8: The Body in Indian Medicine and Myth.** Examines issues of embodiment in South Asia in various life stages, including conception, infancy, childhood, adulthood, and death drawn from various historical periods, medical traditions, religious narratives, and sociological and anthropological studies. Only one of the following may be counted: Asian Studies 384 (Topic: Body in Indian Medicine and Myth), 384 (Topic 8), Religious Studies 394T (Topic: Body in Indian Medicine and Myth).

### ANS 384C. Core Studies in South Asia.

An introduction to research methods used in South Asian studies. Three lecture hours a week for one semester. Asian Studies 384 (Topic: Core Studies in South Asia) and 384C may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### ANS 384E. Asceticism.

Examines ascetic contexts of various religious traditions, definitions of asceticism, the relationship between ascetic beliefs and ascetic practices, and the benefits and risks of using a comparative approach to study asceticism. Three lecture hours a week for one semester. Asian Studies 384 (Topic: Asceticism) and 384E may not both be counted. Prerequisite: Graduate standing.

### ANS 384F. Folklore and Oral Performance in South Asia.

Three lecture hours a week for one semester. Asian Studies 384 (Topic: Folklore and Oral Performance in South Asia) and 384F may not both be counted. Prerequisite: Graduate standing.

### ANS 384G. Gender and the Body in South Asian Text and Practice.

An introduction to how gender is used as a category of analysis across the humanities and social science disciplines; and how the body is used as an object for analysis. Three lecture hours a week for one semester. Asian Studies 384 (Topic: Gender and the Body in South Asian Text and Practice) and 384G may not both be counted. Prerequisite: Graduate standing.

### ANS 384P. Theatre, Gender, and Performance in South Asia.

Three lecture hours a week for one semester. Asian Studies 384 (Topic: Theatre, Gender, and Performance in South Asia) and 384P may not both be counted. Prerequisite: Graduate standing.

### ANS 385. Topics in Chinese Language and Literature.

Study of various aspects and periods of Chinese language and literature. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 1: Chinese Film and Literature.**

**Topic 3: Modern Chinese Literature.**

### ANS 385D. Development of the Literary Field in Modern China.

Applies French theorist Pierre Bourdieu's work on cultural production to the study of the development of modern and contemporary literature in China and Taiwan. Three lecture hours a week for one semester. Asian Studies 385 (Topic: Development of the Literary Field in Modern China) and 385D may not both be counted. Prerequisite: Graduate standing.

### ANS 385H. High and Popular Culture in Modern Chinese Societies.

Explores the production and consumption of elitist (high) and popular cultures in modern Chinese societies. Three lecture hours a week for one semester. Asian Studies 385 (Topic: High and Popular Culture in Modern

Chinese Societies) and 385H may not both be counted. Prerequisite: Graduate standing.

### **ANS 385M. Modern and Postmodern Chinese Literary Culture.**

Examines the complex phenomena of modernism and postmodernism in literature and the arts in China, Taiwan, and Hong Kong. Three lecture hours a week for one semester. Asian Studies 385 (Topic: Modern and Postmodern Chinese Literary Culture) and 385M may not both be counted. Prerequisite: Graduate standing.

### **ANS 385S. Critical Scholarship on Modern Chinese Literature.**

Survey of English-language critical scholarship on modern Chinese literature. Three lecture hours a week for one semester. Asian Studies 385 (Topic: Critical Scholarship on Modern Chinese Literature) and 385S may not both be counted. Prerequisite: Graduate standing.

### **ANS 386. Topics in Japanese Language and Literature.**

Study of various aspects and periods of Japanese language and literature. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 2: Modern Japanese Literature.** Only one of the following may be counted: Asian Studies 361 (Topic 9: Modern Japanese Literature in Translation), 386 (Topic 2), Japanese 384 (Topic 3: Modern Japanese Literature).

### **ANS 387K. Topics in Korean Language and Literature.**

Studies in various aspects and periods of Korean language and literature. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

### **ANS 388. Topics in South Asian Language and Literature.**

Study of various aspects and periods of South Asian language and literature. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

### **ANS 388C. Critical Approaches to the Study of South Asian Texts.**

Introduction to analyzing South Asian literature through the exploration of Indian "classics" on connoisseurship, reader response, style, and suggestion, as well as modern and contemporary works on literary theory from the West. Three lecture hours a week for one semester. Asian Studies 388 (Topic: Critical Approaches to the Study of South Asian Texts) and 388C may not both be counted. Prerequisite: Graduate standing.

### **ANS 388M. Translating India.**

Introduction to literary translation from a wide range of Euro-American and South Asian stances and viewpoints, focusing on the political nature of the act and the art of translation in colonial and post-colonial contexts. Three lecture hours a week for one semester. Asian Studies 384 (Topic: Translating India) and 388M may not both be counted. Prerequisite: Graduate standing.

### **ANS 389C. Topics in Asian History.**

Studies in various historical periods of different Asian countries or regions. Topics may be comparative or single-area. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Japan Since 1945.** Three lecture hours a week for one semester. Asian Studies 383 (Topic 2: Japan Since 1945) and 389C (Topic 1) may not both be counted. Additional prerequisite: Graduate standing.

### **Topic 2: War and Defeat in Japanese History and Memory.**

Interdisciplinary exploration of the Japanese experience and memory of the Pacific War, including topics such as Hiroshima, comfort women, the US occupation, and contemporary controversies surrounding textbooks and the Yasukuni Shrine. Three lecture hours a week for one semester. Asian Studies 383W and 389C (Topic 2) may not both be counted. Additional prerequisite: Graduate standing.

### **ANS 190, 290, 390. Topics in Asian Studies.**

Study of various Asian studies-related topics that do not focus on any single geographic region. For each semester hour of credit earned, one lecture hour a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 2: Authoritarian Political Systems.** Asian Studies X90 (Topic 2) is same as Government 390L (Topic 7: Authoritarian Political Systems). Comparative study of authoritarian and totalitarian patterns of government, past and present, Western and non-Western; special emphasis on Communist and Fascist systems. Additional prerequisite: Twenty-four semester hours of coursework in government or related fields, and consent of the graduate adviser.

**Topic 6: Intellectual History of Indo-Iranian Islam.** Asian Studies X90 (Topic 6) is same as History 388K (Topic 2: Intellectual History of Indo-Iranian Islam) and Middle Eastern Studies 381 (Topic 37: Intellectual History of Indo-Iranian Islam).

**Topic 7: Feminist Theory.** Asian Studies 390 (Topic: Feminist Theory) and 390 (Topic 7) may not both be counted.

**Topic 8: Asian Modernities.** Theory and criticism in the study of Asia, with particular attention to the origins and rise of modern comparative literary and cultural studies. Asian Studies 384 (Topic: Asian Modernities) and 390 (Topic 8) may not both be counted.

### **ANS 390C. Core Readings in Modern East Asia.**

Various aspects of East Asian history, culture, and society. Designed for new graduate students in the Department of Asian Studies. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **ANS 390M. Aesthetic Modernism in East Asia.**

Examines modernist trends in literature and the arts since the early twentieth century in places such as China, Japan, Taiwan, South Korea, Hong Kong, and Vietnam. Three lecture hours a week for one semester. Asian Studies 390 (Topic: Aesthetic Modernism in East Asia) and 390M may not both be counted. Prerequisite: Graduate standing.

### **ANS 391. Asia and the World.**

Study of various subjects with Asian studies-related content. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 1: Comparative Ethnic Conflict.** Same as Government 390L (Topic 21: Comparative Ethnic Conflict). Additional prerequisite: Twenty-four semester hours of coursework in government or related fields, and consent of the graduate adviser.

**Topic 3: European Imperialism: British Empire.** Same as History 380L (Topic 1) and Middle Eastern Studies 385 (Topic 12). Study of the British empire in the Middle East, Asia and Africa. Only one of the following may be counted: Asian Studies 391 (Topic 3), History 380L (Topic 1), Middle Eastern Languages and Cultures 381 (Topic 12: European Imperialism: British Empire), 385 (Topic 12). Additional prerequisite: Graduate standing.

**Topic 4: Gender, Ethnicity, and Nationalism.** Same as Anthropology 391 (Topic 32: Gender, Ethnicity, and Nationalism).

**Topic 6: International Business Fellows Seminar.** Same as Latin American Studies 381 (Topic 8: International Business Fellows Seminar); Middle Eastern Studies 380; and Russian, East European, and Eurasian Studies 380. Multidisciplinary seminar for students in area studies, business administration, law, and public policy. The faculty includes both academics and business leaders. Only one of the following may be counted: Asian Studies 391 (Topic 6), International Business 395 (Topic: International Business Fellows Seminar), Latin American Studies 381 (Topic 8), Middle Eastern Studies 380, Public Affairs 388K (Topic: International Business Fellows Seminar), Russian, East European, and Eurasian Studies 380. Offered on the letter-grade basis only.

**Topic 7: Women in Islamic Societies.** Same as History 382N (Topic 2: Women in Islamic Societies) and Middle Eastern Studies 385 (Topic 7: Women in Islamic Societies). Only one of the following may be counted: Asian Studies 391 (Topic 7), History 382N (Topic 2), Middle Eastern Studies 385 (Topic 7).

#### **ANS 391H. Ethnographies of Global Asia.**

Same as Anthropology 391 (Topic 34). Methods and ethnographic study of transnational Asia and the Asian diaspora. Three lecture hours a week for one semester. Only one of the following may be counted: Anthropology 391 (Topic: Ethnography of Global Asia), 391 (Topic 34), Asian Studies 384 (Topic: Ethnography of Global Asia), 391H. Prerequisite: Graduate standing.

#### **ANS 392. Topics in the Social Science of Asia.**

Examination of topics relating to the anthropology, sociology, politics, or economics of one or more Asian countries. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

#### **ANS 394. Tools and Methods in Asian Research.**

Study of the major research tools and methods used in current Asian scholarship. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### **ANS 395. Proseminar: Core Readings and Methods in Asian Studies.**

Various theories and methods used in the field of Asian studies, including disciplinary history, controversies, and the diversity of approaches within the field. Designed for new graduate students in the Department of Asian Studies. Three lecture hours a week for one semester. Asian Studies 390 (Topic: Proseminar in Asian Studies) and 395 may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

#### **ANS 397C, 697C, 997C. Comprehensive Examination Preparation.**

Restricted to doctoral students in the Department of Asian Studies. Individual instruction. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and written consent of instructor on a form obtained from the graduate coordinator.

#### **ANS 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in Asian studies and consent of the graduate adviser; for 698B, Asian Studies 698A.

#### **ANS 398L. Pedagogy for Language Instruction.**

Individual instruction in language pedagogy. Individual instruction. Offered on the credit/no credit basis only. Prerequisite: Graduate

standing, appointment as a teaching assistant in a language course in the Department of Asian Studies, and consent of the graduate adviser.

#### **ANS 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in Asian studies and consent of the graduate adviser.

#### **ANS 398T. Supervised Teaching in Asian Studies.**

Teaching under the close supervision of a faculty member. Includes weekly group meetings with the instructor, individual consultation, and reports throughout the teaching period. Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, and written consent of instructor on a form obtained from the graduate coordinator.

#### **ANS 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

#### **ANS 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Asian Studies 399R, 699R, or 999R.

### **Bengali: BEN**

#### **BEN 381. Conference Course in Bengali Language and Culture.**

Supervised individual study in Bengali language or culture. The equivalent of 3 lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and written consent of instructor on form obtained from the graduate coordinator.

### **Chinese: CHI**

#### **CHI 381. Conference Course in Chinese Language and Culture.**

Supervised individual study in Chinese language or culture. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and written consent of instructor on form obtained from the graduate coordinator.

#### **CHI 384. Topics in Chinese Language and Culture.**

Study of various aspects and periods of Chinese language or culture. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 1: Chinese Film and Literature.** Chinese literature and film from the early twentieth century to the present within the sociohistorical context of modern China.

**Topic 3: Contemporary Chinese Literature.**

**Topic 5: Modern Chinese Literature.**

**Topic 7: Readings in Chinese Journals.**

### **Hindi: HIN**

#### **HIN 381. Conference Course in Hindi Language and Culture.**

Supervised individual study in Hindi language or culture. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and written consent of instructor on a form obtained from the graduate coordinator.

## **HIN 384. Topics in Hindi Language and Culture.**

Study of various aspects and periods of Hindi language and culture. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and six semester hours of upper-division coursework in Hindi or consent of instructor; additional prerequisites vary with the topic.

**Topic 1: Advanced Reading, Composition, and Conversation I.**

**Topic 2: Advanced Reading, Composition, and Conversation II.** Additional prerequisite: Hindi 384 (Topic 1).

**Topic 3: Readings in Hindi.**

**Topic 4: Contemporary Hindi Narratives.** Hindi 330 (Topic 1: Contemporary Hindi Narratives) and 384 (Topic 4) may not both be counted.

**Topic 5: Hindi Drama and Film.** Hindi 330 (Topic 2: Hindi Drama and Film) and 384 (Topic 5) may not both be counted.

**Topic 6: Hindi Literature in the Nationalist Era.** Hindi 330 (Topic 3: Hindi Literature in the Nationalist Era) and 384 (Topic 6) may not both be counted.

**Topic 7: Language and Identity at the Margins of Hindi Fiction.** Hindi 330 (Topic 4: Language and Identity at the Margins of Hindi Fiction) and 384 (Topic 7) may not both be counted.

**Topic 8: Style and Register in Hindi.** Practice and improve skills in reading, listening, writing, and speaking for everyday social situations and some formal situations. Relevant to students working toward the "Advanced" level on the American Council for the Teaching of Foreign Languages (ACTFL) proficiency scale, equivalent to level 2 on the Interagency Language Roundtable (ILR) scale. Three lecture hours a week for one semester. Hindi 384 (Topic: Style and Register in Hindi) and 384 (Topic 8) may not both be counted. Additional prerequisite: Graduate standing, and reading and writing comprehension of Hindi equivalent to two academic years' study of Hindi, or consent of instructor.

## **Japanese: JPN**

### **JPN 381. Conference Course in Japanese Language and Culture.**

Supervised individual study in Japanese language or culture. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and written consent of instructor on a form obtained from the graduate coordinator.

### **JPN 384. Topics in Japanese Language and Culture.**

Study of various aspects and periods of Japanese language and culture. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and six semester hours of upper-division coursework in Japanese with a grade of at least C or consent of instructor; additional prerequisites vary with the topic.

**Topic 3: Modern Japanese Literature.** Only one of the following may be counted: Asian Studies 361 (Topic 9: Modern Japanese Literature in Translation), 386 (Topic 2: Modern Japanese Literature), 384 (Topic 3).

## **Korean: KOR**

### **KOR 381. Conference Course in Korean Language and Culture.**

Supervised individual study in Korean language or culture. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing, six semester hours of upper-division coursework in Korean, and written consent of instructor on a form obtained from the graduate coordinator.

## **KOR 384. Topics in Korean Language and Culture.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and six semester hours of upper-division coursework in Korean or consent of instructor; additional prerequisites vary with the topic.

## **Malayalam: MAL**

### **MAL 381. Conference Course in Malayalam Language and Culture.**

Supervised individual study in Malayalam language or culture. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and written consent of instructor on a form obtained from the graduate coordinator.

### **MAL 384. Topics in Malayalam Language and Culture.**

Study of various aspects and periods of Malayalam language and culture. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and six semester hours of upper-division coursework in Malayalam or consent of instructor.

## **Sanskrit: SAN**

### **SAN 381. Conference Course in Sanskrit Language and Culture.**

Supervised individual study in Sanskrit language or culture. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and written consent of instructor on form obtained from the graduate coordinator.

### **SAN 384S. Topics in Sanskrit Language and Culture.**

Study of various aspects and periods of Sanskrit language and culture. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; and Sanskrit 325L, 330, or the equivalent, or consent of instructor.

**Topic 1: Advanced Readings in Sanskrit.**

**Topic 2: Readings in Classical Sanskrit Prose and Literature.**

**Topic 3: Sanskrit Drama.** Provides students with a firmer foundation in Sanskrit grammar, syntax, and vocabulary; and an appreciation of the aesthetics of Sanskrit drama. Sanskrit 384S (Topic: Sanskrit Drama) and 384S (Topic 3) may not both be counted.

**Topic 4: Vedic Poetry.** Religious and literary features of Vedic poetry, the development of Vedic Sanskrit, and the relation of Vedic to Classical Sanskrit. Sanskrit 384S (Topic: Vedic Poetry) and 384 (Topic 4) may not both be counted.

## **Tamil: TAM**

### **TAM 381. Conference Course in Tamil Language and Culture.**

Supervised individual study in Tamil language or culture. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and written consent of instructor on form obtained from the graduate coordinator.

### **TAM 384. Topics in Tamil Language and Culture.**

Study of various aspects and periods of Tamil language and culture. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and Tamil 312L with a grade of at least C.

## Telugu: TEL

### TEL 381. Conference Course in Telugu Language and Literature.

Supervised individual study in Telugu language or literature. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and written consent of instructor on forms obtained from the graduate coordinator.

### TEL 384. Topics in Telugu Language and Culture.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and Telugu 312L with a grade of at least C.

## Urdu: URD

### URD 381. Conference Course in Urdu Language and Culture.

Supervised individual study. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and written consent of instructor on form obtained from the graduate coordinator.

### URD 384. Topics in Urdu Language and Culture.

Study of various aspects and periods of Urdu language and culture. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and six semester hours of upper-division coursework in Urdu with a grade of at least C; additional prerequisites vary with the topic.

**Topic 1: Advanced Reading, Composition, and Conversation I.**

**Topic 2: Advanced Reading, Composition, and Conversation II.**

**Topic 3: Readings in Urdu.**

**Topic 4: Female Voices in Urdu Literature.** Survey of prose and poetry written in Urdu by women during the last three centuries. Only one of the following may be counted: Religious Studies 341 (Topic: Female Voices in Urdu Literature), Urdu 330 (Topic 1: Female Voices in Urdu Literature), 384 (Topic 4).

**Topic 5: Love and Devotion in Urdu Literature.** Examination of various literary genres that are shaped by discourses on the love of God and devotion to the prophet Muhammad. Urdu 330 (Topic 2: Love and Devotion in Urdu Literature) and 384 (Topic 5) may not both be counted.

**Topic 6: Philosophy and Poetry of Iqbal.** Explores the prose and poetry written by the most influential twentieth-century Muslim reformer in South Asia, Muhammad Iqbal. Urdu 330 (Topic 3: Philosophy and Poetry of Iqbal) and 384 (Topic 6) may not both be counted.

**Topic 7: Urdu Aesthetics.** Intensive overview of the most popular lyrical genre of Urdu poetry, the ghazal, and the standards used to judge a good ghazal. Urdu 330 (Topic 4: Urdu Aesthetics) and 384 (Topic 7) may not both be counted.

**Topic 8: Style and Register in Urdu.** Practice of skills in reading, listening, writing, and speaking for everyday social situations and some formal situations. Relevant to students working toward the "Advanced" level on the American Council for the Teaching of Foreign Languages (ACTFL) proficiency scale, equivalent to level 2 on the Interagency Language Roundtable (ILR) scale. Urdu 384 (Topic: Style and Register in Urdu) and 384 (Topic 8) may not both be counted. Additional prerequisite: Reading and writing comprehension of Urdu equivalent to two academic years' study of Urdu, or consent of instructor.

**Topic 9: Urdu Short Stories: Manto.** Survey of the writings of Sadat Hasan Manto. Primary texts in Urdu, secondary materials in English. Urdu 384 (Topic: Short Stories: Manto) and 384 (Topic 9) may not both be counted.

**Topic 10: Qawwali Aesthetics.** Examination of the devotional currency of Qawwali, and issues of gender, class, religious differences, and nationalism. Explores the relationship between oral and written

literature and tensions between local aesthetics and the process of globalization. Urdu 384 (Topic: Qawwali Aesthetics) and 384 (Topic 10) may not both be counted.

## Classics

*Master of Arts  
Doctor of Philosophy*

### For More Information

**Campus address:** Waggener Hall (WAG) 123, phone (512) 471-5742, fax (512) 471-4111; campus mail code: C3400

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Classics, 2210 Speedway C3400, Austin TX 78712

**E-mail:** classics@mail.utexas.edu

**URL:** <http://www.utexas.edu/cola/depts/classics/>

### Facilities for Graduate Work

The Classics Library, located within the department in Waggener Hall and managed by its own staff, houses more than thirty thousand volumes spanning all areas of classical studies. Supporting collections and staff members are located in the Perry-Castañeda Library, the Architecture and Planning Library, the Fine Arts Library, and other University Libraries units. Holdings of the Harry Ransom Center include a collection of Greek papyri from Egypt and numerous Renaissance editions of classical texts. The Battle Collection of Plaster Casts and a collection of ancient pottery are housed in the Blanton Museum of Art. Graduate students also have access to the Swenson Coin Collection; the Meritt and Reinmuth squeeze collections; a collection of drawings, photographs, and notes on ancient architecture by Lucy Shoe Meritt; and a substantial study collection of material objects from around the ancient Mediterranean, including Egypt and the Near East. Additional resources within the department include a comprehensive photographic archive of prehistoric Aegean and Cypriot inscriptions and related research materials maintained by the Program in Aegean Scripts and Prehistory; visual media that include more than fifteen thousand digital images and more than seventy thousand slides; a well-equipped computer laboratory linked to major classical databases; and a full-time instructional technology and media staff.

Through the Institute of Classical Archaeology, the department sponsors archaeological fieldwork at Metaponto in southern Italy and at Chersonesus on the Black Sea. The Institute for the Study of Antiquity and Christian Origins conducts fieldwork at Ostia in Italy.

### Areas of Study

Classics is an interdisciplinary field embracing all areas of classical antiquity: language, history, literature, material culture, philosophy, religion, and so on. Within this broad area, the only limitation on programs of study is the availability of specialists to direct a student's work. The department offers a special concentration in classical archaeology, and the Departments of Classics and Philosophy offer a cooperative doctoral program in ancient philosophy. The faculty also maintains close links with the Departments of Art and Art History, English, French and Italian, History, and Religious Studies, and with the comparative literature program. A cooperative arrangement with the Institute of Nautical Archaeology at Texas A&M University makes courses in nautical archaeology and ancient seafaring available for UT Austin credit.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Deborah Beck	William R Nethercut
Joseph C Carter	Thomas G Palaima
Cristina Carusi	Paula J Perlman
Lesley A Dean-Jones	Adam T Rabinowitz
Jennifer V Ebbeler	Andrew M Riggsby
Steven J Friesen	Rabun M Taylor
Karl Galinsky	L M White
Robert J Hankinson	Stephen A White
Thomas K Hubbard	Paul B Woodruff
Ayelet H Lushkov	

## Degree Requirements

### Master of Arts

Course requirements are thirty-three semester hours of coursework, including the report course, which is a one-semester course of supervised research. No more than nine hours of upper-division coursework may be included in the program. The program of coursework is planned individually by the student in consultation with the graduate adviser. At least eighteen semester hours must be in Greek, Latin, or both. At least six semester hours of supporting work is required, either in classics or in related fields such as anthropology, art history, comparative literature, geography, history, linguistics, and philosophy. The master's degree student has no formal qualifying examinations before beginning the report.

### Doctor of Philosophy

Admission to the doctoral program is subject to the approval of the Graduate Studies Committee and normally requires a Master of Arts degree with a major in classics or a closely related field. The department awards the PhD in classics, and all students must demonstrate competence in both Greek and Latin. Students with a special interest in classical archaeology or ancient philosophy may pursue a concentration in either area.

**Course requirements.** There are no universal course requirements. A broad and changing menu of seminars provides training in many areas of study and methods of research. Students who concentrate in classical archaeology or ancient philosophy have special course requirements, which are described on the department's Web site (<http://www.utexas.edu/cola/depts/classics>).

**Examination requirements.** To be admitted to candidacy for the doctoral degree, students must pass the following written examinations: translation in Greek; translation in Latin; Greek history; Roman history; Greek literature (followed by an oral examination); Latin literature (followed by an oral examination); translation in German; and translation in a second modern language. A timetable with the recommended schedule for completion of the PhD requirements is available on the department's Web site (<http://www.utexas.edu/cola/depts/classics>).

Students who concentrate in ancient philosophy must pass the same written and oral examinations as above; however, instead of the Greek history or Roman history examination, students must pass an examination in ancient philosophy.

Students who concentrate in classical archaeology must pass the following written examinations: translation in Greek or in Latin; Greek archaeology; Roman archaeology; Greek history; Roman history; translation in German; and translation in a second modern language.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Classical Civilization: C C

#### C C 380. Seminar in Classical Archaeology.

Topics given in recent years include methods and theory, Greek and Roman Naples, landscape archaeology, and Hellenistic and Roman Egypt. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### C C 380J. Proseminar in Classical Literature.

Brief survey of the history of classical literature; orientation to the major periods and genres. Three hours a week for one semester. Designed for first-year graduate students. Prerequisite: Graduate standing.

#### C C 381. Conference Course in Classical Civilization.

Studies in classical antiquity. A knowledge of the ancient languages is not required. Three hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

#### C C 382. Field Archaeology.

Involves the participation of the student in an archaeological excavation; the study of field techniques includes excavation procedure, documentation, conservation, and interpretation. Three hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

#### C C 383. Studies in Classical Civilization.

Studies in various aspects of Greek and Roman literature, history, and culture. Three hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

##### Topic 1: Roman Imperial Funerary Monuments.

**Topic 2: Introduction to Diachronic Linguistics: Germanic.** Same as German 381 (Topic 3) and Linguistics 383 (Topic 8). Only one of the following may be counted: Anthropology 393 (Topic 16), Classical Civilizations 383 (Topic 2), German 381 (Topic 3), Linguistics 383 (Topic 8).

#### C C 383K. Current Concepts and Research in Classics.

Overview of important theories, issues, and research in classics. Three hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing.

#### C C 186K, 386K. Conference Course in Classical Literature.

Conference course. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### Greek: GK

#### GK 380J. Proseminar in Classical Literature.

Brief survey of the history of classical literature; orientation to the major periods and genres. Three hours a week for one semester. Designed for first-year graduate students. Prerequisite: Graduate standing.



### **GK 180K. Proseminar.**

An introduction to the research methodology and the ancillary disciplines used in current classical studies, or to certain disciplines such as meter, textual criticism. One hour a week for one semester. Topics other than those listed below may also be taught. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

**Topic 1: Research Methods in Classical Studies.** Offered on the credit/no credit basis only.

### **GK 383. Studies in Classical Greek Literature.**

Topics given in recent years include Greek oratory, Aristophanes, and Homer. Three lecture hours a week for one semester. Topics other than those listed below may also be taught. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Aeschylus.**  
**Topic 2: Sophocles.**  
**Topic 3: Thucydides.**  
**Topic 4: Aristophanes.**

### **GK 383K. Current Concepts and Research in Greek.**

An overview of important theories, issues, and research in classics. Three hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing.

### **GK 385. Graduate Reading Course.**

Topics given in recent years include Plato and Greek prose, Sophocles, and Sophists. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **GK 385W. Graduate Reading Course: Biblical Greek.**

Graduate level translation and analysis of topics such as the Pauline epistles or the Gospel of John. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **GK 186K, 386K. Conference Course in Greek Literature.**

Conference course. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **GK 386L. Conference Course in Greek Language.**

Restricted to students pursuing degrees other than in classics. Conference course. May be repeated for credit. Prerequisite: Graduate standing.

### **GK 390. Seminar in Classical Studies.**

Selected topics in Greek studies. Topics given in recent years include Mycenaean documents, Aristotle's ethics, Archaic poetry, and Plato's Symposium. The equivalent of three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **GK 398R. Master's Report.**

Preparation of a research report to fulfill the requirement for the master's degree. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in Greek and consent of the graduate adviser.

### **GK 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **GK 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Greek 399R, 699R, or 999R.

## **Latin: LAT**

### **LAT 380J. Proseminar in Classical Literature.**

Brief survey of the history of classical literature; orientation to the major periods and genres. Three hours a week for one semester. Designed for first-year graduate students. Prerequisite: Graduate standing.

### **LAT 180K. Proseminar.**

An introduction to the research methodology and the ancillary disciplines used in current classical studies, or to certain disciplines such as meter, textual criticism. One hour a week for one semester. Topics other than those listed below may also be taught. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

**Topic 1: Research Methods in Classical Studies.** Offered on the credit/no credit basis only.

### **LAT 383. Graduate Reading.**

Topics given in recent years include Latin prose, Seneca, and Augustine's Confessions. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **LAT 383K. Current Concepts and Research in Latin.**

An overview of important theories, issues, and research in classics. Three hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing.

### **LAT 385. Studies in Classical Latin Literature.**

Three hours a week for one semester. Topics other than those listed below may also be taught. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Caesar.**  
**Topic 2: Lucretius.**  
**Topic 3: Ovid's Metamorphoses.**  
**Topic 4: Tacitus.**  
**Topic 5: Vergil's Aeneid, Books VII-XII.**  
**Topic 6: Catullus.** Latin 385 (Topic 6) and 385 (Topic: The World of Catullus) may not both be counted.  
**Topic 7: Vergil's Eclogues.**

### **LAT 186, 386. Conference Course in Latin Literature.**

Conference course. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **LAT 386L. Conference Course in Latin Language.**

Restricted to students pursuing degrees other than in classics. Directed reading. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **LAT 390. Seminar in Classical Studies.**

Selected topics in Roman studies. Topics given in recent years include Roman comedy, Pliny, and Roman fragmentary historians. The equivalent of three lecture hours a week for one semester. Topics other than those listed below may also be taught. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **LAT 398R. Master's Report.**

Preparation of a research report to fulfill the requirement for the master's degree. The equivalent of three lecture hours a week for one semester.

Offered on the credit/no credit basis only. Prerequisite: Graduate standing in Latin and consent of the graduate adviser.

### **LAT 398T. Supervised Teaching in Latin.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **LAT 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **LAT 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Latin 399R, 699R, or 999R.

## **Cognitive Science**

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### **Cognitive Science: CGS**

#### **CGS 380. Advanced Topics in Cognitive Science.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Introduction to Cognitive Science.** Same as Linguistics 392 (Topic 1: Introduction to Cognitive Science), Philosophy 383C, and Psychology 394U (Topic 3: Introduction to Cognitive Science). Only one of the following may be counted: Cognitive Science 380 (Topic 1), Linguistics 392 (Topic 1), 393 (Topic: Introduction to Cognitive Science), 393 (Topic: Topics in Cognitive Science), Philosophy 383 (Topic: Introduction to Cognitive Science), 383C, Psychology 394U (Topic 3).

## **Comparative Literature**

*Master of Arts  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Calhoun Hall (CAL) 217, phone (512) 471-1925; campus mail code: B5003

**Mailing address:** The University of Texas at Austin, Graduate Program in Comparative Literature, 208 West 21st Street B5003, Austin TX 78712

**E-mail:** [complit@austin.utexas.edu](mailto:complit@austin.utexas.edu)

**URL:** <http://www.utexas.edu/cola/progs/complit/>

### **Facilities for Graduate Work**

Comparative literature offers a core of courses in the discipline and draws on the teaching and scholarly resources of faculty members in more than twenty programs in language, literature, and area studies. In addition to the University Libraries facilities, special collections in the Harry Ransom Center and the Benson Latin American Collection, for example, offer opportunities for research.

## **Areas of Study**

Students seeking the Master of Arts degree are expected to develop a broad knowledge of the theory and practice of comparative literature, both through coursework and through the completion of a report or thesis. In addition, they expand their acquaintance with a single national literature by studying it at the graduate level.

Students seeking the doctoral degree are expected to develop extensive knowledge of one national literature and broad knowledge of a second. They are required to complete, in effect, the equivalent of a master's degree in one national literature, while demonstrating proficiency in either two additional foreign languages or in one additional foreign language and a third area of relevant study. The program also prepares students in literary theory and criticism and in the scholarly and critical methods of studying the relationships among various literatures. Interdisciplinary study is also encouraged, as students explore the interrelationships between literature and other fields (such as art history, anthropology, film, philosophy, and psychology) as part of their programs of work. After fulfilling all requirements in the areas of literature, theory, and language and passing both qualifying and comprehensive examinations, students choose a period, genre, or historical, cultural, intellectual, or critical problem on which to write a dissertation.

Work toward the Master of Arts and Doctor of Philosophy is offered in collaboration with the Departments of Asian Studies, Classics, English, French and Italian, Germanic Studies, Middle Eastern Studies, Slavic and Eurasian Studies, and Spanish and Portuguese. Courses in support of the student's area of specialization are offered in various units, including the many interdisciplinary area studies centers within the College of Liberal Arts; the Departments of Anthropology, Art and Art History, History, Linguistics, and Philosophy; the Butler School of Music; the College of Communication; and other units approved by the graduate adviser in comparative literature.

## **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Omoniyi Afolabi	Tatiana Kuzmic
Kamran Ali	Wayne Lesser
Samer M Ali	Naomi E Lindstrom
Katherine M Arens	Keith A Livers
Douglas G Biow	Carol H MacKay
Marc Bizer	Lisa L Moore
Jason R Borge	Fehintola A Mosadomi
Pascale R Bos	Karen A Pagani
Daniela Bini Carter	Michael A Pesenson
Kirsten Cather	Gabriela Polit
Sung-Sheng Yvonne Chang	Guy P Raffa
Matthew Cohen	Wayne A Reborn Jr
Ann Cvetkovich	Cory A Reed
Hector Dominguez-Ruvalcaba	Peter Rehberg
Tarek Adnan El-Ariss	Elizabeth Richmond-Garza
Alison K Frazier	Sonia Roncador
Alan W Friedman	Cesar A Salgado
Thomas J Garza	Martha A Selby
John M Gonzalez	Helene Tissieres
Karen Grumberg	Chien-Hsin Tsai
Sabine Hake	Jeffrey Walker
Barbara J Harlow	Alexandra K Wettlaufer
Michael P Harney	Lynn R Wilkinson
Geraldine Heng	Jennifer M Wilks
Neville Hoad	Hannah C Wojciehowski
Syed A Hyder	Helena Woodard
Ernest N Kaulbach	Marjorie C Woods
David D Kornhaber	

## Degree Requirements

### Master of Arts

To earn the Master of Arts degree with a major in comparative literature, the student must complete either thirty-one semester hours of coursework, including the six-hour thesis course, or thirty-four hours of coursework, including the three-hour report course. The student must also demonstrate a high degree of competence in one foreign language and sufficient competence in a second language. Additional information about these requirements is available from the graduate adviser.

### Doctor of Philosophy

To be admitted to candidacy for the doctoral degree, the student must have earned a master's degree in comparative literature, in a single national language and literature, or in a related discipline such as art history, folklore, or philosophy. In addition, he or she must have passed the qualifying examination, which tests the student's knowledge of literary theory and critical methodology and of the first foreign language and literature.

The student is expected to take at least thirty semester hours of coursework beyond the Master of Arts level, including six semester hours for the dissertation. Each student must also pass a comprehensive examination, which is normally taken upon completion of coursework, and a prospectus examination, which must be taken by the end of the long-session semester after the semester in which the student passes the comprehensive examination. The student must then write a dissertation, which may involve, for example, the comparison of works, traditions, themes, writers, or periods from two or more different literatures. The dissertation may involve the study of literature and some other discipline. It may be a substantial translation, equipped with a general introduction analyzing the work chosen and/or discussing the problems and theory of translation and provided with detailed, explanatory notes. It may be some other project that the student designs under the supervision of the dissertation committee and that satisfies the aims and interests of

the program. Each student should develop a thorough command of two foreign languages, and proficiency in either a third foreign language or a relevant area of study. For the purposes of the comprehensive examination, a student may designate as the third area of study either the third foreign language or another discipline related to the program—for example, an interdisciplinary field, a set of courses linked by a critical or theoretical question, or a topic in cultural studies.

Complete information about the foreign language requirement, course requirements, and the qualifying and comprehensive examinations is available from the graduate adviser.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Comparative Literature: C L

#### C L 180K. Introduction to Comparative Literature.

One-credit-hour proseminar in methods of study and research in comparative literature. One lecture hour a week for one semester. Required of first-semester graduate students in comparative literature. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in comparative literature and consent of the graduate adviser in comparative literature.

#### C L 380M. Problems in Translation.

Detailed study of literary translations and of the translation process, and completion of one substantial translation. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser in comparative literature.

#### C L 381. The Comparative Study of Literary Periods and Movements.

The study of literary periods, aspects of periods, or movements from a comparative point of view; topics include mystical literature of the Middle Ages and Renaissance humanism. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

#### C L 382. Topics in Comparative Literature.

Study of genres, literary forms, the relationships of literature and other disciplines from a comparative point of view; topics include comedy, sensibility, and the East and the West. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

#### C L 385. Theories of Literary Criticism.

Comparative study of theories of literary criticism in a broad historical perspective, including representative classic texts in critical theory. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

#### C L 386. Literature in a Comparative Context.

A study of topics with a single primary language focus, using a strongly comparative approach. Three lecture hours a week for one semester. Some topics may be offered on the credit/no credit basis only; these are

identified in the Course Schedule. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser and instructor.

### **C L 390. Comparative Literary Theory and Poetics.**

Comparative study of major modern critical schools and figures in literary and cultural theory and criticism. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **C L 391L. Conference Course in Comparative Literature.**

Tutorial courses on individually designed basis available through the home departments of members of the comparative literature faculty. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser in comparative literature.

### **C L 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in comparative literature and consent of the graduate adviser; for 698B, Comparative Literature 698A and consent of the graduate adviser.

### **C L 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in comparative literature and consent of the graduate adviser.

### **C L 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and consent of the graduate adviser in comparative literature.

### **C L 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Comparative Literature 399R, 699R, or 999R, and consent of the graduate adviser in comparative literature.

## **Economics**

*Master of Arts  
Master of Science in Economics  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Bernard and Audre Rapoport Building (BRB) 1.116, phone (512) 471-3211, fax (512) 471-3510; campus mail code: C3100

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Economics, 2225 Speedway Stop C3100, Austin TX 78712

**URL:** <http://www.utexas.edu/cola/depts/economics/>

### **Facilities for Graduate Work**

In addition to the department resources described below, graduate students in economics may use the research facilities of the Teresa Lozano Long Institute of Latin American Studies, the Bureau of Business Research, the Population Research Center, and the Lyndon Baines Johnson Library and Museum, as well as those of the University Libraries and Information Technology Services. Also available in Austin are state government offices; regional offices of federal agencies, including the Internal Revenue Service; and the offices of several research institutions.

**Computer facilities.** The information technology environment within the department provides many different applications, hosts, software libraries, and access methods through two computer laboratories. The main laboratory has twenty-five computers, and the secondary laboratory has six computers. Primary research computing is done using applications such as MATLAB, Mathematica, SAS, GAMS, Stata, and Gauss. Many users also have their own desktops and processing environments.

Students may access all the applications that the servers provide, as well as typical office applications in the Windows environment. The department has wireless access to UTnet as well.

### **Areas of Study**

The Department of Economics offers graduate study and research in the core areas of microeconomics, macroeconomics, and econometrics and in a broad selection of applied areas. Current area offerings are listed on the department's Web site (<http://www.utexas.edu/cola/depts/economics>).

### **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Jason Abrevaya	Tim Landvoigt
Andres Almazan	Leigh L Linden
Venkataraman Bhaskar	Stephen P Magee
Chandra R Bhat	Dayanand Manoli
Saroj Bhattacharai	Eugenio J Miravete
Sandra E Black	Richard Murphy
Svetlana Boyarchenko	Gerald S Oettinger
Marika Cabral	Brian E Roberts
Olivier Coibion	Stephen Patrick Ryan
Stephen Donald	David S Sibley
Richard Dusansky	Daniel T Slesnick
Michael L Geruso	Dale O Stahl II
Andrew Stephen Glover	Maxwell B Stinchcombe
Sukjin Han	Caroline Desiree Thomas
John William Hatfield	Sheridan Titman
Carolyn Heinrich	Stephen J Trejo
Matthias Kehrig	Andrew B Whinston
David A Kendrick	Thomas E Wiseman
Brendan Andrew Kline	Haiqing Xu

### **Admission Requirements**

Applicants should have completed at least twelve semester hours of upper-division coursework in economics, including three hours each in intermediate-level microeconomic and macroeconomic theory. The applicant should also have a firm grounding in differential and integral calculus, with an emphasis on proofs; matrix algebra; and probability theory. Exposure to advanced calculus, analysis, and topology is also desirable. Applicants may apply directly to the PhD and Master of Arts (Option III) degree programs. Admission to the Master of Arts (Option I) degree program is restricted to students who are currently pursuing graduate study in economics or another related field. Students who have taken the prescribed coursework for the doctoral degree normally qualify for a Master of Science in Economics by the end of their fourth semester in the program, or for the Master of Arts after their third semester.

### **Degree Requirements**

#### **Master of Arts**

The Master of Arts Option I degree program offers a research-based curriculum and requires completion of thirty semester hours of coursework, including Economics 386C (*Microeconomics I*), 387C

(*Macroeconomics I*), and Economics 698, *Thesis*. At least eighteen semester hours, including the thesis, must be in the major area, and at least six hours must be in supporting work. The Program of Work may include up to nine hours of upper-division undergraduate work, no more than six hours of which may be in either the major or the supporting work. The student must take at least twenty-one semester hours in economics and either six or nine hours of approved coursework outside economics. He or she must earn separate grade point averages in economics and in the supporting work of at least 3.00.

The Master of Arts Option III degree program is designed for students pursuing a terminal master's degree in economics. This program requires completion of thirty semester hours of coursework, including Economics 394K, *Microeconomics*, Economics 394L, *Macroeconomics*, and Economics 394M, *Econometrics*. The Program of Work may include approved graduate coursework within economics or approved substitutes. The student must earn a grade of at least C+ in each of the three required courses specified above. He or she must earn a grade point average of at least 3.00.

## Master of Science in Economics

This degree program requires completion of at least thirty-six semester hours of coursework, including Economics 386C (*Microeconomics I*), 387C (*Macroeconomics I*), and 388C (*Econometrics I*). At least eighteen semester hours must be in the major area, and at least six hours must be in supporting work. The program may include no more than nine hours of upper-division undergraduate work, no more than six hours of which may be in either the major or the supporting work. In addition to the required courses listed above, the student must complete two courses in one of the areas of study offered by the department; he or she must also take either two courses in a second area or Economics 388D (*Econometrics II*). No more than six hours of work may be taken on the credit/no credit basis; neither the required courses nor the courses in the two areas may be taken on this basis. The student must earn separate grade point averages in economics and in the supporting work of at least 3.00.

## Doctor of Philosophy

The doctoral degree is based on satisfactory performance in courses, examinations, writing requirements, and completion of a dissertation. The student seeking admission to candidacy for the doctoral degree is required to take eight core courses: Economics 386C (*Microeconomics I*), 387C (*Macroeconomics I*), 386D (*Microeconomics II*), 387D (*Macroeconomics II*), 385D (*Mathematics for Economists*), 388C (*Econometrics I*), 388D (*Econometrics II*), and 385C (*Probability and Statistics*). Comprehensive examinations in microeconomics and macroeconomics are administered in June and August. In order to continue in the doctoral program, students must pass at least one comprehensive examination by the summer following their first year and both by the June examination date following their second year.

The student's program must include at least twenty-four semester hours of approved coursework taken in residence. In addition to the core courses, the student must complete two graduate courses in each of two elective fields of specialization. The elective fields are designed to prepare students to write a single-authored second-year paper to be submitted at the June examination date. A departmental graduate research committee evaluates the second-year paper, provides the student with written feedback for revision, and makes a final pass/fail decision by the August examination date. Students must receive a passing grade on the second-year paper to continue in the doctoral program. In the third year, students are required to take a writing seminar, Economics 387M, each semester in one of their fields, as well as two elective courses. All students must present their research papers in the writing workshop of their area of specialization by the end of the fall semester of their fourth year. The

paper and presentation must be deemed acceptable by the workshop faculty coordinator and one other faculty member of the student's choosing. By the beginning of the fourth year, the student is strongly advised to have formed a committee and planned chapters of his or her dissertation in order to declare candidacy. In the fourth and subsequent years, students are expected to take Economics 387M each semester to guide them through writing research papers for their dissertation. In general, three papers comprise a dissertation. A final oral defense completes the doctoral degree program.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Economics: ECO

#### ECO 380. Research Course.

May be repeated for credit. Prerequisite: Graduate standing and consent of instructor and the graduate adviser in economics.

#### ECO 180D, 380D. Internship in Economics.

Restricted to economics graduate students. Practical working involvement with an appropriate business, government or research agency, or similar institution. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester; additional hours to be arranged. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

#### ECO 380M. Regional Economics.

Survey of theoretical and empirical literature related to location theory, regional development, regional disparities, growth and function of cities, and political economy of spatial planning. Three lecture hours a week for one semester. Prerequisite: Graduate standing, six semester hours of upper-division coursework in economics, and six additional semester hours of upper-division coursework in social science or business.

#### ECO 380N. Urban Economics.

Provides an economic analysis of pressing urban problems such as poverty, housing, transportation, environment, and finance. Three lecture hours a week for one semester. With consent of instructor, may be repeated for credit when the topics vary. Prerequisite: Graduate standing, six semester hours of upper-division coursework in economics, and six additional semester hours of upper-division coursework in social science or business.

#### ECO 381K. Seminar in Money and Banking.

Topics include monetary policy and problems, theory of central banking, and money and banking history. The equivalent of three lecture hours a week for one semester. With consent of instructor, may be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### ECO 383K. Seminar in General Economic History.

Same as History 383L. A historical study of economic development and economic policy. The equivalent of three lecture hours a week for one semester. With consent of instructor, may be repeated for credit when the topics vary. Prerequisite: Graduate standing, six semester hours of upper-division coursework in economics or related history or government,

and six additional semester hours of upper-division coursework in social science or business.

### **ECO 384G. Seminar in International Economics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: International Trade.** Economics 384G (Topic 1) and 397 (Topic: International Trade) may not both be counted.

**Topic 2: International Finance.** Economics 384G (Topic 2) and 397 (Topic: International Finance) may not both be counted.

### **ECO 384H. Seminar in Public Finance.**

Analysis of public expenditure and taxation. Three lecture hours a week for one semester. Economics 382L and 384H may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **ECO 384J. Seminar in Development Economics.**

Analysis includes theories of economic development and planning. Three lecture hours a week for one semester. Economics 380K and 384J may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **ECO 384K. Industrial Organization.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Introduction to Industrial Organization.**

**Topic 2: Industrial Organization and Regulation.**

### **ECO 384N. Resource Economics.**

Definition, measurement, production, and conservation of renewable and exhaustible resources; models of economic growth and resources; world distribution and consumption; United States resource policy. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Natural Resource Economics.**

**Topic 2: Environmental Economics.**

### **ECO 385C. Probability and Statistics.**

Three lecture hours a week for one semester. Economics 385C and 392M (Topic 19) may not both be counted. Prerequisite: Graduate standing.

### **ECO 385D. Mathematics for Economists.**

Three lecture hours a week for one semester. Economics 385D and 392M (Topic 8) may not both be counted. Prerequisite: Graduate standing.

### **ECO 385K. Labor Economics.**

Analysis of the empirical and theoretical factors that influence labor markets. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Introduction to Labor Economics.**

**Topic 2: Topics in Labor Economics.**

### **ECO 386C. Microeconomics I.**

Three lecture hours a week for one semester. Economics 386C and 387L (Topic 1) may not both be counted. Prerequisite: Graduate standing.

### **ECO 386D. Microeconomics II.**

Three lecture hours a week for one semester. Economics 386D and 387L (Topic 3) may not both be counted. Prerequisite: Graduate standing.

### **ECO 386E. Seminar in Advanced Microeconomics.**

Three lecture hours a week for one semester. Economics 386E and 387L may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Introduction to Game Theory.** Economics 386E (Topic 1) and 387L (Topic 27) may not both be counted.

**Topic 2: Applications of Game Theory.** Economics 386E (Topic 2) and 387L (Topic 28) may not both be counted.

**Topic 3: Advanced Microeconomic Analysis.** Economics 386E (Topic 3) and 387L (Topic 26) may not both be counted.

**Topic 4: Mathematical Economics.** Economics 386E (Topic 4) and 387L (Topic 24) may not both be counted.

**Topic 5: Experimental Methods in Economics.**

### **ECO 387C. Macroeconomics I.**

Three lectures a week for one semester. Economics 387C and 387L (Topic 2) may not both be counted. Prerequisite: Graduate standing.

### **ECO 387D. Macroeconomics II.**

Three lecture hours a week for one semester. Economics 387D and 387L (Topic 4) may not both be counted. Prerequisite: Graduate standing.

### **ECO 387E. Seminar in Advanced Macroeconomics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Advanced Macroeconomic Analysis I.** Economics 387E (Topic 1) and 387L (Topic 15) may not both be counted.

**Topic 2: Advanced Macroeconomic Analysis II.**

### **ECO 387K. Monetary Theory.**

Theories, based on microeconomic foundations, covering such topics as the usefulness of monetary exchange, optimal central bank policy, the interaction of monetary and fiscal policy, and the role of financial intermediation in the macroeconomy. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **ECO 387M. Writing Seminar in Economics.**

The equivalent of three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **ECO 187N. Survey of Fields in Economics.**

Introduction to the questions, methods, and scope of research in different fields in economics. One lecture hour a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **ECO 388C. Econometrics I.**

Three lecture hours a week for one semester. Economics 388C and 392M (Topic 2) may not both be counted. Prerequisite: Graduate standing.

### **ECO 388D. Econometrics II.**

Three lecture hours a week for one semester. Economics 388D and 392M (Topic 3) may not both be counted. Prerequisite: Graduate standing.

### **ECO 388E. Seminar in Advanced Econometrics.**

Three lecture hours a week for one semester. Economics 388E and 392M may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Advanced Econometric Theory I.** Economics 388E (Topic 1) and 392M (Topic 6) may not both be counted.

**Topic 2: Advanced Econometric Theory II.** Economics 388E (Topic 2) and 392M (Topic 7) may not both be counted.

**Topic 3: Applied Microeconometrics.** Economics 388E (Topic 3) and 392M (Topic 4) may not both be counted.

**Topic 4: Time-Series Analysis.** Economics 388E (Topic 4) and 392M (Topic 5) may not both be counted.

**Topic 5: Applied Macroeconometrics.** Economics 388E (Topic 5) and 392M (Topic 15) may not both be counted.

### **ECO 390L. Seminar in the History of Economic Thought.**

Survey and analysis of principal contributions and historical influences in the evolution of contemporary economic thought from the late eighteenth through the early twentieth century. Three lecture hours a week for one semester. With consent of instructor, may be repeated for credit when the topics vary. Prerequisite: Graduate standing, and completion of core courses in economic theory or consent of instructor.

### **ECO 492L. Quantitative Methods in Economics.**

Topics include optimization methods, probability theory, and statistical inference. Four lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **ECO 393. Seminar in Industrial Organization.**

The equivalent of three lecture hours a week for one semester. With consent of instructor, may be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **ECO 394C. Mathematics for Economists.**

Restricted to master's students in the economics option III program. Mathematical tools widely used for economic analysis, including advanced calculus, optimization methods, linear algebra, and dynamic systems. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **ECO 394D. Probability and Statistics.**

Restricted to master's students in the economics option III program. Probability theory and statistical methods used in economics and econometrics. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **ECO 394K. Microeconomics.**

Restricted to master's students in the economics option III program. Rigorous introduction to the methods of microeconomic theory, including consumer and producer theory, decision under uncertainty, markets and competition, and general equilibrium. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **ECO 394L. Macroeconomics.**

Restricted to master's students in the economics option III program. Dynamic optimization concepts and methods used in modern macroeconomics. General equilibrium applications in the areas of economic growth, business cycles, and the role of monetary and fiscal policy. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **ECO 394M. Econometrics.**

Restricted to master's students in the economics option III program. Identification and estimation of linear and nonlinear regression models; inference and hypothesis testing. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **ECO 395K. Topics and Applications in Microeconomics.**

Restricted to option III economics master's degree students. Three lecture hours a week for one semester. May be repeated for credit when the

topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

**Topic 1: Game Theory.** Restricted to master's students in the economics option III program. Introduction to game theoretic concepts and analyses and their application to study strategic interactions between individuals, firms, and other economic agents. Three lecture hours a week for one semester. Offered on the letter-grade basis only.

### **ECO 395L. Topics and Applications in Macroeconomics.**

Restricted to master's students in the economics option III program. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **ECO 395M. Topics and Applications in Quantitative Methods.**

Restricted to master's students in the economics option III program. Three lecture hours per week for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **ECO 396. Studies in Economic History.**

The equivalent of three lecture hours a week for one semester. With consent of instructor, may be repeated for credit when the topics vary. Prerequisite: Graduate standing, six semester hours of upper-division coursework in economics, and six additional semester hours of upper-division coursework in social science or business.

### **ECO 397. Seminar in International Economic Problems.**

The equivalent of three lecture hours a week for one semester. With consent of instructor, may be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **ECO 297K. Specialized Topics in Microeconomics.**

Restricted to option III economics master's degree students. Two lecture hours a week for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **ECO 297L. Specialized Topics in Macroeconomics.**

Restricted to option III economics master's degree students. Two lecture hours a week for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **ECO 297M. Specialized Topics in Quantitative Methods.**

Restricted to option III economics master's degree students. Two lecture hours a week for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **ECO 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in economics, twelve semester hours of upper-division or graduate coursework in economics, and consent of the graduate adviser; for 698B, Economics 698A.

### **ECO 198K. Specialized Topics in Microeconomics.**

Restricted to students in the Option III economics master's degree program. One lecture hour a week for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **ECO 198L. Specialized Topics in Macroeconomics.**

Restricted to students in the Option III economics master's degree program. One lecture hour a week for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **ECO 198M. Specialized Topics in Quantitative Methods.**

Restricted to students in the Option III economics master's degree program. One lecture hour a week for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **ECO 398T. Supervised Teaching in Economics.**

Teaching under the close supervision of the course instructor; weekly group meetings, individual consultations, and reports. Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and appointment as a teaching assistant.

### **ECO 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and consent of the graduate adviser.

### **ECO 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Economics 399R, 699R, or 999R.

## **English**

*Master of Arts  
Master of Fine Arts (in Creative Writing)  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Calhoun Hall (CAL) 210, phone (512) 471-5132 or (512) 475-6356; campus mail code: B5000

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of English, 204 West 21st Street Stop B5000, Austin TX 78712

**E-mail:** gradeng@uts.cc.utexas.edu

**URL:** <http://www.utexas.edu/cola/depts/english/>

### **Facilities for Graduate Work**

Facilities for graduate work include an excellent library system and a world-renowned research library, the Harry Ransom Center. The Ransom Center provides materials for critical, textual, and bibliographical studies, with its extensive holdings in earlier British literature (including the Pforzheimer Library), modern British and American literature, theatre arts, photography, and other significant subjects for literary and cultural research. The Benson Latin American Collection is one of many campus resources for advanced work in non-European literature and language. The Department of Rhetoric and Writing offers rich opportunities for teaching and study; and the Digital Writing and Research Laboratory enjoys a national reputation for investigating the intersections among technology, language, and literature.

### **Areas of Study**

Courses are offered in the following areas of study: American literature; bibliography and textual studies; digital literacies and literatures; drama; eighteenth-century British literature; ethnic and Third World literatures; language and linguistics; medieval literary studies; modern British literature; nineteenth-century British literature; Renaissance literature;

poetry and poetics; cultural studies; rhetoric; and women, gender, and literature.

The department also offers workshops in poetry and fiction for students enrolled in the MFA program, as well as craft seminars in fiction, poetry, and creative non-fiction.

## **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Michael W Adams	Ernest N Kaulbach
Samuel Baker	Martin W Kevorkian
Janine Barchas	Sara E Kimball
Jennifer-Kate Barret	David D Kornhaber
Phillip J Barrish	Donna Marie Kornhaber
Chad J Bennett	Peter N Lasalle
Lance Bertelsen	Wayne Lesser
Daniel J Birkholz	James N Loehlin
Mary E Blockley	Mark G Longaker
Casey A Boyle	Edward A Macduffie III
Brian A Bremen	Carol H MacKay
Douglas S Bruster	James L Magnuson
Jerome F Bump	Eric S Mallin
Mia E Carter	Elizabeth McCracken
Evan B Carton	Julie A Minich
Larry D Carver	Lisa L Moore
Oscar H Casares	Gretchen Murphy
Dauida H Charney	Neil R Nehring
Matthew Cohen	Lisa Olstein
James H Cox	Deborah A Paredes
Elizabeth Cullingford	Domino R Perez
Ann Cvetkovich	Wayne A Rebhorn Jr
D D Davis	Matt T Richardson
Rasha Diab	Elizabeth Richmond-Garza
Lester L Faigley	Patricia Roberts-Miller
Linda Ferreira-Buckley	John P Rumrich
Alan W Friedman	John J Ruszkiewicz
James D Garrison	Elizabeth D Scala
John M Gonzalez	Snehal A Shingavi
Don B Graham	Clay Spinuzzi
Ian F Hancock	Margaret A Syverson
Barbara J Harlow	Deborah Unferth
Elizabeth A Hedrick	Jeffrey Walker
Kurt O Heinzelman	Frank F Whigham Jr
Susan S Heinzelman	Thomas B Whitbread
Geraldine Heng	Jennifer M Wilks
Jacqueline M Henkel	Michael B Winship
R Roland Hinojosasmith	Hannah C Wojciehowski
Lars Hinrichs	Helena Woodard
Neville Hoad	Marjorie C Woods
Heather Houser	Dean H Young
Coleman Hutchison	

## **Degree Requirements**

### **Master of Arts**

A total of thirty semester hours of coursework is required. The department does not admit literature and rhetoric students for a terminal Master of Arts degree. Students are required to complete a master's report. Details are available from the graduate adviser.



As preparation for the English graduate program, a strong undergraduate background in British and American literature and language is desirable, as well as advanced coursework in related fields.

## Master of Fine Arts (in Creative Writing)

The Master of Fine Arts degree is offered in creative writing. Students choose to write either fiction or poetry. A total of thirty-six semester hours of coursework is required during the two-year program of study. As a part of the program of study, students work as teaching assistants for undergraduate literature and creative writing courses. Students complete the MFA degree program with a successful master's project displaying their talent and craft as fiction writers or poets.

## Doctor of Philosophy

To enter the doctoral degree program, all master's-level students must pass a qualifying review which focuses on their graduate coursework, their master's report, and their performance as teachers. With the consent of the graduate adviser, students who enter the program with a Master of Arts degree from another university may be eligible for exemption from the review. Students who began their graduate work at the University must pass the review at the end of the spring semester of the second year of graduate study.

After passing the qualifying review, the student completes a minimum of twenty-four hours of additional coursework; specific requirements are available from the graduate adviser. Students who began graduate study at another institution may petition the graduate adviser to transfer applicable credit to the Program of Work. Students advance to candidacy for the doctoral degree after completing their coursework, certifying their foreign language competency, and passing both the field examination and the prospectus examination.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### English: E

#### E 380E. Practicum in Editing.

A practicum for editing a literary journal. Three lecture hours a week for one semester. May be repeated for credit when the topics or instructors vary. Prerequisite: Graduate standing, admission to the creative writing concentration in English, and consent of the English graduate adviser.

#### E 380F. Literature for Writers.

Readings in fiction, poetry, drama, literary criticism, biography, and autobiography from the point of view of a creative writer rather than that of a scholar. Three lecture hours a week for one semester. May be repeated for credit when the instructors vary. Prerequisite: Graduate standing and consent of the English graduate adviser.

#### E 382J. Studies in Linguistic Analysis.

Lectures, textual analysis, outside readings. Three lecture hours a week for one semester. May count as linguistics. Prerequisite: Graduate standing and consent of the English graduate adviser.

#### E 382L. Studies in Linguistics and Literature.

Intensive study of specialized subjects. Three lecture hours a week for one semester. May count as linguistics. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the English graduate adviser.

#### E 383L. The Teaching of English Composition and Literature.

A study of the major components of the English program in secondary school or college. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the English graduate adviser.

#### E 384K. Methods of Literary Research.

Topics include bibliography, textual studies, history of the book, and materials of literary research. Three class hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the English graduate adviser.

**Topic 1: Introduction to Research Methods.** Only one of the following may be counted: English 384K (Topic 1), 384K (Topic: Methods of Literary Research), 384K (Topic: Research in Literary Methods).

#### E 385N. Creative Writing: Workshop in Fiction.

Three lecture hours a week for one semester. May be repeated for credit when the instructors vary. Prerequisite: Graduate standing and consent of instructor and the English graduate adviser.

#### E 385P. Creative Writing: Advanced Workshop in Fiction.

Three lecture hours a week for one semester. May be repeated for credit when the instructors vary. Prerequisite: Graduate standing and consent of instructor and the English graduate adviser.

#### E 386L. Creative Writing: Workshop in Poetry.

Three lecture hours a week for one semester. May be repeated for credit when the instructors vary. Prerequisite: Graduate standing and consent of instructor and the English graduate adviser.

#### E 386M. Creative Writing: Advanced Workshop in Poetry.

Three lecture hours a week for one semester. May be repeated for credit when the instructors vary. Prerequisite: Graduate standing and consent of instructor and the English graduate adviser.

#### E 387M. Studies in Rhetoric.

Advanced study of topics in rhetorical theory and in ancillary disciplines. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the English graduate adviser.

#### E 387N. Methods of Research in Rhetoric and Composition.

A study of the theory, practice, and history of research in rhetoric and composition. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the English graduate adviser.

#### E 387P. Productions in Rhetoric.

Applications of rhetoric to professional writing. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the English graduate adviser.

#### E 387R. Rhetorical History.

Topics include classical rhetoric, medieval and Renaissance rhetoric, eighteenth- and nineteenth-century rhetoric, and twentieth-century rhetoric. Three lecture hours a week for one semester. May be repeated

for credit when the topics vary. Prerequisite: Graduate standing and consent of the English graduate adviser.

### **E 388M. Studies in English and Computers.**

Seminar on research in English literature, language, and rhetoric. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the English graduate adviser.

### **E 389M. Studies in British and American Literature.**

Selected British and American writers and issues. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the English graduate adviser.

### **E 389P. Studies in Women, Gender, and Literature.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the English graduate adviser.

### **E 390J. Humanities Seminar.**

Interdisciplinary seminar taught by Humanities Institute Fellows on topics selected annually. Designed for advanced graduate students with relevant research projects or interests. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### **E 390M. Studies in European Literature.**

A study of the impact of European writers on British or American literature. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the English graduate adviser.

### **E 391L, 691L. Conference Course on Special Topics.**

For each semester hour of credit earned, the equivalent of one class hour a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the English graduate adviser.

### **E 392M. Studies in English Literature.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the English graduate adviser.

### **E 393M. Studies in Criticism, English and American.**

Historical and methodological approaches to literary criticism. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the English graduate adviser.

### **E 395M. Studies in American Literature.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the English graduate adviser.

### **E 395N. Studies in the History of Language.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the English graduate adviser.

**Topic 1: Old English.** English 364P and 395N (Topic 1) may not both be counted.

**Topic 2: Middle English.**

**Topic 3: Renaissance English.**

### **E 396L. Studies in the English Language.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the English graduate adviser.

#### **Topic 1: Prosody.**

### **E 397M. Studies in the Literatures and Cultures of the English-Speaking World.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the English graduate adviser.

### **E 397N. Studies in Ethnic and Third-World Literatures.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the English graduate adviser.

### **E 698. Thesis.**

Research and writing of a thesis under the supervision of the chair of the supervising committee and subject to the approval of the committee and the graduate dean. The equivalent of three lecture hours a week for two semesters. English 698A may not be repeated for credit. The student must register for 698B the semester he or she intends to graduate. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in creative writing; for 698B, English 698A.

### **E 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in English and consent of the graduate adviser.

### **E 398T. Supervised Teaching in English.**

Three lecture hours a week for one semester. May be repeated once for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, consent of the English graduate adviser, and appointment as a teaching assistant or assistant instructor in a lower-division English course in literature or writing.

### **E 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **E 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: English 399R, 699R, or 999R.

## **European Studies**

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### **European Studies: EUS**

#### **EUS 381. Advanced Topics in European Studies.**

Examination of recent developments in Europe, with emphasis on the role of the European Union in political, cultural, economic, and security matters. Three lecture hours a week for one semester or as required by

the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

## French and Italian

*Master of Arts (in French)*  
*Master of Arts (in Italian Studies)*  
*Doctor of Philosophy (in French)*  
*Doctor of Philosophy (in Italian Studies)*

### For More Information

**Campus address:** Rainey Hall (HRH) 2.110A, phone (512) 471-5531, fax (512) 471-8492; campus mail code: B7600

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of French and Italian, 201 West 21st Street Stop B7600, Austin TX 78712

**E-mail:** catherine@austin.utexas.edu

**URL:** <http://www.utexas.edu/cola/depts/frenchitalian/>

### Facilities for Graduate Work

The University offers excellent resources to serve the needs of graduate students in French and Italian. Among the outstanding collections are the Carlton Lake collection of manuscripts and rare editions of modern French writers from Baudelaire to Beckett, the papers of the Princess Bibesco, the Artinian collection of Guy de Maupassant material, and the Surrealist archive of reviews and original documents. The Italian collections (Ranuzzi, Aldine, Medici, Bodoni, Parsons, and Weinreb) in the Harry Ransom Center offer medieval and Renaissance manuscripts and incunabula, as well as thousands of manuscripts from modern and contemporary writers such as Luigi Pirandello, Paolo Volponi, and Carlo Levi. The Suida-Manning Collection, in the Blanton Museum of Art, is one of the finest collections of Renaissance and Baroque art in the United States and constitutes another world-class resource for graduate study.

Several multimedia language laboratories, equipped with the latest digital aids, furnish excellent opportunities for technical and professional preparation for teaching and research in Romance languages and linguistics. A large collection of recordings of dialect materials in the Romance languages is also available.

### Areas of Study

Graduate programs in French include concentrations in French studies (literature, film, and culture) and linguistics. The program in Italian studies addresses Italian literature, cinema, and culture.

## French

### Degree Requirements

#### Master of Arts

The master's degree program in French requires that the candidate have a bachelor's degree with a major in French or demonstrate equivalent knowledge. Master of Arts degree plans are available with a concentration in French studies or linguistics and may be awarded *en passant* to the Ph.D. provided that the student fulfills the requirements described below.

The program in French studies requires thirty-seven semester hours of coursework, including two courses outside the department. French studies majors are required to take French 381M and at least one course in seven

literary periods. All incoming students are required to take the proseminar, French 180P, in their first semester of graduate study.

Completion of the program in linguistics requires four semesters or thirty-seven semester hours of coursework with a minimum of twenty-four semester hours of coursework in French linguistics. All incoming students are required to take the proseminar, French 180P, in their first semester of graduate study.

### Doctor of Philosophy

The doctoral program is offered in French studies and linguistics. The departmental proseminar is required of all incoming graduate students. Information about required courses in each of these areas is available from the department. An examination committee is formed for each candidate; with the graduate adviser, the committee oversees the student's progress and eventually administers a comprehensive examination based on coursework and reading lists. The Comprehensive Examination will consist of a two-hour oral examination conducted by three to four faculty members. One of the faculty members conducting the examination may come from outside the program. Eighteen to thirty-six semester hours of coursework beyond the master's are normally required for the degree. An approved dissertation prospectus is required for all doctoral candidates before they may begin to write the dissertation. A final oral defense of the dissertation is required of all candidates.

In French studies, the candidate is expected to take courses outside of the department in related areas of interest, such as French history, art history, comparative literature, and anthropology. Candidates must pass a comprehensive exam on three areas of expertise before beginning work on the dissertation. For the concentration in French studies, students are required to have an adequate knowledge of a modern language (in addition to French and English) or a basic knowledge of Latin.

In French linguistics, the candidate must take coursework in each of the five areas of specialization: historical linguistics; sociolinguistics and dialectology; syntax and semantics; phonology and morphology; and language acquisition and applied linguistics. Each candidate is expected to complete at least two courses in areas outside of French linguistics, such as English, history, linguistics, philosophy, psychology, or other languages. Coursework completed for the master's degree may be counted toward this requirement. Candidates must be examined on three of the five areas of specialization of their choice. For the concentration in French linguistics, students are required to have an adequate knowledge of a modern language (in addition to French and English) or a basic knowledge of Latin.

### Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

David P Birdsong	David D Kornhaber
Marc Bizer	Richard P Meier
Carl S Blyth	Jean-Pierre Montreuil
Benjamin C Brower	Karen A Pagani
Barbara Ellen Bullock	Herve Picherit
Mounira M Charrad	Marc Pierce
Judith G Coffin	Cinzia Russi
Tarek Adnan El-Ariss	Helene Tissieres
Patience L Epps	Almeida J Toribio
Zenzi M Griffin	Alexandra K Wettlaufer
Julie Hardwick	Lynn R Wilkinson
Lars Hinrichs	

# Italian

## Degree Requirements

### Master of Arts

The master's degree program in Italian studies requires that the candidate have a bachelor's degree with a major in Italian or demonstrate equivalent knowledge. A Master of Arts in Italian studies may be awarded *en passant* to the Ph.D provided that the student fulfills the requirements described below.

The program requires thirty-six semester hours of coursework, which may include one three-hour upper-division undergraduate course approved by the graduate adviser. Students must take at least twenty-four semester hours of graduate coursework in Italian literature, cinema, and culture offered by the Italian graduate faculty of the Department of French and Italian, and six to nine graduate-level semester hours in a supporting subject or subjects in another program, department, or college. Italian studies students must take Comparative Literature 385, French 381M, or another graduate course on critical or literary theory approved by the graduate adviser. Students must also demonstrate reading competence in one foreign language other than Italian by earning a grade of at least *B* in a reading course approved by the graduate adviser, in a second-year college language course, or on an examination approved by the graduate adviser.

### Doctor of Philosophy

Several courses are required of all doctoral candidates; information about them is available from the department. An examination committee is formed for each candidate; with the graduate adviser, the committee oversees the student's progress and eventually administers a comprehensive examination based on coursework and reading lists.

Although the doctoral degree is not awarded on the basis of a specific number of courses or semester hours of credit, six courses (or eighteen semester hours) beyond the master's degree are usually required. With the approval of the graduate adviser, one of these courses may be an undergraduate course that satisfies the requirement for proficiency in a foreign language other than Italian. With the help of the graduate adviser, each student is expected to design an individual course of study and define a primary subject and supporting subject(s) of study. The graduate adviser must approve the student's selection of courses; at least nine hours of coursework must be in one supporting subject. Students must also demonstrate reading competence in a foreign language other than Italian by earning a grade of at least *B* in a reading course approved by the graduate adviser, in a fourth-semester college course, or on an examination approved by the graduate adviser.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Miroslava M Benes	Alison K Frazier
Douglas G Biow	Luisa Nardini
Paola Bonifazio	Guy P Raffa
Daniela Bini Carter	Wayne A Rebhorn Jr
Joseph C Carter	Cinzia Russi
John R Clarke	Rabun M Taylor
Penelope J Davies	Maurizio Viroli
Andrew F Dell'Antonio	Louis A Waldman
Robert A Desimone	Hannah C Wojciehowski

# Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## French: FR

### FR 380C. French for Graduate Students in Other Departments.

No auditors permitted. Intensive reading course, emphasizing basic grammar and vocabulary with translation practice. Three lecture hours a week for one semester. The symbol CR fulfills the foreign language requirement for the Doctor of Philosophy degree in some departments. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### FR 380L. History of the French Language.

An analysis of the evolution of the French language since its origin. Three lecture hours a week for one semester. Prerequisite: Graduate standing in French, or graduate standing and six semester hours of upper-division coursework in French.

### FR 180P. Introduction to Studies in Literature and Culture.

Proseminar in methods of study and research in French studies. One lecture hour a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### FR 380R. Reference Works and Research Methodologies.

Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### FR 381. Old French Language.

Three lecture hours a week for one semester. Prerequisite: Graduate standing and twelve semester hours of upper-division coursework in French.

### FR 381J. Topics in French Studies.

Designed for students in other departments; taught in English with optional reading in French. Three lecture hours a week for one semester. Graduate students in French may count only one topic toward the degree. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### FR 381M. Critical Approaches to Literature.

Introduction to various modern approaches to literary criticism, stressing both theory and practical application. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### FR 381N. Studies in Language and Style.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Rhetoric, Composition, and Stylistics.**

**Topic 2: Translation.**

**FR 381P. Old Provençal.**

An introduction to Old Provençal through analysis of literary texts. Three lecture hours a week for one semester. Prerequisite: Graduate standing and twelve semester hours of upper-division coursework in French.

**FR 382L. Studies in the Civilization of the French-Speaking World.**

Studies in various aspects of the cultures of France, Quebec, Francophone Africa, the French Caribbean, and other areas. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

**FR 383K. Structure of French: Phonology and Morphology.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing in French, or graduate standing in linguistics and six semester hours of upper-division coursework in French.

**FR 383M. Structure of French: Syntax and Semantics.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing in French, or graduate standing in linguistics and six semester hours of upper-division coursework in French.

**FR 383N. Introduction to French Linguistics.**

An introductory survey of the main fields of French linguistics: phonology, syntax, sociolinguistics, historical linguistics, and applied linguistics. Three lecture hours a week for one semester. Fulfills linguistics requirement for doctoral candidates in French literature. May not be counted toward a graduate degree in French linguistics or Romance linguistics. Prerequisite: Graduate standing.

**FR 385L. Conference Course in French Language and Literature.**

For students needing specialized courses not normally or not often included in the regular course offerings. Three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and written consent of the graduate adviser.

**FR 390K. Studies in French Literature through the Renaissance.**

Intensive study of particular writers or literary movements. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and twelve semester hours of upper-division coursework in French.

**FR 390L. Studies in French Literature of the Seventeenth and Eighteenth Centuries.**

Intensive study of particular writers or literary movements. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and twelve semester hours of upper-division coursework in French.

**FR 390M. Studies in French Literature from the Nineteenth Century to the Present.**

Intensive study of particular writers or literary movements. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and twelve semester hours of upper-division coursework in French.

**FR 390N. Studies in Francophone Literature.**

Studies in the literatures of Quebec, Francophone Africa, the French Caribbean, and other areas. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**FR 391K. Studies in Criticism and Literary Genres.**

Intensive study of critical theory or of the evolution of a genre. Topics: *Le Voyage*: themes, genres, structure; French short fiction since 1650; the theatre of the absurd; and others. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and twelve semester hours of upper-division coursework in French.

**FR 392K. Studies in French Linguistics.**

Examination of specific issues in theoretical, applied, descriptive, or historical linguistics. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and twelve semester hours of upper-division coursework in French.

**FR 395L. Comprehensive Examination Preparation.**

Restricted to doctoral students in the Department of French and Italian. Supervised preparation for the comprehensive examination for the doctoral degree. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate Standing, consent of the graduate adviser, and satisfactory completion of all course requirements for the doctoral degree.

**FR 396K. Comparative Romance Linguistics.**

General survey of the development of spoken Latin in Italy, Spain, Portugal, and France; main traits of phonology, morphology, and syntax in each modern derivative language. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in languages and consent of instructor and the graduate adviser.

**Topic 1: Introduction to Romance Linguistics.** Same as Italian 396K (Topic 1: Introduction to Romance Linguistics), Linguistics 383 (Topic 3: Introduction to Romance Linguistics), Portuguese 396K (Topic 2: Introduction to Romance Linguistics), and Spanish 396K (Topic 2: Introduction to Romance Linguistics).

**FR 197T. Practicum in Teaching College French.**

Designed to train first-year teaching assistants to observe, describe, and evaluate foreign language instruction and testing. Practical aspects of teaching to be studied include organization of class time; treatment of vocabulary and grammar; speaking and pronunciation; listening and reading comprehension; evaluating and creating tests; testing language content and language skills. One lecture hour a week for one semester. Prerequisite: Graduate standing.

**FR 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in French and consent of the graduate adviser; for 698B, French 698A.

**FR 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in French and consent of the graduate adviser.

**FR 398T. Supervised Teaching in French.**

Teaching under the close supervision of the course instructor for two semesters; weekly group meetings with the instructor, individual consultations, and reports throughout the teaching period. Three lecture hours a week for one semester. Prerequisite: Graduate standing and appointment as a teaching assistant.

### **FR 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **FR 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: French 399R, 699R, or 999R.

## **Italian: ITL**

### **ITL 380C. Italian for Graduate Students in Other Departments.**

No auditors permitted. Intensive reading course, emphasizing basic grammar and vocabulary with translation practice. Three lecture hours a week for one semester. The symbol CR fulfills the foreign language requirement for the Doctor of Philosophy degree in some departments. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **ITL 380L. History of the Italian Language.**

Survey of the development of Italian from spoken Latin to the present day. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **ITL 180P. Introduction to Studies in Literature and Culture.**

Proseminar in methods of study and research in Italian Studies. One lecture hour a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### **ITL 381. Readings in Italian Literature.**

Intensive study of a period or a major writer. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and six semester hours of upper-division coursework in Italian.

### **ITL 382. Topics in Italian Studies.**

Study of various aspects and periods of Italian culture and society. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **ITL 383K. Studies in Italian Language.**

Synchronic approach to the modern Italian language: phonology, morphology, syntax, lexicology, stylistics. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **ITL 385L. Conference Course in Italian Language and Literature.**

For students needing specialized courses not normally or not often included in the regular course offerings. Three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and written consent of the graduate adviser.

### **ITL 390K. Studies in Italian Literature through the Renaissance.**

Intensive study of a particular writer, school, or literary movement. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **ITL 390L. Studies in Italian Literature since the Renaissance.**

Intensive study of a particular writer, school, or literary movement. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **ITL 395L. Comprehensive Examination Preparation.**

Restricted to doctoral students in the Department of French and Italian. Supervised preparation for the comprehensive examination for the doctoral degree. The equivalent of three lecture hours a week. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing; consent of the graduate adviser; and satisfactory completion of all course requirements for the doctoral degree.

### **ITL 396K. Comparative Romance Linguistics.**

General survey of the development of spoken Latin in Italy, Spain, Portugal, and France; main traits of phonology, morphology, and syntax in each modern derivative language. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in languages and consent of instructor and the graduate adviser.

**Topic 1: Introduction to Romance Linguistics.** Same as French 396K (Topic 1: Introduction to Romance Linguistics), Linguistics 383 (Topic 3: Introduction to Romance Linguistics), Portuguese 396K (Topic 2: Introduction to Romance Linguistics), and Spanish 396K (Topic 2: Introduction to Romance Linguistics).

### **ITL 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in Italian and consent of the graduate adviser; for 698B, Italian 698A.

### **ITL 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in Italian and consent of the graduate adviser.

### **ITL 398T. Supervised Teaching in Italian.**

Practical exercises in second-language instruction and closely supervised classroom teaching, supported by theoretical studies of second-language learning. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **ITL 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral program.

### **ITL 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Italian 399R, 699R, or 999R.

## **Geography**

*Master of Arts  
Doctor of Philosophy*

## **For More Information**

**Campus address:** College of Liberal Arts Building (CLA) 3.306, phone (512) 471-5116, fax (512) 471-5049; campus mail code: A3100

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Geography and the Environment, 305 East 23rd Street Stop A3100, Austin TX 78712

**URL:** <http://www.utexas.edu/cola/depts/geography/>

## Facilities for Graduate Work

The teaching and research facilities of the Department of Geography and the Environment are housed in the College of Liberal Arts Building, home to other liberal arts programs and departments. There are also research labs in the adjacent Student Activities Center.

**Environmental Information Systems Laboratory.** This laboratory provides comprehensive resources for learning and research in cartography, geographic information systems (GIS), remote sensing, and spatial statistics. It contains twenty-five microcomputers connected by Ethernet to the campus network and the Internet. The laboratory is also equipped with scanners, digitizers, plotters, GPS receivers, a station for field mapping, and audiovisual equipment for hypermedia production. The computers run a variety of software for microcomputer mapping and GIS, remote sensing, computer-assisted drafting, and statistical analysis.

**Digital Landscape Laboratory.** The Digital Landscape Laboratory is a GIS and remote sensing facility designed to support research in the modeling and characterizing of Earth's varied processes through geomorphology, biogeography, and landscape ecology. The laboratory includes a server, high-speed Ethernet connections, Windows-based workstations, scanners, and a large-format plotter.

**Environmental Analysis Laboratories.** The Soils and Geoarchaeology Laboratory, the Laboratory of Soils and Sediments, the Geosciences Laboratory, and the Environmental Hydrology and Water Quality Laboratory are equipped for field study and laboratory analysis of soils, sediments, pollen, water, fluvial and lake systems, and archaeological materials. Used as research facilities, these laboratories are integral to graduate study in geomorphology, paleoecology, hydrology, biogeography and cultural ecology, morphodynamics, and geoarchaeology. High technology equipment includes a laser granulometer, an X-ray fluorescence analyzer, magnetic susceptibility meters, 210Pb dating by alpha spectroscopy, an Acoustic Doppler Current Profiler (ADCP), a digital echosound coupled to a DGPS system, a dual frequency Stratabox for geophysics surveys, microscopes, samplers, mechanical augers, a vibracorer, spectrophotometers, and other water quality multi-analyzers, among other equipment. Two small boats and two outboard engines are available for research in rivers, lakes, and dams. Additionally, there is a dedicated environmental geoscience classroom for hands-on laboratory learning.

**University Libraries.** The University Libraries are noted for their collections on Latin America, the Middle East, South Asia, and the American West.

Special research, training, and financial aid opportunities are available through area studies centers and research institutes in African and African American studies; Australian studies; East Asian studies; Latin American studies; Middle Eastern studies; Russian, East European, and Eurasian studies; and South Asian studies. Language training is available in Arabic, Bengali, Chinese, Hebrew, Hindi, Japanese, Korean, Malayalam, Persian, Sanskrit, Serbian/Croatian, Tamil, Telugu, Turkish, Urdu, Yoruba, and all major European languages. Additional University research facilities used by graduate students in the Department of Geography and the Environment include the Bureau of Economic Geology, the Center for Energy and Environmental Resources, the Center for Research in Water Resources, the Center for Transportation Research, the Marine Science Institute, the Center for Space Research, and the Population Research Center.

## Areas of Study

The graduate curriculum in geography enables students to obtain an understanding of the heritage and philosophical foundations of the discipline, of contemporary thought and practice in its various subfields,

and of the theories, analytical tools, and techniques currently used in geographic research.

Faculty and graduate students have contributed in many ways to understanding and managing the earth's diverse cultural and physical environments, ranging from local to global scales across the full range of human history. Current clusters of faculty research include *space, place, and social worlds; environmental changes and surface processes; and digital landscapes.*

Faculty associated with the *space, place, and social worlds* cluster investigate how socio-cultural and political-economic processes such as urbanization, agricultural transformation, industrialization, poverty, health care, migration, and mediated communication interact to produce diverse socio-spatial realities across urban, regional, national, and global scales.

Faculty associated with the *environmental changes and surface processes* cluster study biotic, climatic, geomorphic, and anthropogenic factors and processes.

Faculty associated with the *digital landscapes* cluster explore the theoretical and applied issues associated with the acquisition, measurement, representation, analysis, simulation, and visualization of digital geographic information.

The faculty has a strong international orientation and is well prepared to guide students in research in Latin America, South Asia, Southern Africa, and Europe, as well as in the Southwestern and Western regions of the United States. The department encourages interdisciplinary and collaborative work that takes advantage of the University's extensive scholarly resources.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Paul C Adams	Edgardo M Latrubesse
Eugenio Yatsuda Arima	Jennifer A Miller
Sheryl Luzzadder Beach	Francisco L Perez
Timothy Beach	Carlos E Ramos
Karl W Butzer	Bjorn I Sletto
Kelley A Crews	Frederick R Steiner
William Doolittle	Rebecca M Torres
David J Eaton	Peter Ward
Caroline V Faria	Kenneth R Young
Steven D Hoelscher	Leo E Zonn
Gregory W Knapp	

## Degree Requirements

### Master of Arts

To obtain a master's degree in geography, students must complete either thirty semester hours of coursework, including eighteen hours of geography, six hours in a minor subject, and six hours in the thesis course; or thirty-six semester hours of coursework, including twenty-seven hours of geography, six hours in a minor subject, and three hours in the report course. A student who wishes to substitute courses in another field for geography courses must demonstrate that these substitutions are appropriate to his or her program of study and must have the consent of the graduate adviser and the supervising professor for the courses substituted. First-year master's degree students must complete Geography 390K in the fall semester and Geography 390L in the spring semester, with a grade of at least *B-* in each course. All students must also demonstrate proficiency in a foreign language or in a quantitative or

qualitative method. The student's supervising committee and the graduate adviser oversee fulfillment of this requirement.

Each student must also enroll in at least one organized course in geography during both the first and the second semester in the graduate program. These courses must be taught by different full-time faculty members within the department, as approved by the graduate adviser. Geography 390K, 390L, 397, and 398T may not be counted toward this requirement. Geography 397, *Conference Course in Geography*, may be counted only once toward the degree. By the middle of the second semester, the student should have chosen a supervising committee.

When all course requirements and the language or methods requirement have been fulfilled, the student completes the degree by presenting independent research in the form of a thesis or report.

## Doctor of Philosophy

All students entering the doctoral program must hold a Master of Arts degree or the equivalent.

To qualify for advancement to candidacy, a student must do the following:

1. Complete, with a grade of at least *B-*, two required seminars, Geography 390K and 390L, in the first year of study. All doctoral students must also take two courses taught by different full-time faculty members within the department, as approved by the graduate adviser. Geography 390K, 390L, 397, and 398T may not be counted toward this requirement. Doctoral students may repeat Geography 397, *Conference Course in Geography*, but this course may be counted only twice toward the degree.
2. Fulfill the language requirement by demonstrating proficiency in one language other than English. Non-native English speakers may fulfill the requirement by demonstrating proficiency in English. Proficiency must be approved by the student's dissertation supervisor and the graduate adviser. In exceptional cases, the requirement may be waived with the approval of the graduate adviser.
3. Fulfill the methods requirement by demonstrating proficiency in either a quantitative or a qualitative method, as approved by the student's dissertation supervisor and the graduate adviser.
4. Select a faculty supervisor and dissertation committee by the end of the second semester; the student may later change supervisors and alter the committee if appropriate.
5. Present a Program of Work that meets the approval of the dissertation supervisor.
6. Demonstrate comprehensive knowledge in two areas of specialization in geography.
7. Pass a qualifying examination.

After admission to candidacy, a student has completed the formal program of coursework and engages in the research and writing of the dissertation, culminating in an oral defense of the dissertation.

## Dual Degree Program

The Department of Geography and the Environment offers the following dual degree program in cooperation with another division of the University. More information is available from the graduate adviser in each program.

Field(s) of Study	Degree(s)
Community and regional planning	Master of Science

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Geography: GRG

#### GRG 380. Field Course in Geography.

Collection of data, formulation of meaningful categories of regions, development of hypotheses of cause-and-effect relations through direct contact with the phenomena and processes in the area where a problem is located. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### GRG 380C. Myth, Ritual, Place, and Environment.

Impact of local religious lore and practice on cultural landscapes, conservation, and sense of place; cultural and environmental consequences of the spatial expansion of world religions; other themes in the geography of religion, including civil religion and environmental theology. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### GRG 380D. Environment and Health in Latin America.

Same as Latin American Studies 388 (Topic 4: Environment and Health in Latin America). Issues related to health, health care, and development in Latin America and the Caribbean, considered with the recognition that health depends on the interactions of social, economic, and political factors as well as on health care services. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### GRG 380E. Geomorphology of the Southwest.

Geography of West Texas and New Mexico; late Cenozoic basalt flows, volcanic ashes, sand sheets, alluvium, paleolake deposits, glacial moraines, colluvium, and soils; integration of landforms and landscape ecology. Includes a ten-day field trip. The equivalent of three lecture hours a week for one semester, with additional field hours to be arranged. Prerequisite: Graduate standing and consent of instructor.

#### GRG 380F. Field Techniques in Sediments and Soils.

Designed to provide experience in field description of sediments and soils in Central Texas; second half of course focuses on field interpretation of geomorphology and landscape evolution using sedimentary deposits and soils. The equivalent of three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### GRG 381. Seminar in Historical Geography.

Topics include Latin America, Anglo-America, Texas, boundaries, settlement origins and patterns, origins of agriculture. The equivalent of three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in geography or a related social science, and consent of instructor.

#### GRG 381C. Mapping the Middle East.

Same as Middle Eastern Studies 381 (Topic 31: Mapping the Middle East). Ways in which the Middle East is and has been represented cartographically. Cartographic representations of the region during the fifteenth and sixteenth centuries; the nature and evolution of a distinctive Islamic cartographic tradition; the role and use of maps during the nineteenth and twentieth centuries both in the extension of colonialism and in the creation of modern states; and the contemporary



use, applications, and implications of geographic information systems in organizing and representing data spatially. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **GRG 382K. Geo-Archaeology and Environmental History.**

Same as Anthropology 382N. Long-term ecology as reconstructed from settlement and land-use histories. Empirical case studies in environmental history from the Mediterranean region, the Near East, and Mesoamerica. Applications to degradation, desertification, sustainability, and global change. Three lecture hours a week for one semester. Only one of the following may be counted: Anthropology 382N, Geography 356C, 382K. Prerequisite: Graduate standing.

### **GRG 383C. Seminar in Environment and Development.**

A third- and fourth-world perspective on the geographic implications of international development; emphasis on local and global environmental effects. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in geography or a related social science.

#### **Topic 2: Environment and Development in the Middle East.**

Same as Middle Eastern Studies 381 (Topic 29: Environment and Development in the Middle East).

### **GRG 384C. Watershed Systems and Environmental Management.**

The effect of landcover change on drainage basin processes, considered from a geomorphological perspective over varying temporal and spatial scales. Topics may include watershed management, stream channel restoration, fluvial geomorphic processes, and Geographic Information Systems applications to drainage basin processes. Three lecture hours a week for one semester, with additional field hours to be arranged. Prerequisite: Graduate standing and consent of instructor.

### **GRG 385. Seminar in Regional Geography.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; consent of instructor.

**Topic 1: Regional Geography of Latin America.** Same as Latin American Studies 388 (Topic 1: Regional Geography of Latin America). Topics include land and life in Central America; culture, environment, and development in Latin America; recent trends in Latin American geography.

**Topic 2: Europe.** Topics include various aspects of the economic and political geography of individual nations or regions, such as regional differences in Southeast Europe, agricultural developments in European Community countries, trade, viability of individual countries, the changing resources picture in Western and Eastern Europe.

**Topic 3: Anglo-America.** Topics include agricultural patterns of the United States, comparative regional studies, measurement and delimitation of regions, analysis of population shifts.

**Topic 4: Asia.** Topics include economic regionalization in Asia, spatial structure of Asian manufacturing, regional discrimination analysis for selected areas and variables in Asia, urban structure in South Asia, developmental activity and spatial change in India.

**Topic 5: Regional Geography of the Middle East and North Africa.** Same as Middle Eastern Studies 381 (Topic 11: Regional Geography of the Middle East and North Africa). Topics include developmental activity and spatial change in the Middle East, comparative regional studies.

### **GRG 385C. Quaternary Landscapes.**

Changing physical and biotic landscapes on Ice Age earth during the past two million years. Reconstruction of Quaternary geomorphic landscapes based on principles and applications of geochronology

and paleoclimatology. Three lecture hours a week for one semester. Geography 335C and 385C may not both be counted. Prerequisite: Graduate standing.

### **GRG 386C. Seminar in Quaternary Studies.**

Issues and new developments in regional and global aspects of Quaternary climates, biota, prehistory, and landscape evolution. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **GRG 387C. Political Ecology.**

An introduction to the history of development theory, economic globalization, studies in the history of science, issues of social justice, and critical studies of environmental history. Three lecture hours a week for one semester. Geography 387C and 396T (Topic: Political Ecology) may not both be counted. Prerequisite: Graduate standing.

### **GRG 387D. Globalization, Conflict, and Resistance.**

Focuses on a theoretical and empirical understanding of the economic, cultural, political, and policy dimensions of globalization; study of the impact of globalization on people and places; understanding of class and identity conflicts using case studies from Latin America, the United States, Europe, Africa, the Middle East, and Asia; and exploration of theories of social movement with examples from the global North and South. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **GRG 388. Seminar in Resources and Conservation.**

Development of the conservation movement, problems of resource misuse, conservation practices, state and national conservation policies, nature and distribution of natural resources. Three lecture hours a week for one semester. Prerequisite: Graduate standing in geography or a related social science, and consent of instructor.

### **GRG 388C. Indigenous Maps, Architecture, and Enculturation of Colonial Mexico.**

Same as Latin American Studies 388 (Topic 2: Indigenous Maps, Architecture, and Enculturation of Colonial Mexico). The encounter of Spanish and indigenous cultures and ecologies; regional diversity of agricultural, urban, and economic development from 1521 to 1810; ethnic transformation and new socioeconomic configurations. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **GRG 390. Cultural and Humanistic Geography.**

Analysis of human-environment interactions by employing the concepts of place, home, and dwelling. Discussion of humanistic and postmodern geographical research. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **GRG 390C. Landscape, Meaning, and Society.**

The creation, transformation, and meaning of landscapes within different societies through time. Iconographical analysis of the built environment; impress of belief and ideology on landscape; analysis of nationalistic and authoritarian landscapes; problems of defining and mapping ethnicity; civilizational process and behavior; institutional vandalism, place annihilation, and the destruction and effacement of landscape symbols; cultural and geographical foundations and unintended consequences of global economic integration. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **GRG 390K. Issues in Geography.**

Examines the history, philosophy, and ontology of geography, including its various subfields. Three lecture hours a week for one semester. Required of all first-year graduate students in geography. Prerequisite: Graduate

standing in geography, or graduate standing and consent of the graduate adviser.

### **GRG 390L. Research in Geography.**

Builds on topics explored in Geography 390K by focusing on epistemology and research in the field of geography. Students develop plans for research and write a research proposal. Three lecture hours a week for one semester. Required of all first-year graduate students in geography. Prerequisite: Graduate standing and Geography 390K.

### **GRG 390S. Environment, Development, and Food Production.**

Assessment of various types of nonmechanized agriculture with regard to environmental factors and management techniques. Three lecture hours a week for one semester. Geography 339K and 390S may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **GRG 391C. Dynamics of Earth Systems.**

An overview of climate, vegetation, soil, and landform processes. Principles and methodology of physical geography. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **GRG 391M. Multivariate Techniques in Spatial Analysis.**

The application of multivariate data analytic techniques including regression, factor, canonical, and discriminatory analysis of spatial problems. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Geography 360L or a basic course in inferential statistics.

### **GRG 192D. Grant Writing in Geography.**

Designed to train students to write competitive and successful applications for extramural grants and fellowships. One lecture hour a week for one semester. Prerequisite: Graduate standing.

### **GRG 392M. Seminar in Biodiversity Conservation.**

Examines issues that involve the conservation and sustainable use of plants, animals, and ecosystems. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **GRG 393C. Seminar in Digital Landscapes.**

Explores the theoretical and applied issues associated with the acquisition, analysis, simulation, and visualization of digital geographic information, with an emphasis on current trends in landscape characterization, landscape ecology, biodiversity, global change, environmental remote sensing, and socio-ecological systems. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **GRG 393D. Geographical Information Systems and Ecological Modeling.**

Covers the steps involved in conceptualizing and formulating predictive models in a raster geographical information systems environment. Although many of the topics covered are fairly generic and can be applied to any application area in which raster data are used, species distribution models will be used as the example application area. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **GRG 493K. Research in Remote Sensing of the Environment.**

Imagery generated by remote sensors applied to research and problem solving in the physical and cultural environment. Three lecture hours and two laboratory hours a week for one semester. Prerequisite: Graduate standing.

### **GRG 493M. Advanced Remote Sensing and Quantitative Landscape Ecology.**

Advanced digital image processing of optical satellite imagery for landscape composition and pattern analysis. Three lecture hours and one and one-half discussion hours a week for one semester. Prerequisite: Graduate standing, and Geography 493K or the equivalent or consent of instructor.

### **GRG 394. Seminar in Urban Analysis.**

Research seminar in urban issues: demographic, environmental, and transportation modeling; metropolitan finance; and urban social pathologies. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **GRG 394C. Market Area Analysis.**

Same as Marketing 382 (Topic 1: Market Area Analysis). Conceptual and methodological aspects of analyzing the geographical dimensions of demand. Students complete a field project in which they apply concepts and techniques to the analysis of a problem. Offered on the letter-grade basis only.

### **GRG 394K. Geographic Information Systems.**

An introduction to the design and use of geographic information systems and to computer-based tools used to store, manage, analyze, and display spatially referenced data. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **GRG 394L. Advanced Applications of Information Technology.**

Advanced issues in computer cartography, geographic information systems, three-dimensional environmental reconstruction and rendering, terrain modeling, animation of environmental processes, and hypertext and multimedia authoring. Interdisciplinary subjects, such as the application of geographic information systems to archaeological research, historical demography, and habitat mapping and analysis. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **GRG 395. Cultural Adaptation and Change.**

Same as Anthropology 395K. A graduate-level introduction to cultural behavior, adaptation, evolution and transformation, with emphasis on demography, diffusion, migration, ethnicity, and institutions. Three lecture hours a week for one semester. Prerequisite: Graduate standing in anthropology, geography, or a related field, and consent of instructor.

### **GRG 395D. Latin American Cultures, Environment, and Development.**

Same as Latin American Studies 388 (Topic 3: Latin American Cultures, Environment, and Development). Exploration through Latin American examples of issues of cultural identity and territory, adaptive strategies, environmental impact, conservation, cultural survival, parks and people, and sustainable development. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **GRG 396. Techniques in Pollen Analysis.**

Field sampling, laboratory processing, microscopy, pollen grain morphology, pollen counting, and data-handling techniques. Two lecture hours and four laboratory hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **GRG 396C. Seminar in Current Geographic Research.**

Review and discussion of recent research projects across the field of geography; includes analysis of theories and methodologies, and various methods for presenting results. Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite:

Graduate standing in geography or a related field, and consent of instructor.

### **GRG 396K. Quaternary Palynology.**

Methods, principles, and applications of pollen analysis to vegetational, paleoenvironmental, and ethnobotanical reconstructions. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **GRG 396T. Topics in Geography.**

Three lecture hours a week for one semester. Some topics may require additional field trips. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

### **GRG 397. Conference Course in Geography.**

Supervised study and research. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of supervising professor.

### **GRG 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in geography and consent of the graduate adviser; for 698B, Geography 698A.

### **GRG 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in geography and consent of the graduate adviser.

### **GRG 398T. Supervised Teaching in Geography.**

Teaching under the close supervision of the course instructor; group meetings with the instructor, individual consultations, and reports throughout the teaching period. Three lecture hours a week for one semester. Prerequisite: Graduate standing and appointment as a teaching assistant.

### **GRG 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and consent of the graduate adviser.

### **GRG 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Geography 399R, 699R, or 999R.

## **Germanic Studies**

*Master of Arts  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Burdine Hall (BUR) 336, phone (512) 471-4123, fax (512) 471-4025; campus mail code: C3300

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Germanic Studies, 2505 University Avenue Stop C3300, Austin TX 78712

**E-mail:** [chair@gmc.utexas.edu](mailto:chair@gmc.utexas.edu)

**URL:** <http://www.utexas.edu/cola/depts/germanic/>

## **Facilities for Graduate Work**

The Department of Germanic Studies is committed to scholarship and teaching that foster the highest professional achievement and standards. The faculty focuses on interdisciplinary and intercultural research on primary sources in cultural studies, linguistics, literature, and second language studies, as well as on course development and teaching. The program of study combines work that emphasizes traditional scholarly tools and approaches to literature, language, and cultures with twenty-first century research on emerging forms of textuality and media, cultural identity, migration and exile, cultural contact situations, Web-based and media-based research and teaching, and other theoretical and computer-based approaches to cultural studies and cultural history.

The department encourages programs of study that combine German and other Germanic cultures, especially Danish, Dutch, Norwegian, and Swedish; it welcomes work that makes substantial links between cultural sites in different periods and different regions, as well as between different scholarly disciplines and research paradigms. Course offerings of the resident faculty are supplemented by visiting scholars from Europe, including long-term DAAD lecturers, and occasional writers or scholars in residence. While completing core requirements within the department, students are encouraged to pursue links to and coursework in other programs in the University.

The University Libraries are state-of-the-art. They are among the ten largest collections in the country and focus especially on digital collections. The Harry Ransom Center, the campus rare books library, has substantial holdings in German drama, manuscripts, and publisher's correspondence; and the Blanton Museum of Art has one of the largest collections of prints, drawings, and paintings in the country, including significant holdings in European graphic arts.

## **Areas of Study**

All students in the graduate program take a core of required courses. In consultation with the graduate adviser, each student chooses a concentration to aid in the choice of electives. Concentrations may include courses from outside the department that are related to the major area of study.

## **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Katherine M Arens	Peter Hess
Martin Baeumel	John M Hoberman
Kirsten L Belgum	Marc Pierce
Hans C Boas	Peter Rehberg
Pascale R Bos	Sandra B Straubhaar
Corinne Petra Crane	Jurgen K Streeck
Kirkland A Fulk	Per K Urlaub
Sabine Hake	Lynn R Wilkinson

## **Admission Requirements**

Entering graduate students must have a bachelor's degree (or the equivalent from a university outside the United States), ordinarily with a major in German or the appropriate Germanic language.

# Degree Requirements

## Master of Arts

Students enroll in a core program to fulfill the requirements for the master's degree. The core program consists of four courses: German 381, 382M or 382N, 386, and 398T, as well as six electives.

The master's degree program requires thirty-three semester hours of coursework, of which three hours are earned in the report course, German 398R. Students must pass an oral examination of up to one and one-half hours based on the master's report and coursework done in the declared area of the specialization. Students must also demonstrate reading competence in one foreign language other than English and the language of the students' major field of study (usually German); students with competence in English and another Germanic language are strongly encouraged to choose German as their other language.

## Doctor of Philosophy

The doctoral program usually requires twenty-seven semester hours of coursework beyond the master's degree. In consultation with the graduate adviser, students develop primary and supporting areas of specialization, with the primary area usually being the area of the proposed dissertation. These areas should represent professionally acknowledged focuses for research and teaching in the field, covering the broad spectrum of literature, cultural, and linguistic specializations represented in the major professional organizations. Students choose coursework from these areas and plan for the qualifying procedure. Students are expected to complete the core program for the Master of Arts degree or its equivalent before admission to the doctoral program. Students must fulfill the following requirements: (1) successfully complete the qualifying procedure administered by the Graduate Studies Committee to enter the doctoral program; (2) demonstrate reading competence in one foreign language other than German or the language of concentration; (3) near the completion of all coursework, pass the candidacy procedure; and (4) defend the dissertation in the final oral examination.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### German: GER

#### GER 381. Studies in Germanic Linguistics and Philology.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing or consent of instructor.

**Topic 2: Introduction to Synchronic Linguistics: German.**

**Topic 3: Introduction to Diachronic Linguistics: Germanic.** Same as Classical Civilization 383 (Topic 2) and Linguistics 383 (Topic 8). Only one of the following may be counted: Anthropology 393 (Topic 16), Classical Civilizations 383 (Topic 2), German 381 (Topic 3), Linguistics 383 (Topic 8).

**Topic 14: Introduction to the Sociolinguistics of German.**

#### GER 382M. Topics in Cultural History.

Study of various political, intellectual, artistic, and social movements in the cultures of Germanic countries. Three lecture hours a week for one

semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing or consent of instructor.

#### GER 382N. Topics in Intellectual History.

An interdisciplinary investigation of the significance of ideological structures of thought in historical contexts. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing or consent of instructor.

#### GER 185, 285, 385. Conference Course in Germanic Languages or Literature.

Conference course. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

#### GER 386. Periods in Germanic Literature.

Thorough survey of the principal periods of Germanic literature. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing or consent of instructor.

**Topic 1: German Literature and Culture: Middle Ages through Humanism (800-1450).**

**Topic 2: German Literature and Culture: Renaissance/Reformation through Baroque (1450-1730).**

**Topic 3: German Literature and Culture: Enlightenment through Realism (1730-1890).**

**Topic 4: German Literature and Culture: Naturalism since 1890.**

**Topic 5: Old Norse Literature and Culture.**

**Topic 10: Dutch Literature and Culture.**

**Topic 12: Scandinavian Literature and Culture.**

#### GER 389K. Methods in the Study of Literature and Linguistics.

An introduction to the critical and technical procedures used in Germanic studies, especially bibliographical aids. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing or consent of instructor.

**Topic 1: Fundamentals of Scholarship.**

**Topic 6: German Rhetoric and Stylistics.**

#### GER 392. Seminar in Germanic Literature and Culture.

Study of problems, topics, writers, genres, and movements in Germanic literature and culture. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing or consent of instructor.

**Topic 1: German Literature and Cinema.** Offered on the credit/no credit basis only.

#### GER 393K. Seminar in Germanic Linguistics and Philology.

Study of linguistic topics in Germanic languages, such as grammar, morphology, phonology, dialectology, syntax, lexicology, sociolinguistics. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing or consent of instructor.

**Topic 1: German Syntax.**

**Topic 3: The Acquisition of German.** Special problems in the acquisition of German or another Germanic language as a first or second language. German 381 (Topic: The Acquisition of German) and 393K (Topic 3) may not both be counted.

**Topic 4: Synchronic Linguistics: German Morphology.**

**Topic 6: Sociolinguistics: Language Contact and Death.**

**Topic 7: Sociolinguistics: Texas German Dialect.**

**Topic 8: Sociolinguistics: German Dialectology.**

**Topic 9: Synchronic Linguistics: Phonetics and Phonology.**

- Topic 10: Older Germanic Languages and Cultures: Old Norse.**  
**Topic 11: Older Germanic Languages and Cultures: Gothic.**  
**Topic 12: Older Germanic Languages and Cultures: Old High German.**  
**Topic 13: Older Germanic Languages and Cultures: Middle High German.**  
**Topic 14: Older Germanic Languages and Cultures: Old Saxon.**

URL: <http://www.utexas.edu/cola/depts/government/>

## Facilities for Graduate Work

With more than sixty full-time or jointly appointed members, the Department of Government is one of the largest political science faculties in the country. The department houses important research centers, including the Public Policy Institute and the Policy Agendas Project, and its faculty are affiliated with a variety of global research initiatives, like the Comparative Constitutions Project and the AidData Research Consortium. The department's research resources include excellent computer facilities and an extensive collection of machine-readable social science data.

Students in the department also take advantage of many of the University's research facilities and programs, including the Teresa Lozano Long Institute of Latin American Studies and Centers for East Asian Studies; Russian, East European, and Eurasian Studies; and Middle Eastern Studies. Many other units provide institutional support for political scientists, including the Brazil Center, the Edward A. Clark Center for Australian and New Zealand Studies, the Center for European Studies, the John L. Warfield Center for African and African American Studies, and the South Asia Institute.

The University has one of the largest academic libraries in the United States, with many collections of value for research in government and politics; these include the Benson Latin American Collection, the Grattan collection on Australia, the Woodrow Wilson collection, the Tobenkin collection on the Russian Revolution, the Jaffe collection on political radicalism, and a variety of special materials on southern and western Americana, Southwestern history and politics, India, East Asia, the Middle East, Africa, and the British Commonwealth. The library system also includes the Dolph Briscoe Center for American History, the Harry Ransom Center, and the Tarlton Law Library. The campus is the site of the Lyndon Baines Johnson Library and Museum, an invaluable resource for the study of twentieth-century politics.

## Areas of Study

All candidates for graduate degrees are expected to develop a broad competence in the discipline as a whole as well as expertise in specific areas. The program offers specialized instruction in the following fields: American politics, comparative politics, international relations, methodology, political theory, public law, and public policy.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

### GER 394C. Topics in Comparative, Cultural, or Theoretical Studies.

Topics with a substantial Germanic component or application that fall outside of national-language literary and linguistic studies. May include comparative national approaches to genre, culture, or society; interdisciplinary studies; and surveys or focused studies on approaches to theory or methodology that apply to Germanic studies. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing or consent of instructor.

### GER 397P. Topics in Applied Linguistics and Pedagogy.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing or consent of instructor.

### GER 698. Thesis.

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in Germanic studies and consent of the graduate adviser; for 698B, German 698A.

### GER 398R. Master's Report.

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in Germanic studies and consent of the graduate adviser.

### GER 398T. Supervised Teaching in German.

Analysis of the major foreign language teaching methodologies; curriculum and curricular materials development. Three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing.

### GER 399R, 699R, 999R. Dissertation.

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### GER 399W, 699W, 999W. Dissertation.

Offered on the credit/no credit basis only. Prerequisite: German 399R, 699R, or 999R.

## Government

*Master of Arts  
 Doctor of Philosophy*

## For More Information

**Campus address:** Batts Hall (BAT) 2.116, phone (512) 471-5121, fax (512) 471-1061; campus mail code: A1800

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Government, 158 West 21st Street A1800, Austin TX 78712

**E-mail:** [gov-gpo@austin.utexas.edu](mailto:gov-gpo@austin.utexas.edu)

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 Bethany L Albertson  
 Zoltan D Barany  
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 Jason M Brownlee  
 Bruce Buchanan II  
 J Budziszewski  
 Terrence L Chapman  
 Henry A Dietz  
 David V Edwards  
 Zachary S Elkins  
 James M Enelow  
 Michael G Findley  
 Gary P Freeman  
 James K Galbraith  
 Terri E Givens  
 Kenneth F Greene  
 Benjamin G Gregg  
 Roderick P Hart  
 Juliet A Hooker  
 Wendy A Hunter  
 Gary J Jacobsohn  
 Stephen A Jessee  
 Bryan D Jones  
 David L Leal  
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 H W Perry Jr  
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 Victoria E Rodriguez  
 Thomas K Seung  
 Daron R Shaw  
 Bartholomew H Sparrow  
 David B Spence  
 Devin A Stauffer  
 Sean M Theriault  
 Jeffrey K Tulis  
 Maurizio Viroli  
 Rachel Wellhausen  
 Timothy Daniel Werner  
 Kurt G Weyland  
 Christopher Wlezien  
 Michael Scott Wolford

## Government: GOV

### GOV 380R. Mathematical Methods for Political Analysis.

An introduction to mathematical concepts essential for quantitative analysis, such as statistics and formal political theory. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### GOV 381J. Political Institutions and Processes.

Local, state, and national political institutions and policy processes, and specific areas of public policy. Field core course. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### GOV 381L. Seminar in American Government and Politics.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, twenty-four semester hours of coursework in government or related fields, and consent of the graduate adviser.

**Topic 1: Parties and Interest Groups.** An empirically oriented inquiry into political parties and interest groups in the political process.

**Topic 2: The Legislative Process.** Legislative functions, processes, and behavior, with special reference to representative assemblies in the United States.

**Topic 4: State Government and Politics.** Institutions, processes, and problems of the American political system at the state level.

**Topic 5: Government and the Economy.** Selected topics on the interrelations between governments and economic systems, with particular reference to American experience.

**Topic 6: Ethnic Politics.** An examination of the status and behavior of racial, ethnic, and religious minorities in the American political system.

**Topic 7: The American Presidency.**

**Topic 8: Congress.**

**Topic 9: Campaigns and Elections.**

**Topic 10: American Political Development.**

**Topic 11: Evolution of American Politics.**

**Topic 12: Positive Political Economy.**

### GOV 381R. Political Behavior.

Political socialization, political psychology, public opinion, and electoral behavior. Field core course. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### GOV 381S. Seminar in Political Behavior.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

**Topic 1: Public Opinion and Voting Behavior.**

**Topic 2: Political Participation.**

### GOV 382K. Studies in Political Theory and Philosophy.

Intensive study of selected classical and contemporary theorists and source materials related to political theory and philosophy. Field core course. Three lecture hours a week for one semester. Prerequisite: Graduate standing, twenty-four semester hours of coursework in government or related fields, and consent of the graduate adviser.

### GOV 382M. Seminar in Political Theory and Philosophy.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, twenty-four semester hours of coursework in government or related fields, and consent of the graduate adviser.

## Degree Requirements

### Master of Arts

The master's degree program requires either twenty-four semester hours of coursework and Government 698, the thesis course; or thirty hours of coursework and Government 398R, the report course. At least six hours must be taken as supporting work outside the department.

### Doctor of Philosophy

A doctoral degree candidate must fulfill the following general requirements: (1) complete foundation courses in political science and more specialized coursework in two fields of study; (2) demonstrate language proficiency or competence in quantitative research methods; (3) pass written examinations in two fields; (4) prepare and defend a dissertation proposal; and (5) write an original dissertation and successfully defend it in oral examination. Additional information on specific requirements and procedures is available from the department.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

**Topic 1: Contemporary Political Theory.** Analysis of contemporary theoretical problems and detailed study of the works of contemporary Western theorists.

**Topic 2: American Political Thought.** Examination of the origins and development of political ideas that have influenced the evolution of the American political system.

**Topic 4: Feminist Theory.**

**Topic 5: Natural Law Modernized.**

**Topic 6: Postmodernism.**

**Topic 7: Classical Liberalism, Utilitarianism, and Democratic Theory.**

**Topic 8: Philosophy of History.**

**Topic 9: Rousseau.**

### **GOV 383K. Problems in the Study of Politics.**

Normative orientations in research, theory formation and empirical assessment, various conceptions of explanation, and historical development of the social sciences. Three lecture hours a week for one semester. Prerequisite: Graduate standing, twenty-four semester hours of coursework in government or related fields, and consent of the graduate adviser.

### **GOV 384L. Seminar: Latin American Politics.**

Analysis of selected problems in politics and international relations of the countries of Latin America. Two class hours and one conference hour a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, twenty-four semester hours of coursework in government or related fields, and consent of the graduate adviser. Some reading knowledge of Spanish or Portuguese is recommended.

**Topic 1: Brazilian Public Policies.** Same as Latin American Studies 384L (Topic 1: Brazilian Public Policies). Three lecture hours a week for one semester.

**Topic 2: Latin American Urban Politics.** Same as Latin American Studies 384L (Topic 2: Latin American Urban Politics). Three lecture hours a week for one semester.

### **GOV 384M. Seminar in Public Policy and Administration.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, twenty-four semester hours of coursework in government or related fields, and consent of the graduate adviser.

**Topic 1: Policy Evaluation.** Quantitative assessment and analysis of the impact and consequences of public policies.

**Topic 2: Policy Analysis.** Same as Latin American Studies 384L (Topic 4: Policy Analysis). Study of the nature and operation of the national policymaking process.

**Topic 3: Organizational Theory.** Analysis of the structure and operation of complex public bureaucracies.

**Topic 4: Comparative Administration.** Study of administrative theory and practice in comparative perspective.

**Topic 5: Public Management.** Analysis of the executive function in the public sector.

**Topic 6: Development Policy.** Same as Latin American Studies 384L (Topic 3: Development Policy).

**Topic 7: Comparative Public Policy.**

**Topic 8: Public Policy Clinic.** Offered on the credit/no credit basis only.

### **GOV 384N. Seminar in Public Law.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, twenty-

four semester hours of coursework in government or related fields, and consent of the graduate adviser.

**Topic 1: The Judicial Process.** An exploration of the nature of the judicial function, with emphasis on the roles of law and discretion in the decisional process.

**Topic 2: Core Readings in Public Law.**

**Topic 3: Constitutional Interpretation.**

**Topic 4: State Constitutions and Human Rights.**

### **GOV 385K. Foundations of Public Policy.**

Introduction to major institutions, values, processes, and problems that shape contemporary public policies. Review and appraisal of current international, national, state, and local policy debates. Sampling of theoretical literature in policy analysis, American politics, institutional and organizational theory, macroeconomic management, democratic theory, policy evaluation, and politics-governance conflicts. Field core course. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### **GOV 385L. Seminar in Methodology.**

Intensive examination of selected issues in the methodology of political inquiry. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

**Topic 1: Time-Series Analysis.**

**Topic 2: Introduction to Political Methodology.**

**Topic 3: Simultaneous Equation Models.**

**Topic 4: Advanced Regression.**

### **GOV 185M. Colloquium in Politics.**

Field roundtables, reports of current research, and panel discussions of significant issues in the study of politics. One lecture hour a week for one semester. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### **GOV 385N. Introduction to Formal Political Analysis.**

Critical, comparative survey of important formal theories of political processes, stressing general approaches rather than mathematical results. Presupposes no technical background. Field core course. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### **GOV 385R. Seminar in Formal Theory.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

**Topic 1: Game Theory.**

**Topic 2: Spatial Theory.** Only one of the following may be counted: Government 381L (Topic: Spatial Theory), 385L (Topic: Spatial Theory), 385R (Topic 2).

### **GOV 386J. Social Science Research for Political Professionals.**

Restricted to students in the option III master's program in applied politics. A survey of research methods focused on applications for policy, legislative, and advocacy purposes. Covers quantitative and qualitative methods including basic statistical analysis as well as legal and public source research. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **GOV 386L. Survey Methods for Campaigns and Advocacy.**

Restricted to students in the option III master's program in applied politics. An introduction to the use of statistical methods in political practice, including an overview of statistical concepts; special attention is paid to survey design, analysis, and use of common statistical applications. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **GOV 388K. The Study of International Relations.**

Comparison of various theories of international politics and analysis of basic forces that underlie national policies and condition the nature and concerns of contemporary international relations. Discussion, reading, and research. Field core course. Three lecture hours a week for one semester. Prerequisite: Graduate standing, twenty-four semester hours of coursework in government or related fields, and consent of the graduate adviser.

### **GOV 388L. Seminar in International Relations.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, twenty-four semester hours of coursework in government or related fields, and consent of the graduate adviser.

**Topic 1: Study of International Conflict.** Studies of the determinants of foreign policy in selected countries, with consideration of both domestic and international factors.

**Topic 2: American Foreign Policy.** Topics in the study of American foreign policy, including the problems and instruments of American diplomacy, and the process by which policy is made.

**Topic 3: International Security.** Study of the political determinants and the substantive issues of national security policy with particular emphasis upon the United States.

**Topic 4: Contemporary Issues in International Relations.** An analysis of major current developments and issues in international politics and military relations.

**Topic 5: International Law and Organization.** An analysis of the forms and functions of international law and organization, with particular emphasis on the case method as means of adjusting interstate relations.

**Topic 6: International Political Economy.**

**Topic 7: Theory and International Relations.**

**Topic 8: Competing Approaches to World Politics.**

### **GOV 390K. Comparative Study of Political Systems.**

Theory and method of comparative political study; varieties of governmental institutions in Western and non-Western countries; comparative examination of political institutions. Field core course. Three lecture hours a week for one semester. Prerequisite: Graduate standing, twenty-four semester hours of coursework in government or related fields, and consent of the graduate adviser.

### **GOV 390L. Seminar in Comparative Government and Politics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, twenty-four semester hours of coursework in government or related fields, and consent of the graduate adviser.

**Topic 2: Political Systems of Western Europe.** Analysis of Western European politics; may include both particular political systems and comparative study of political institutions, processes, and behavior.

**Topic 4: Politics of the Middle East and North Africa.** Same as Middle Eastern Studies 381 (Topic 22: Politics of the Middle East and North Africa). Readings and research on the political systems of the Arab world, Israel, Turkey, Iran, and Afghanistan. Precise topics vary.

**Topic 7: Authoritarian Political Systems.** Same as Asian Studies 390 (Topic 2: Authoritarian Political Systems). Comparative study of authoritarian and totalitarian patterns of government, past and present, Western and non-Western; special emphasis on Communist and Fascist systems.

**Topic 9: Political Sociology.**

**Topic 10: Elites.** Same as Sociology 396P (Topic 6: Elites). May be counted toward the political sociology specialization in the sociology degree program.

**Topic 11: Seminar in Russian, East European, and Eurasian Civilizations and Cultures.**

**Topic 12: Soldiers and Politics.**

**Topic 13: Political Transition in Eastern Europe.**

**Topic 14: Comparative Political Institutions.**

**Topic 15: Politics and Society in the Third World.** Same as Latin American Studies 384L (Topic 5: Politics and Society in the Third World).

**Topic 16: Politics of Mexico.**

**Topic 17: Ethnicity, Religion, and Politics in South Asia.** Same as Asian Studies 384 (Topic 3: Ethnicity, Religion, and Politics in South Asia).

**Topic 18: Comparative Politics: Latin America.** Same as Latin American Studies 384L (Topic 6: Comparative Politics: Latin America).

**Topic 19: Advanced Readings in Chinese Politics.** Same as Asian Studies 381 (Topic 1: Advanced Readings in Chinese Politics).

**Topic 20: Japanese Politics.** Same as Asian Studies 383 (Topic 4: Japanese Politics).

**Topic 21: Comparative Ethnic Conflict.** Same as Asian Studies 391 (Topic 1: Comparative Ethnic Conflict).

### **GOV 391J. Statistical Analysis in Political Science I.**

An introductory course covering estimation theory and hypothesis testing for statistical models in political science and the basic probability theory needed for statistical theory. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### **GOV 391K. Seminar in Political Science.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, twenty-four semester hours of coursework in government or related fields, and consent of the graduate adviser.

**Topic 7: Scope and Methods of Political Science.** History, scope, and methods of political science as a discipline; major paradigms and current subfields; conceptions of explanation in the social sciences; concept formation, theory construction, and empirical assessment; problems of interpretation, comparison, measurement, and experimentation; designs for research; normative orientations in research.

### **GOV 391L. Statistical Analysis in Political Science II.**

Multivariate statistical techniques and their applications to problems in political science. Field core course. Three lecture hours a week for one semester. Prerequisite: Graduate standing, one course in statistics, and consent of the graduate adviser.

### **GOV 391R. Research Colloquium in Political Science.**

Forum for development of research projects and dissertation proposals. Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.



### **GOV 397K, 697K. Conference Course in Political Science.**

Readings in the literature of political science in fields in which the student is preparing for the qualifying examinations for the Doctor of Philosophy. May be repeated for credit. Prerequisite: Graduate standing, twenty-four semester hours of coursework in government or related fields, and consent of the graduate adviser.

### **GOV 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in government, twelve semester hours of upper-division or graduate coursework in government, six of which must be in the field of the thesis subject, and consent of the graduate adviser; for 698B, Government 698A.

### **GOV 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in government and consent of the graduate adviser.

### **GOV 398T. Supervised Teaching in Government.**

Teaching under the close supervision of the course instructor; group meetings with the instructor, individual consultations, and reports throughout the teaching period. Three lecture hours a week for one semester. Prerequisite: Graduate standing, appointment as a teaching assistant, and consent of the graduate adviser.

### **GOV 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **GOV 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Government 399R, 699R, or 999R.

## **History**

*Master of Arts  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Garrison Hall (GAR) 1.104B, phone (512) 471-3261, fax (512) 475-7222; campus mail code: B7000

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of History, 128 Inner Campus Drive, Stop B7000, Austin TX 78712

**URL:** <http://www.utexas.edu/cola/depts/history/graduate/overview.php>

### **Facilities for Graduate Work**

Graduate students in history have access to major collections of research materials in a number of fields. The Benson Latin American Collection of printed and manuscript materials is of international importance for research and study in the history of Latin America in general and Mexico in particular. The Lyndon Baines Johnson Library and Museum and its Oral History Project offer an unprecedented wealth of material for the study of United States history in the Eisenhower, Kennedy, and Johnson years. In the Perry-Castañeda Library, the Harry Ransom Center, and the Dolph Briscoe Center for American History are major collections related to the history of science, twentieth-century writers, British and European history, and the history of Texas, the South, and the West, and documents of the United States and of the United Nations. The

Natchez Trace Collection in the Dolph Briscoe Center for American History provides an unparalleled resource for the study of the history of the lower Mississippi region in the nineteenth century. At the Episcopal Theological Seminary of the Southwest near the University campus are the national archives of the Episcopal Church, containing books and manuscripts from the colonial period onward.

## **Areas of Study**

Graduate study in history is offered in the following major fields: Africa; Atlantic; cross-area thematic; East Asia; early modern Europe; history of science, technology, and medicine; Latin America; medieval Europe; Middle East; modern Europe; South Asia; and United States.

## **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Robert H Abzug	Madeline Y Hsu
Kamran S Aghaie	Bruce J Hunt
Kamran Ali	Jacqueline Jones
Samer M Ali	Neil D Kamil
Daina R Berry	Mark A Lawrence
Marion Enid Bodian	Brian P Levack
Henry W Brands	Philippa Judith Levine
Benjamin C Brower	Huaiyin Li
Jonathan C Brown	Tatjana Lichtenstein
Erika M Bsumek	William R Louis
Virginia Garrard Burnett	Alberto A Martinez
Matthew J Butler	Aloysius P Martinich
Jorge Canizares	Tracie M Matysik
Ruramisai Charumbira	Mark Metzler
Indrani Chatterjee	Steven Mintz
Sally H Clarke	Leonard N Moore
Judith G Coffin	Joan H Neuberger
David F Crew	Mary C Neuberger
Janet M Davis	Martha G Newman
Susan Deans-Smith	Robert A Olwell
Lina Maria Del Castillo	Abena Dove Agyepoma Osseo-
James R Denbow	Asare
Yoav Di-Capua	Megan Margaret Raby
Jennifer V Ebbeler	Mark C Smith
Oloruntoyin O Falola	Denise A Spellberg
William E Forbath	Nancy K Stalker
George B Forgie	Michael B Stoff
Alison K Frazier	Jeremi Suri
Seth W Garfield	Cynthia M Talbot
Laurie B Green	Alan Tully
Kali N Gross	Ann Twinam
Sumit Guha	James Martin Vaughn
Frank A Guridy	Juliet E K Walker
Julie Hardwick	Charters S Wynn
	Emilio Zamora

## **Degree Requirements**

### **Master of Arts**

The degree is offered in three options: with thesis, with report, and without thesis or report. The thesis option requires at least thirty semester hours of coursework, including one research seminar; the report option requires at least thirty-three hours, including two research seminars; and the option without thesis or report requires at least thirty-six hours, including two research seminars. All options require at least six hours of supporting coursework taken outside the major field of specialization in history;

some or all of these six hours may be taken either within or outside the department. With the exception of the major field in United States history, all options require demonstrated competence in a foreign language. Each student's Program of Work must be approved by the student's primary adviser and the graduate adviser.

## Doctor of Philosophy

The Graduate Program Committee maintains close control over admission to the doctoral program; students are reviewed each year until they enter candidacy, and are approved for continuation only if the committee believes the student will excel in doctoral work.

Students who enter the department with a master's degree are evaluated for admission to the doctoral program after completing their first semester in the department; those who enter with a bachelor's degree, after their second semester.

The doctoral degree student must complete at least thirty-six hours of graduate work, at least twenty-four of which must be in history. At least six of the required twenty-four hours must be in research seminars (or at least three of the twenty-four hours if the student has written a master's thesis at the University). The student must also complete a twelve-hour supporting field outside the major field of interest in history; some or all of these twelve hours may be taken either within or outside the department. Courses taken at the University for the master's degree are counted toward the hours required for the doctoral degree. The graduate adviser may also permit transfer of up to twelve hours of graduate credit from another institution.

The student must fulfill the foreign language requirement for the major field as prescribed in the official Program of Work of the department.

To qualify for admission to candidacy for the doctoral degree, the student must pass both a written and an oral examination in the major field. He or she must then write a dissertation and defend it before a supervisory committee of at least five faculty members, including one member from outside the department.

The student must meet any other requirements prescribed individually by the Graduate Studies Committee or by the dissertation supervisory committee.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### History: HIS

#### HIS 380K. History of Science.

Topics cover scientific development since ancient times, including the scientific revolution, 1500–1800; the development of specific scientific disciplines; and the relationship between science and social change. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

#### HIS 380L. Topics in European Imperialism.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

**Topic 1: European Imperialism: British Empire.** Same as Asian Studies 391 (Topic 3) and Middle Eastern Studies 385 (Topic 12). Study of the British empire in the Middle East, Asia and Africa. Only one of the following may be counted: Asian Studies 391 (Topic 3), History 380L (Topic 1), Middle Eastern Languages and Cultures 381 (Topic 12: European Imperialism: British Empire), 385 (Topic 12). Additional prerequisite: Graduate standing.

#### HIS 381. Topics in World History.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

#### HIS 381J. Research Seminar in World History.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

#### HIS 382H. Research Seminar in the History of East and South Asia.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

#### HIS 382J. Research Seminar in African History.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary.

#### HIS 382L. Topics in African History.

Seminar on selected topics on precolonial African societies and African societies since 1875. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

#### HIS 382N. Topics in the History of East and South Asia.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; some topics also require consent of instructor.

**Topic 1: Social and Religious Reform in Modern India.** Same as Asian Studies 384 (Topic 5: Social and Religious Reform in Modern India). Only one of the following may be counted: Asian Studies 384 (Topic 5), History 382N (Topic 1), Religious Studies 394T (Topic: Social and Religious Reform in Modern India).

**Topic 2: Women in Islamic Societies.** Same as Asian Studies 391 (Topic 7: Women in Islamic Societies) and Middle Eastern Studies 385 (Topic 7: Women in Islamic Societies). Only one of the following may be counted: Asian Studies 391 (Topic 7), History 382N (Topic 2), Middle Eastern Studies 385 (Topic 7).

**Topic 4: Communalism in Colonial India.** Same as Asian Studies 384 (Topic 2: Communalism in Colonial India).

#### HIS 382Q. Introductory Conference Course in African History.

Three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and written consent of instructor; consent forms are available in the departmental graduate advising office.

**HIS 382R. Introductory Conference Course in Asian History.**

Three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and written consent of instructor; consent forms are available in the departmental graduate advising office.

**HIS 382S. Introductory Conference Course in Middle Eastern History.**

Three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and written consent of instructor; consent forms are available in the departmental graduate advising office.

**HIS 382T. Introductory Conference Course in European History.**

Three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and written consent of instructor; consent forms are available in the departmental graduate advising office.

**HIS 382U. Introductory Conference Course in American History.**

Three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and written consent of instructor; consent forms are available in the departmental graduate advising office.

**HIS 382V. Introductory Conference Course in Latin American History.**

Three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and written consent of instructor; consent forms are available in the departmental graduate advising office.

**HIS 383. Seminar in Modern European History.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

**HIS 383C. Literature of European History.**

Three lecture hours a week for one semester. Required of all entering graduate students in European history. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

- Topic 1: Literature of European History: The Medieval Period.**
- Topic 2: Literature of European History: The Early Modern Period.**
- Topic 3: Literature of European History: The Modern Period.**

**HIS 383J. Research Seminar in Modern European History.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

**HIS 383L. Seminar in General Economic History.**

Same as Economics 383K. A historical study of economic development and economic policy. The equivalent of three lecture hours a week for one semester. With consent of instructor, may be repeated for credit when the topics vary. Prerequisite: Graduate standing, six semester hours of upper-division coursework in economics or related history or government, and six additional semester hours of upper-division coursework in social science or business.

**HIS 383M. Studies in the Atlantic Worlds.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

**HIS 384K. Seminar in British History.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

**HIS 384M. Seminar in Tudor-Stuart History.**

Reading and research in the history of England under the Tudors and Stuarts, 1485-1689. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

**HIS 386K. Seminar in Latin American History.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, reading knowledge of Spanish or Portuguese, and consent of the graduate adviser.

**HIS 386L. Research Seminar in Latin American History.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, reading knowledge of Spanish or Portuguese, and consent of the graduate adviser; some topics also require consent of instructor.

**HIS 387J. Research Seminar in Early Modern Europe.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

**HIS 387M. Studies in Early Modern Europe.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

**HIS 388J. Research Seminar in Middle Eastern History.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

**HIS 388K. Seminar in Middle Eastern History.**

Development of Middle Eastern history since the beginning of modern times. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; some topics also require consent of instructor.

**Topic 1: Ottoman Egypt and Syria, 1516-1918.** Same as Middle Eastern Studies 381 (Topic 18: Ottoman Egypt and Syria, 1516-1918).

**Topic 2: Intellectual History of Indo-Iranian Islam.** Same as Asian Studies 390 (Topic 6: Intellectual History of Indo-Iranian Islam) and Middle Eastern Studies 381 (Topic 37: Intellectual History of Indo-Iranian Islam).

**HIS 388M. Problems and Methods of Historical Demography.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

**HIS 389. Research Seminar in United States History.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

**HIS 391C. Conference Course.**

Designed to expand the graduate student's opportunity for individual consultation. Conference course. May be repeated for credit. Prerequisite: Graduate standing and written consent of instructor; consent forms are available in the departmental graduate advising office.

### **HIS 392. Seminar in United States History.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser; some topics also require consent of instructor.

### **HIS 393L. Qualifying Examination.**

Preparation for qualifying examinations. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### **HIS 394H. Introduction to Historical Inquiry.**

Introduction to a variety of theoretical, methodological, or historiographical approaches to the past. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### **HIS 395. Seminar in Bibliography and Methods.**

A seminar to acquaint the advanced student with the nature and extent of materials for study and writing in United States history. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **HIS 397K. Literature of United States History.**

Survey of historical writing and historiography from colonial times to the present. Three lecture hours a week for one semester. Required of all entering graduate students in United States history. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser; additional prerequisites vary with the topic.

**Topic 1: Literature of United States History Before 1865.** Survey of historical writing and historiography to 1865. Designed to introduce students to the field of early American history.

**Topic 2: Literature of United States History Since 1865.** Examines trends in American historiography from 1865 to the present.

### **HIS 397L. Medieval History.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser; some topics also require consent of instructor.

### **HIS 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in history and consent of the graduate adviser; for 698B, History 698A.

### **HIS 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in history and consent of the graduate adviser.

### **HIS 398T. Supervised Teaching in History.**

Weekly group meetings with the instructor, individual consultations, and reports. Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### **HIS 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **HIS 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: History 399R, 699R, or 999R.

## **Human Dimensions of Organizations**

*Master of Arts*

### **For More Information**

**Campus address:** Belmont Hall (BEL) 240; phone (512) 232-7343; campus mail code: E4200

**Mailing address:** The University of Texas at Austin, Graduate Program in Human Dimensions of Organizations, 2109 San Jacinto Boulevard E4200, Room 240, Austin TX 78712

**E-mail:** [hdo@austin.utexas.edu](mailto:hdo@austin.utexas.edu)

**URL:** <http://hdo.utexas.edu>

### **Facilities for Graduate Work**

The human dimensions of organizations (HDO) program combines faculty and resources from the departments of anthropology, English, government, linguistics, philosophy, psychology, religious studies, rhetoric and writing, sociology, marketing, and mathematics, as well as the School of Information. Facilities of these academic units, including laboratory, library, and other research facilities, are available for use. Students also have access to University-wide library and computer facilities; to the vast archival materials held at the Harry Ransom Center; and to personnel, facilities, and expertise at the IC2 Institute, including the Austin Technology Incubator.

Additionally, classrooms, meeting spaces, and research facilities are accessible to students during the program's non-standard teaching times twice a month on Friday evenings and Saturdays. This schedule has been tailored to meet the needs of the program's graduate students, who are typically employed full time while in the program.

As part of the distance-learning program, live videoconferencing facilities are also available to students unable to commute to Austin, enabling distance learners to attend classes in real time.

### **Areas of Study**

The Master of Arts degree in human dimensions of organizations, designed for students with at least three years of work experience, provides working professionals with a comprehensive understanding of human behavior and experience as it relates to today's global marketplace. To deepen students' understanding of these principles, the program's coursework focuses on conceptualizing and implementing organizational change from a range of approaches, including cultural, ethical, linguistic, and psychological perspectives, and using both qualitative and quantitative research methods.

The program's curriculum requires students to examine real-world challenges through a variety of disciplinary lenses. By acquiring skills central to specific disciplines, students are able to draw on a range of approaches to analyze, consider, and improve the structure and function of organizations.

The program's faculty is made up of specialists in the College of Liberal Arts and from across the University.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

David I Beaver	Clay Spinuzzi
Daniel A Bonevac	Pauline T Strong
Zachary S Elkins	John W Traphagan
Arthur B Markman	Paul B Woodruff
Elizabeth Richmond-Garza	

## Admission Requirements

An admissions committee composed of Human Dimensions of Organizations Graduate Studies Committee members evaluates applications, giving preference to candidates who demonstrate a strong academic background and a clear sense of their research goals in the HDO program. Other requirements include: (1) an official GRE or GMAT score taken within the past five years (foreign students are required to submit TOEFL scores as well); (2) a resume or CV detailing relevant work and academic experience; (3) two essays; and (4) three letters of recommendation. Applicants must also meet the minimum requirements for graduate study at the University.

## Degree Requirements

The program requires thirty-six semester hours of coursework completed over eighteen months. Students must enter the program in the fall and take courses in a prescribed sequence; there are no electives. Each semester begins with an intensive week of study on the University campus, followed by twice-monthly classes on both Friday evenings and Saturdays. Finally, with the approval of the graduate adviser, a capstone project of about 10,000 words (fifty to sixty pages) must be written, submitted, and presented during graduation week. The capstone project is the culmination of the work in the degree program and should apply to a challenge facing a specific organization.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Human Dimensions of Organizations: HDO

#### HDO 380. Cultural Perspectives on the Human Dimensions of Organizations.

Restricted to students in the human dimensions of organizations degree program. Examines broad aspects of the role of culture in organizations through a variety of disciplinary lenses. Culture includes both global cultures, as well as cultures created by organizations. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

#### HDO 381. Individual Perspectives on the Human Dimensions of Organizations.

Restricted to students in the human dimensions of organizations degree program. A general introduction to the roles of individuals in organizations

from a multidisciplinary perspective. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

#### HDO 382. Approaches to Leadership.

Restricted to students in the human dimensions of organizations degree program. Examines broad aspects of organizational leadership through a variety of disciplinary lenses. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

#### HDO 383. Society, Culture and Organizational Diversity.

Restricted to students in the human dimensions of organizations degree program. Examines multidisciplinary frameworks for understanding society and culture in organizations. The effects of gender, race/ethnicity, sexual orientation, culture, and globalization on organizational change may be discussed. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

#### HDO 384. Organizational Inertia, Decision Making and Change.

Restricted to students in the human dimensions of organizations degree program. Reviews theories and methods for understanding how organizational environments support habits, and how individuals and groups make decisions. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

#### HDO 285. Organizational Ethics.

Restricted to students in the human dimensions of organizations degree program. Examines ethics as they pertain to organizational contexts. Two lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

#### HDO 386. Persuasion and Argumentation.

Restricted to students in the human dimensions of organizations degree program. Focuses on how effective persuasion works within organizations and at the individual level. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

#### HDO 287. The Structure of Organizations.

Restricted to students in the human dimensions of organizations degree program. A multidisciplinary approach to understanding how money, information, and influence flow through organizations and between related organizations. Two lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

#### HDO 388. Conference Course in Human Dimensions of Organizations.

Restricted to students in the human dimensions of organizations degree program. Individual directed study of selected topics in related human dimensions of organizations field. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of the graduate adviser.

#### HDO 390. Qualitative Research Methods.

Restricted to students in the human dimensions of organizations degree program. Covers qualitative approaches to studying people in organizational settings. Approaches may include narrative, phenomenology, grounded theory, ethnography, case studies. Three

lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

### **HDO 391. Quantitative Research Methods.**

Restricted to students in the human dimensions of organizations degree program. Covers quantitative approaches for studying the human dimensions of organizations. Approaches may include descriptive statistics, interpreting regression and correlational analysis, inferential statistical analysis, and cluster analysis. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

### **HDO 292. Computational Methods.**

Restricted to students in the human dimensions of organizations degree program. Analyzing and interpreting data drawn from large-scale data sets. Approaches include social network analysis, web analytics, and linguistic corpus analysis. Two lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

### **HDO 695. Capstone Project.**

Restricted to students in the human dimensions of organizations degree program. Focuses on the completion of the capstone project, the culmination of work in the human dimensions of organization degree. The equivalent of six lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, consent of the graduate adviser, and consent of instructor.

### **HDO 197. Practicum in Human Dimensions of Organizations.**

Restricted to students in the human dimensions of organizations degree program. Applied study in human dimensions of organizations. The equivalent of one lecture hour a week for one semester, plus additional hours to be arranged. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, consent of the graduate adviser, and consent of instructor.

## **Iberian and Latin American Languages and Cultures**

*Master of Arts  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Benedict Hall (BEN) 2.116, phone (512) 471-4936, fax (512) 471-8073; campus mail code: B3700

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Spanish and Portuguese, 150 W 21st St., B3700, Austin TX 78712

**URL:** <http://www.utexas.edu/cola/depts/spanish/>

### **Facilities for Graduate Work**

The Perry-Castañeda Library contains extensive holdings related to the history, languages, and cultures of Spain, Portugal, and Latin America. Students also have access to an array of electronic databases, journals, and books related to these areas through the University Libraries Web site (<http://www.lib.utexas.edu>). In addition, the Benson Latin American Collection is the world's foremost university research collection for Latin American studies, with more than eight hundred thousand volumes as well as extensive collections of manuscripts, maps, photographs, and broadsides.

The several language and computer laboratories furnish excellent opportunities for technical and professional preparation for teaching and research in Romance languages and linguistics. A large collection of tape recordings of dialect materials is also available.

### **Areas of Study**

Graduate work in Iberian and Latin American languages and cultures is offered in three tracks: Iberian and Latin American literatures and cultures, literatures and cultures in Portuguese and Spanish, and Iberian and Latin American linguistics.

### **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Omoniyi Afolabi	Naomi E Lindstrom
Arturo Arias	Kelly McDonough
Jossianna Arroyo Martinez	Chiyo Nishida
Jason R Borge	Gabriela Polit
Barbara Ellen Bullock	Cory A Reed
Luis E Carcamo-Huechante	Jill Robbins
Hector Dominguez-Ruvalcaba	Sergio Romero
Michael P Harney	Sonia Roncador
R Roland Hinojosasmith	Cesar A Salgado
Orlando R Kelm	Sandro Sessarego
Dale A Koike	Madelin Sutherland-Meier
Lorraine Leu	Almeida J Toribio

## **Admission and Degree Requirements**

All entering students must hold a bachelor's degree with a major in Spanish and Portuguese, or must demonstrate equivalent knowledge. All students must demonstrate proficiency in a second language; this requirement may be fulfilled by exam, previous credit, or ten to twelve semester hours of additional coursework.

All graduate students must complete Iberian and Latin American Languages and Cultures 380 or 381, as well as twelve semester hours of elective coursework in their first three long semesters. By the end of the third long semester, students must have selected or been assigned a mentor from among the department's graduate faculty.

Further requirements specific to the master's degree and the doctoral degree are given below.

### **Master of Arts**

The MA degree is available only to students enrolled in the PhD degree program in Iberian and Latin American languages and cultures who wish to complete a master's on the way to the doctorate, and those who are allowed by the Graduate Studies Committee to elect to receive a terminal master's degree after having successfully submitted and defended a doctoral qualifying paper. If the doctoral qualifying paper is deemed unacceptable, the student may still petition to receive the MA, requesting that the doctoral qualifying paper be used as the basis for satisfying the master's report requirement. Students who are approved to complete the MA degree requirements must register for Iberian and Latin American Languages and Cultures 398R during the semester of their graduation.

# Doctor of Philosophy

## General Requirements

The doctoral program in Iberian and Latin American languages and cultures includes three tracks which share the same five-year structure, described below. These tracks are: (1) Iberian and Latin American literatures and cultures, (2) literatures and cultures in Portuguese and Spanish, and (3) Iberian and Latin American linguistics. All students must demonstrate proficiency in a second language beyond Spanish or Portuguese. In the first and third tracks, the second language may be any language other than English that is relevant to the student's proposed field of study and is approved by the graduate adviser. Students in the second track must choose Spanish or Portuguese as the second language.

Students seeking the PhD must complete a minimum of fifty-four semester hours of coursework. Coursework includes the following required courses: Iberian and Latin American Languages and Cultures 380 or 381, 385T, 394, 395, 396, 398T, 399R or 999R, and 399W or 999W. The remaining semester hours may be fulfilled through elective courses at the graduate level, as approved by the graduate adviser. At least fifteen of the twenty-seven semester hours of elective coursework must come from courses offered by the Department of Spanish and Portuguese.

For doctoral students, the fourth long semester is dedicated to the elaboration of the doctoral qualifying paper. In the first half of the semester, in consultation with the student's mentor and two additional readers appointed by the graduate adviser, each student must write and submit a paper demonstrating a mastery of a specialized topic, theoretical rigor, sophisticated research techniques, and a command of structure, academic style, and organization. If all three readers deem the paper acceptable, the student will defend the paper before the committee during the second half of the semester.

Upon the successful completion of the doctoral qualifying paper, students will enroll in nine hours of additional elective coursework, generally taken in the fifth long semester.

The sixth and seventh long semesters are dedicated to the preparation of the doctoral dissertation fields and proposal. In the sixth long semester, in consultation with a Dissertation Proposal Committee (consisting of the student's mentor, three other Graduate Studies Committee faculty members from the department, and one faculty member from outside the department), each student will prepare and write critical summaries of a number of field lists. If the Dissertation Proposal Committee considers the list and accompanying summaries acceptable, the student will develop a doctoral dissertation proposal, under the supervision of his or her mentor, which the student will defend before the twelfth week of the seventh long semester. The student will also enroll in Iberian and Latin American Languages and Cultures 385T, *Teaching Practicum* during the seventh long semester.

## Tracks

### Iberian and Latin American Literatures and Cultures

The Iberian and Latin American literatures and cultures track addresses the broad range of linguistic and cultural contacts that currently comprise the field. This track allows students to complete their primary coursework in Portuguese or Spanish, and then choose a second specialization in literature and culture in a language that is not Spanish or Portuguese, such as an African language, Amazonian language, Arabic, Chinese, French, German, Maya K'iche, or Nahuatl.

### Literatures and Cultures in Portuguese and Spanish

The literatures and cultures in Portuguese and Spanish track allows students to complete their primary coursework in Portuguese or Spanish while also addressing a range of linguistic and cultural contacts; students then choose either Spanish or Portuguese as the language of their second specialization. This track is designed to bridge the traditional divide between Brazil and Spanish America, and between Portugal and Spain.

### Iberian and Latin American Linguistics

In the Iberian and Latin American linguistics track, students pursue coursework in areas that bridge theoretical and applied approaches in the study of the structural and meaning-bearing properties of standardized and local languages, the sociolinguistics of the Ibero-American world, the development of second languages in natural and academic settings, and the qualitative and quantitative analysis of speech samples collected in the field and in the laboratory. This training is supported and augmented by coursework in the core linguistic areas of phonology and syntax as well as in the research methods of phonetics, discourse analysis, corpus linguistics, psycholinguistics, and anthropological linguistics through the offerings of graduate programs in the Department of Spanish and Portuguese and allied departments, including linguistics, French and Italian, curriculum and instruction, psychology, communication, anthropology, and Latin American studies.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Iberian and Latin American Languages and Cultures: ILA

#### ILA 380. Introduction to Theory and Research of Literature and Culture.

An introductory survey of theories, research methods, and issues of professionalization relevant to the study of Latin American and Iberian literatures and cultures. Designed to be taken in the first long semester of graduate study. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

#### ILA 381. Introduction to Theory and Research of Linguistics.

An introduction to the prevalent theories, research methods, and issues of professionalization relevant to the study of the language forms and language practices of individuals and societies. Designed to be taken in the first long semester of graduate study. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

#### ILA 385T. Teaching Practicum.

Mentorship and pedagogical training by working one-on-one with a faculty member on the development and design of an undergraduate, upper-division level course in their area of specialization. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing; Iberian and Latin American Languages and Cultures 398T; admission to candidacy for the doctoral

degree, including an approved dissertation proposal; and consent of the graduate adviser.

#### **ILA 386. Topics in Iberian and Latin American Linguistics.**

Topics in Iberian and Latin American linguistics, including diasporic and indigenous communities. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

#### **ILA 387. Topics in Iberian and Latin American Literatures and Cultures: Spanish.**

Topics in the literatures and cultures of Spanish America, Spain, and related diasporas. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

#### **ILA 388. Topics in Iberian and Latin American Literatures and Cultures: Portuguese.**

Topics in the literatures and cultures of Brazil, Portugal, and related diasporas. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

#### **ILA 389. Topics in Iberian and Latin American Literatures and Cultures: Spanish and Portuguese.**

Comparative topics in the literatures and cultures of Brazil, Spanish America, the Iberian Peninsula, and related diasporas. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

#### **ILA 394. Supervised Preparation of the Qualifying Paper.**

Supervised preparation for the doctoral degree qualifying paper. Designed to be taken in the same semester the student submits the paper. Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

#### **ILA 395. Supervised Preparation of the Dissertation Fields.**

Preparation of field lists, and critical summaries of these lists, under faculty supervision. Prepares students for Iberian and Latin American Languages and Cultures 396. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

#### **ILA 396. Supervised Preparation of the Dissertation Proposal.**

Supervised preparation for the dissertation proposal for the doctoral degree. Designed to be taken in the same semester the student submits the proposal, typically the sixth or seventh long semester of study. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Iberian and Latin American Languages and Cultures 395, and consent of instructor and the graduate adviser.

#### **ILA 398R. Master's Report.**

Preparation of the report required to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

#### **ILA 398T. Supervised Teaching in Spanish and Portuguese.**

Required for teaching assistants during their first semester that they teach. Fundamentals of foreign language teaching methodology, with particular reference to the teaching of Spanish and Portuguese. Presentation of theoretical concepts on which classroom practice is based, in conjunction with teaching under close supervision of the course instructor, individual consultations, reading assignments, and reports. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing, appointment as a teaching assistant, and consent of instructor and the graduate adviser.

#### **ILA 399R, 699R, 999R. Dissertation.**

Supervised research and reading for the dissertation for the doctoral degree. Designed to be taken in the semester following successful submission of the dissertation proposal, typically the seventh or eighth long semester of study. Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree, and consent of instructor and the graduate adviser.

#### **ILA 399W, 699W, 999W. Dissertation.**

Supervised writing of the dissertation for the doctoral degree. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Iberian and Latin American Languages and Cultures 399R, 699R, or 999R, and consent of instructor and the graduate adviser.

### **Portuguese: POR**

#### **POR 380. Studies in Luso-Brazilian Civilization and Culture.**

Topics in the social, political, and cultural ideas of Portugal and Brazil. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, six semester hours of upper-division coursework in Portuguese, and consent of the graduate adviser.

#### **POR 381. Studies in Brazilian Literature.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, six semester hours of upper-division coursework in Portuguese, and consent of the graduate adviser.

**Topic 1: Comparative Studies in the Literatures of Brazil and Spanish America.** Same as Spanish 380K (Topic 1: Comparative Studies in the Literatures of Brazil and Spanish America).

#### **POR 382. Studies in Portuguese Literature.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and six semester hours of upper-division coursework in Portuguese.

#### **POR 284P, 384P. Examination Preparation.**

Preparation for the master's comprehensive and doctoral qualifying examination. Designed to be taken in the same semester in which the student takes the examination. Individual instruction. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

#### **POR 285L, 385L. Conference Course in Luso-Brazilian Literatures and Linguistics.**

For students with special interests not met by other courses offered in any one semester. Conference course. May be repeated for credit. Prerequisite: Graduate standing and written consent of the graduate adviser.



### **POR 393. Topics in Luso-Brazilian Literatures and Linguistics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **POR 395L. Comprehensive Examination Preparation.**

Supervised preparation for the Comprehensive Examination for the doctoral degree. Conference course. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and completion of all course requirements for the doctoral degree.

### **POR 396K. Comparative Romance Linguistics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in languages and consent of instructor and the graduate adviser.

**Topic 1: Comparative Romance Linguistics.** Same as Spanish 396K (Topic 1: Comparative Romance Linguistics).

**Topic 2: Introduction to Romance Linguistics.** Same as Italian 396K (Topic 1: Introduction to Romance Linguistics), Linguistics 383 (Topic 3: Introduction to Romance Linguistics), French 396K (Topic 1: Introduction to Romance Linguistics), and Spanish 396K (Topic 2: Introduction to Romance Linguistics).

### **POR 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in Portuguese and consent of the graduate adviser; for 698B, Portuguese 698A.

### **POR 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in Portuguese and consent of the graduate adviser.

### **POR 398T. Supervised Teaching.**

Same as Spanish 398T. Fundamentals of foreign language teaching methodology, with particular reference to the teaching of Portuguese or Spanish. Presentation of theoretical concepts on which classroom practice is based, in conjunction with teaching under close supervision of the course instructor, individual consultations, reading assignments, and reports. Three lecture hours a week for one semester. Required for teaching assistants during the first semester that they teach. Offered on the letter-grade basis only. Prerequisite: Graduate standing, appointment as a teaching assistant, and consent of the graduate adviser.

### **POR 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and consent of the graduate adviser.

### **POR 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Portuguese 399R, 699R, or 999R, and consent of the graduate adviser.

## **Spanish: SPN**

### **SPN 380K. Studies in Spanish American Literature.**

Topics include Modernismo; the short story; contemporary trends of the Spanish American novel; the literary prose of Sarmiento; gaucho literature; Ruben Dario; contemporary Argentine fiction. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, twelve semester hours

of upper-division coursework in Spanish, and consent of the graduate adviser.

### **Topic 1: Comparative Studies in the Literatures of Brazil and Spanish America.**

### **SPN 380M. Studies in the History of Ideas in Spain and Latin America.**

Intensive study of cultural and ideological currents, especially as they are reflected in the works of essayists and other writers. Topics include Spain and European culture; European thought in Latin America; the Renaissance in Spanish literature and social life; Spain and the Western tradition; Spain between Islam and Christianity; the search for national identity in Mexico; three intellectual generations in Argentina; Hispano-Arabic culture. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, twelve semester hours of upper-division coursework in Spanish, and consent of the graduate adviser.

### **SPN 381M. Studies in Criticism and Literary Genres.**

Examination of the development of certain genres or critical ideas. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, twelve semester hours of upper-division coursework in Spanish, and consent of the graduate adviser.

### **SPN 182M. Proseminar: Methods and Procedures of Graduate Degree Preparation.**

Basic procedural information about preparation for comprehensive and qualifying examinations. Discussion of methods of preparation and the nature of departmental expectations. One lecture hour a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### **SPN 383M. Methods of Study in Spanish Linguistics.**

Examination of various methods of linguistic analysis in Spanish, such as Spanish syntax, discourse analysis, sociolinguistics, or applied linguistics. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in Spanish or in linguistics, six semester hours of upper-division coursework in Spanish, and consent of the graduate adviser.

### **SPN 383N. Studies in Spanish Linguistics.**

Advanced topics in specialized aspects of Spanish linguistics, such as Spanish historical linguistics, Hispanic phonology, Spanish morpho-syntax, Spanish semantics, Spanish-English contrastive analysis, Spanish dialectology, the Spanish of the Americas, and Spanish language acquisition. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, twelve semester hours of upper-division coursework in Spanish, and consent of the graduate adviser.

### **SPN 284P, 384P. Examination Preparation.**

Individual preparation for the master's comprehensive and doctoral qualifying examination. Designed to be taken in the same semester in which the student takes the examination. Individual instruction. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### **SPN 285L, 385L. Conference Course in Hispanic Literatures and Linguistics.**

For students needing specialized courses not normally or not often included in the regular course offerings. Conference course. May be repeated for credit. Prerequisite: Graduate standing and written consent of the graduate adviser.

### **SPN 385M. Studies in Spanish Literature since 1700.**

Intensive examination of a period or a major writer. Topics include eighteenth-century essayists, Galdos, la generacion del '98, Miguel de Unamuno, romanticism, Pardo Bazan and Clarin, the theatre of Garcia Lorca, contemporary Spanish poetry. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, twelve semester hours of upper-division coursework in Spanish, and consent of the graduate adviser.

### **SPN 386. Old Spanish Language.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing, twelve semester hours of upper-division coursework in Spanish, and consent of the graduate adviser.

### **SPN 387. Old Spanish Literature.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, twelve semester hours of upper-division coursework in Spanish, and consent of the graduate adviser.

### **SPN 391. Studies in Renaissance and Golden Age Literature of Spain.**

Topics include Don Quijote, Gongorism, La Celestina, the picaresque novel, Lope de Vega, and new literary forms of the Golden Age. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, twelve semester hours of upper-division coursework in Spanish, and consent of the graduate adviser.

### **SPN 393T. Topics in Hispanic Literatures and Linguistics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **SPN 295L, 395L. Comprehensive Examination Preparation.**

Supervised preparation for the comprehensive examination for the doctoral degree. Conference course. Offered on the credit/no credit basis only. Prerequisite: Satisfactory completion of all course requirements for the doctoral degree.

### **SPN 396K. Comparative Romance Linguistics.**

General survey of the development of spoken Latin in Italy, Spain, Portugal, and France; main traits of phonology, morphology, and syntax of each modern derivative language. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in languages and consent of instructor and the graduate adviser.

**Topic 1: Comparative Romance Linguistics.** Same as Portuguese 396K (Topic 1: Comparative Romance Linguistics).

**Topic 2: Introduction to Romance Linguistics.** Same as French 396K (Topic 1: Introduction to Romance Linguistics), Italian 396K (Topic 1: Introduction to Romance Linguistics), Linguistics 383 (Topic 3: Introduction to Romance Linguistics), and Portuguese 396K (Topic 2: Introduction to Romance Linguistics).

### **SPN 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in Spanish and consent of the graduate adviser; for 698B, Spanish 698A and consent of the graduate adviser.

### **SPN 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for

one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in Spanish and consent of the graduate adviser.

### **SPN 398T. Supervised Teaching.**

Same as Portuguese 398T. Fundamentals of foreign language teaching methodology, with particular reference to the teaching of Portuguese or Spanish. Presentation of theoretical concepts on which classroom practice is based, in conjunction with teaching under close supervision of the course instructor, individual consultations, reading assignments, and reports. Three lecture hours a week for one semester. Required for teaching assistants during the first semester that they teach. Offered on the letter-grade basis only. Prerequisite: Graduate standing, appointment as a teaching assistant, and consent of the graduate adviser.

### **SPN 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and consent of the graduate adviser.

### **SPN 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Spanish 399R, 699R, or 999R, and consent of the graduate adviser.

## **Language Teaching and Coordination**

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### **Language Teaching and Coordination: LTC**

#### **LTC 384. Technology Applications in Language Teaching.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **LTC 385. The Foreign Language Learner.**

Reviews the theoretical and empirical research conducted in the field of foreign language acquisition, focusing on the learning process and specifically on the learners themselves. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **LTC 386. Intensive Course Design and Instruction.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **LTC 388. Topics in Language Teaching and Program Coordination.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### **LTC 397P. Practicum.**

Restricted to students pursuing the graduate portfolio in language teaching and program coordination. The equivalent of three lecture hours a week for one semester. Additional hours to be arranged. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

## **Latin American Studies**

*Master of Arts  
Doctor of Philosophy*

## For More Information

**Campus address:** Sid Richardson Hall (SRH) 1.310, phone (512) 471-5551, fax (512) 471-3090; campus mail code: D0800

**Mailing address:** The University of Texas at Austin, Graduate Program, Teresa Lozano Long Institute of Latin American Studies, 2300 Red River Street Stop D0800, Austin TX 78712

**URL:** <http://www.utexas.edu/cola/insts/llilas/>

## Facilities for Graduate Work

The Benson Latin American Collection is the most complete library of its kind in the United States, containing more than eight hundred thousand volumes of printed material in addition to manuscripts, maps, newspapers, and microfilms. Of special interest are the twenty thousand reels of microfilm copies of archival material sourced in Mexico, Spain, England, and Washington DC. Other campus libraries, including the Perry-Castañeda Library, the Fine Arts Library, the Walter Geology Library, and the Architecture and Planning Library, contain additional Latin American material. Students also have access to a variety of electronic journals, books, and bibliographic tools through the University Libraries Web site (<http://www.lib.utexas.edu>).

About sixty-five faculty members regularly teach courses dealing with Latin America, and some 125 additional faculty members have Latin American interests in a wide variety of fields.

## Areas of Study

Graduate work toward a degree in Latin American studies may be concentrated in any academic area in which courses with Latin American content are offered.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Omoniyi Afolabi	Orlando R Kelm
Ricardo C Ainslie	Gregory W Knapp
Chad Alvarez	Dale A Koike
Rosental C Alves	Fernando Luiz Lara
Ronald J Angel	Edgardo M Latrubesse
Arturo Arias	Daniel A Law
Eugenio Yatsuda Arima	David L Leal
Jossianna Arroyo Martinez	Lorraine Leu
Javier Auyero	Leigh L Linden
Cecilia Balli	Naomi E Lindstrom
Sheryl Luzzadder Beach	Sarah L Lopez
Charles E Berg	Raul L Madrid
Jason R Borge	Minkah Makalani
Leigh B Boske	Randall A Marrett
Daniel M Brinks	Leticia J Marteleto
Jonathan C Brown	James D Mauseth
Virginia Garrard Burnett	Kelly McDonough
Matthew J Butler	Daene C McKinney
Karl W Butzer	Martha Menchaca
Esther Calzada	Sofian Merabet
Jorge Canizares	Juan Miro
David Cannatella	Robin D Moore
Luis E Carcamo-Huechante	Deborah K Palmer
Ronald Covey	Jose L Panero
Kelley A Crews	Francisco L Perez
Megan J Crowhurst	Gabriela Polit
Ian W Dalziel	Joseph E Potter
Donna De Cesare	Carlos E Ramos
Susan Deans-Smith	Bryan R Roberts
Lina Maria Del Castillo	Enrique R Rodriguez
Anthony F Di Fiore	Nestor P Rodriguez
Gabriel Diaz Montemayor	Victoria E Rodriguez
Henry A Dietz	Sergio Romero
Hector Dominguez-Ruvalcaba	Sonia Roncador
William Doolittle	Christopher P Salas-Wright
David J Eaton	Cesar A Salgado
Zachary S Elkins	Sandro Sessarego
Nora C England	Bjorn I Sletto
Karen L Engle	Christen Smith
Patience L Epps	Patricia A Somers
William L Fisher	Shannon Speed
George F Flaherty	Chandler W Stolp
Kenneth Flamm	Joseph Straubhaar
Richard R Flores	David S Stuart
Daniel G Fridman	Almeida J Toribio
Seth W Garfield	Rebecca M Torres
Lyndon K Gill	John R Turci
Andrea Giunta	Ann Twinam
Alfonso Gonzales	Luis Urrieta
Gloria Gonzalez-Lopez	Fred Valdez Jr
Edmund T Gordon	Joao H Vargas
Kenneth F Greene	Maria D Wade
Julia E Guernsey	Peter Ward
Nicole Marie Guidotti-Hernandez	David C Warner
Lauren E Gulbas	Kurt G Weyland
Frank A Guridy	Jennifer M Wilks
Laura G Gutierrez	Patricia A Wilson
Charles R Hale	Robert H Wilson
Patricia I Hansen	Samuel M Wilson
R Roland Hinojosasmith	Anthony C Woodbury
Juliet A Hooker	Kenneth R Young
Brian K Horton	Emilio Zamora
Wendy A Hunter	Luis H Zayas
Benjamin Ibarra Sevilla	

## Admission Requirements

The entering master's degree student must have a bachelor's degree, with a major in any discipline. Reading and speaking knowledge of Spanish or Portuguese is required.

Students must hold a master's degree by the time they enter the doctoral program. On rare occasions, admission to the doctoral program may be granted to students without a master's degree; such students are required to earn the master's degree en route to the PhD.

## Degree Requirements

### Master of Arts

Three degree plans are available; one requires a thesis, while the others require two substantial research papers, one in the major field and one in the minor. The major and minor fields may be any academic areas that offer Latin American content coursework, such as anthropology, economics, government, history, sociology, public policy, literature, and art history. Most plans require the completion of at least thirty-three semester hours of coursework, including either the thesis course, Latin American Studies 698, or the primary and secondary report courses, Latin American Studies 397R and 398R. Dual degree programs may require a different number of hours.

Under all of the Master of Arts degree plans, the student must develop a proficiency in either Spanish or Portuguese. Examinations are held each semester, and the student may repeat them until proficiency is indicated. Students are strongly encouraged to study both languages.

### Doctor of Philosophy

The doctoral program is dedicated to providing flexible yet rigorous training for a select number of excellent students whose proposed doctoral program requires an interdisciplinary approach. Our doctoral students combine interdisciplinary training with a focus on practical applications, acquiring not only specialist knowledge of their chosen subject, but also a range of skills and expertise in problem solving and connecting ideas. Upon completion of the degree, students frequently enter professions in which they apply theoretical and methodological knowledge to real-world problems. As part of this training, students are required to participate in a professional placement before defending their doctoral dissertation.

Doctoral students must complete at least thirty semester hours of coursework beyond the master's degree program, excluding hours in the dissertation courses.

During the first year after admission, the student will work to select a supervising professor for his or her dissertation committee. The supervising professor will serve as chair of the dissertation committee and will be responsible for coordinating the program of study with the student and the Teresa Lozano Long Institute of Latin American Studies graduate adviser. Coursework (interdisciplinary to the extent feasible) and other requirements for the degree are decided upon jointly by the student, the dissertation committee, and the graduate adviser. The student is expected to develop a high level of competence in reading and speaking either Spanish or Portuguese. He or she must also attain reading-level competence in the other language or some alternative language appropriate to the program of study and approved by the dissertation committee and graduate adviser.

In the social science fields, the student is also expected to become proficient in the appropriate methodologies, such as statistics, quantitative data analysis, ethnography, discourse and textual analysis, etc. The student is required to take comprehensive examinations and to defend his

or her dissertation prospectus by the end of the third year in residence. These examinations are determined by the dissertation committee in consultation with the student.

Doctoral students in Latin American studies must submit a dissertation of an interdisciplinary nature. A dissertation committee of at least five professors will be selected by the student, and approved by the Graduate School, in order for the student to advance to candidacy.

The student is admitted to candidacy upon passage of written and oral examinations conducted by the dissertation committee. A research proposal for the dissertation should be submitted by the student to the dissertation committee and the graduate adviser. Evaluation of the proposal is in the hands of the dissertation committee, which may, if appropriate, incorporate the proposal into the oral examination. The doctoral dissertation is submitted to a dissertation supervising committee appointed by the graduate dean. The supervising professor must be from the academic area about which the work is being written.

Details on both the master's and the doctoral degree program are available from the graduate adviser.

## Dual Degree Programs

The Teresa Lozano Long Institute of Latin American Studies offers the following dual degree programs. More information is available from the graduate adviser.

Field(s) of Study	Degree(s)
Business administration	Master of Business Administration
Communication studies	Master of Arts
Community and regional planning	Master of Science in Community and Regional Planning
Global policy studies	Master of Global Policy Studies
Information studies	Master of Science in Information Studies
Journalism	Master of Arts
Law	Doctor of Jurisprudence
Public affairs	Master of Public Affairs
Radio-television-film	Master of Arts
Social Work	Master of Science in Social Work

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Indigenous Languages of Latin America: LAL

#### LAL 385K. Intensive Graduate Language Instruction I.

Intensive cultural and literacy-focused training in an indigenous language at the beginning level in preparation for research. Six lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of graduate adviser.

#### LAL 385L. Intensive Graduate Language Instruction II.

Intensive cultural and literacy-focused training in an indigenous language at the intermediate level in preparation for research. Six lecture hours a week for one semester. May be repeated for credit when the topics vary.

Prerequisite: Indigenous Languages of Latin America 385K and consent of graduate adviser.

### **LAL 385M. Intensive Graduate Language Instruction III.**

Intensive cultural and literacy-focused training in an indigenous language at the intermediate/advanced level in preparation for research. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Indigenous Languages of Latin America 385L and consent of graduate adviser.

## **Latin American Studies: LAS**

### **LAS 381. Topics in Latin American Studies.**

A varied selection of topics each semester, taught by different faculty members and visiting professors. Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 1: International Migration.** Same as Sociology 389K (Topic 4: International Migration). May be counted toward either the demography specialization or the race and ethnicity specialization in the sociology degree program.

**Topic 6: Housing Practices and Public Policy in Latin America.** Same as Sociology 396P (Topic 13). May be counted toward the political sociology, development and globalization specialization in the sociology degree program. Only one of the following may be counted: Sociology 395D (Topic 5), 396P (Topic 13), Latin American Studies 381 (Topic 6).

**Topic 8: International Business Fellows Seminar.** Same as Asian Studies 391 (Topic 6: International Business Fellows Seminar); Middle Eastern Studies 380; and Russian, East European, and Eurasian Studies 380. Multidisciplinary seminar for students in area studies, business administration, law, and public policy. The faculty includes both academics and business leaders. Only one of the following may be counted: Asian Studies 391 (Topic 6), International Business 395 (Topic: International Business Fellows Seminar), Latin American Studies 381 (Topic 8), Middle Eastern Studies 380, Public Affairs 388K (Topic: International Business Fellows Seminar), Russian, East European, and Eurasian Studies 380. Offered on the letter-grade basis only.

**Topic 11: Information Resources on, and Services for, Hispanic Americans.** Information needs of Hispanic Americans; roles of academic, public, and school libraries in meeting those needs.

**Topic 12: Information Resources on Latin America.** Historical survey of sources of information on Latin America: bibliographical literature from and about Latin America during the colonial, national, and contemporary periods; various types of book and nonbook sources of information available to contemporary scholars. Additional prerequisite: Proficiency in Spanish or Portuguese and consent of instructor.

**Topic 14: Introduction to the Sociology of Latin America.** Same as Sociology 396P (Topic 10). Only one of the following may be counted: Latin American Studies 381 (Topic 14), Sociology 395D (Topic 2), 396P (Topic 10). May be counted toward the political sociology/development and globalization specialization in the sociology degree program.

**Topic 15: Local Economic Development.**

**Topic 16: Maya Hieroglyphic Writing.** Additional prerequisite: Consent of the graduate adviser.

**Topic 17: Development Communication.** Same as Middle Eastern Studies 384 (Topic 2). Only one of the following may be counted: Asian Studies 391 (Topic 2: Development Communication), Latin American Studies 381 (Topic 17), Middle Eastern Studies 381 (Topic 34: Development Communication), 384 (Topic 2), Radio-Television-Film

387D (Topic: Development Communication). Additional prerequisite: Consent of instructor and the graduate adviser.

**Topic 19: Political Economics of International Communication.**

Latin American Studies 381 (Topic 19) and Radio-Television-Film 393P (Topic: Political Economics of International Communication) may not both be counted. Additional prerequisite: Consent of instructor and the graduate adviser.

**Topic 20: Regional Planning in Latin America.**

**Topic 21: Business in Emerging Markets.** Same as Middle Eastern Studies 384 (Topic 1: Business in Emerging Markets). Only one of the following may be counted: Latin American Studies 381 (Topic: Business in Developing Countries), 381 (Topic 21), Middle Eastern Studies 381 (Topic: Business in Developing Countries), 381 (Topic 36: Business in Emerging Markets), 384 (Topic 1).

**Topic 22: Documentary Tradition of Latin America.** Same as Journalism 395 (Topic 4: Documentary Tradition of Latin America). Study of still photographic and video documentary work by Latin Americans about Latin America. Production of photographic essays on Latin American culture. Three lecture hours and four laboratory hours a week for one semester.

**Topic 23: Poverty and Marginality in the Americas.** Same as Sociology 396P (Topic 17). Review of the past and present ethnographic analyses of the nature and experiences of poverty and marginality in Latin America and in the United States. Examines some of the most controversial issues and debates, and explores emerging research topics north and south of the border. May be counted toward the sociology department's political sociology, development and globalization specialization in the sociology degree program. Only one of the following may be counted: Latin American Studies 381 (Topic: Poverty and Marginality in the Americas), 381 (Topic 23), Sociology 395D (Topic: Poverty and Marginality in the Americas), 396P (Topic 17).

### **LAS 382. Conference Course in Latin American Studies.**

Individual study to be arranged with a faculty member. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **LAS 384. Proseminar: Current Issues in Latin America.**

Three lecture hours a week for one semester. Latin American Studies 381 (Topic: Proseminar: Latin America in the Twentieth Century) and 384 may not both be counted. Prerequisite: Graduate standing in Latin American studies.

### **LAS 384L. Topics in Latin American Politics.**

A varied selection of topics each semester, taught by different faculty members and visiting professors. Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 1: Brazilian Public Policies.** Same as Government 384L (Topic 1: Brazilian Public Policies). Three lecture hours a week for one semester. Additional prerequisite: Twenty-four semester hours of coursework in government or related fields and consent of the graduate adviser. Some reading knowledge of Spanish or Portuguese is recommended.

**Topic 2: Latin American Urban Politics.** Same as Government 384L (Topic 2: Latin American Urban Politics). Three lecture hours a week for one semester. Additional prerequisite: Twenty-four semester hours of coursework in government or related fields and consent of the graduate adviser. Some reading knowledge of Spanish or Portuguese is recommended.

**Topic 3: Development Policy.** Same as Government 384M (Topic 6: Development Policy). Three lecture hours a week for one semester.

Additional prerequisite: Twenty-four semester hours of coursework in government or related fields and consent of the graduate adviser.

**Topic 4: Policy Analysis.** Same as Government 384M (Topic 2: Policy Analysis). Study of the nature and operation of the national policymaking process. Three lecture hours a week for one semester. Additional prerequisite: Twenty-four semester hours of coursework in government or related fields and consent of the graduate adviser.

**Topic 5: Politics and Society in the Third World.** Same as Government 390L (Topic 15: Politics and Society in the Third World). Three lecture hours a week for one semester. Additional prerequisite: Twenty-four semester hours of coursework in government or related fields and consent of the graduate adviser.

**Topic 6: Comparative Politics: Latin America.** Same as Government 390L (Topic 18: Comparative Politics: Latin America). Three lecture hours a week for one semester. Additional prerequisite: Twenty-four semester hours of coursework in government or related fields and consent of the graduate adviser.

### **LAS 386. Topics in Latin American History.**

A varied selection of topics each semester, to allow curriculum flexibility for faculty members and visiting scholars. Three lecture hours a week for one semester. May be repeated for credit when the topics vary.

Prerequisite: Graduate standing; additional prerequisites vary with the topic.

### **LAS 388. Topics in Latin American Geography.**

Three lecture hours a week for one semester. Latin American Studies 381 and 388 may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Regional Geography of Latin America.** Same as Geography 385 (Topic 1: Latin America). Topics include land and life in Central America; culture, environment and development in Latin America; recent trends in Latin American geography. Additional prerequisite: Consent of instructor.

**Topic 2: Indigenous Maps, Architecture, and Enculturation of Colonial Mexico.** Same as Geography 388C. The encounter of Spanish and indigenous cultures and ecologies; regional diversity of agricultural, urban, and economic development from 1521 to 1810; ethnic transformation and new socioeconomic configurations.

**Topic 3: Latin American Cultures, Environment, and Development.** Same as Geography 395D. Exploration through Latin American examples of issues of cultural identity and territory, adaptive strategies, environmental impact, conservation, cultural survival, parks and people, and sustainable development. Additional prerequisite: Consent of instructor.

**Topic 4: Environment and Health in Latin America.** Same as Geography 380D. Issues related to health, health care, and development in Latin America and the Caribbean, considered with the recognition that health depends on the interactions of social, economic, and political factors as well as on health care services.

### **LAS 391. Topics in Latin American Anthropology.**

A varied selection of topics each semester, taught by different faculty members and visiting professors. Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 5: Race and Ethnicity in American Society.** Same as Anthropology 389K (Topic 19: Race and Ethnicity in American Society).

### **LAS 391K. Topics in Latin American Economics.**

A varied selection of topics each semester, taught by different faculty members and visiting professors. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 1: Seminar on the Mexican Economy.** Additional prerequisite: Six semester hours of upper-division coursework in economics and six additional semester hours of upper-division coursework in social science or business.

**Topic 2: Current Issues in Latin American Economics.** Only one of the following may be counted: Economics 391K (Topic 2), Latin American Studies 391K (Topic: Current Economic Issues in Latin America), 391K (Topic 2). Additional prerequisite: Six semester hours of upper-division coursework in economics and six additional semester hours of upper-division coursework in social science or business.

**Topic 3: Latin American Economic Models.** Additional prerequisite: Six semester hours of upper-division coursework in economics and six additional semester hours of upper-division coursework in social science or business.

**Topic 4: Entrepreneurship and Development in Latin America.** Additional prerequisite: Six semester hours of upper-division coursework in economics and six additional semester hours of upper-division coursework in social science or business.

### **LAS 392P. Topics in Luso-Brazilian Literature, Culture, Civilization, and Linguistics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

### **LAS 392S. Topics in Hispanic Literature, Culture, Civilization, and Linguistics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

### **LAS 397R. Secondary Report.**

Preparation of a report to be counted toward the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing in Latin American studies and consent of the supervising professor and the graduate adviser.

### **LAS 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in Latin American studies and consent of the supervising professor and the graduate adviser; for 698B, Latin American Studies 698A.

### **LAS 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in Latin American studies and consent of the supervising professor and the graduate adviser.

### **LAS 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

## LAS 399W, 699W, 999W. Dissertation.

Offered on the credit/no credit basis only. Prerequisite: Latin American Studies 399R, 699R, or 999R.

# Linguistics

*Master of Arts  
Doctor of Philosophy*

## For More Information

**Campus address:** College of Liberal Arts Building (CLA) 4.304, phone (512) 471-1701, fax (512) 471-4340; campus mail code: B5100

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Linguistics, 305 East 23rd Street Stop B5100, Austin TX 78712

**URL:** <http://www.utexas.edu/cola/depts/linguistics/>

## Facilities for Graduate Work

The University Libraries have extensive collections in linguistics and related fields, in major world and regional languages, and in minority and indigenous languages. The Benson Latin American Collection houses a major archive of materials on or in indigenous and colonial languages of Latin America. The Archive of the Indigenous Languages of Latin America (<http://www.ailla.utexas.org/site/welcome.html>) (AILLA) is a digital archive of original sound recordings and related documentary resources on indigenous languages of Latin America that is curated on campus.

Members of the department maintain cutting-edge laboratories for research in phonetics, computational linguistics, language acquisition, descriptive and documentary linguistics, and signed language linguistics. The facilities of Information Technology Services are among the most comprehensive at American universities.

The principal areas of study within the department (phonology and phonetics, syntax and semantics, descriptive and documentary linguistics, linguistics of signed languages, and computational linguistics) maintain active student-faculty research groups which sponsor colloquia, conferences, or reading groups. The department also sponsors a general linguistics colloquium with outside and on-campus speakers. Conferences (<http://www.utexas.edu/cola/depts/linguistics/events/conferences/about.php>) include the biennial Conference on Indigenous Languages of Latin America and two annual student-run conferences, the Texas Linguistics Society conference and the Symposium about Language and Society—Austin (SALSA).

The Department of Linguistics has close links, including cross-listed faculty members and courses, to such adjacent fields as anthropology, computer science, communication sciences and disorders, philosophy, psychology, Slavic and Eurasian studies, English, Germanic studies, Middle Eastern studies, French and Italian, and Spanish and Portuguese, as well as area studies such as Asian studies and Latin American studies.

## Areas of Study

The Department of Linguistics offers a thorough foundation in phonetics, phonology, syntax, and semantics; it also offers strong grounding in computational linguistics, documentary and descriptive linguistics and endangered languages, language acquisition, and signed language linguistics, and neurolinguistics. The faculty aims to give students broad training in linguistics alongside their eventual specialization in one or more subfields.

A student's Program of Work in linguistics may be combined with supporting work in other areas such as specific languages, anthropology,

computer science, philosophy, psychology, statistics, or communication sciences and disorders.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Jason M Baldrige	Daniel A Law
Colin James Bannard	Richard P Meier
David I Beaver	Scott P Myers
John T Beavers	David G Quinto-Pozos
Megan J Crowhurst	Rajka Smiljanic
Nora C England	Harvey M Sussman
Patience L Epps	Stephen M Wechsler
Katrin E Erk	Anthony C Woodbury
Ian F Hancock	

## Admission Requirements

Admission to graduate work is not necessarily restricted to those who have a Bachelor of Arts degree with a major in linguistics, although this background is recommended. A number of other fields can also provide valuable preparation.

## Degree Requirements

### Master of Arts

Candidates for the master's degree must complete thirty-six semester hours of coursework and submit a thesis or report for approval by a supervising committee.

The following coursework is required. A course used to fulfill requirement 1 or 2 may not also be used to fulfill requirement 3.

1. Linguistics 380K, 380L, 380M, 381M, and 385.
2. Six additional hours of research equivalencies (Linguistics 381K, 381L, 389, 389C, 389D, 389P, 389S, 389V, 395, any advanced course or non-core area course) in the primary area of interest.
3. Six hours in a minor area.
4. Linguistics 398R or 698.
5. The remaining six hours of coursework for the report option, or remaining three semester hours for the thesis option, must be fulfilled by courses approved by the graduate adviser.

The department has no formal language requirement, but the faculty recommends that students have or acquire some familiarity with at least one language other than their native language.

### Doctor of Philosophy

Candidates for the doctoral degree in linguistics must complete the following courses: Linguistics 380K, 380L, 380M, 381M, 385, and 397. The student must also complete six hours of supporting coursework in a minor area. Students should plan to take at least one research equivalency (Linguistics 381K, 381L, 389, 389C, 389D, 389P, 389S, 389V, 395, any advanced course or non-core area course, including approved courses in other departments) each semester during the first three years. The minor area and research equivalency courses form a core part of the Program of Work which must be approved by the graduate adviser. The remaining twelve hours of coursework must be fulfilled by courses approved by the graduate adviser.

The department has no formal language requirement, but the faculty recommends that students have or acquire some familiarity with at least one language other than their native language.

**Admission to candidacy.** To qualify for admission to candidacy for the doctoral degree, a student must complete fifty-four semester hours approved for the Program of Work; complete first and second year research papers approved for the requirement by the graduate adviser; submit a qualifying paper for approval by a faculty committee; and complete a paper in a minor area approved for the requirement by the faculty member reviewing the paper. The first or second year research papers may be used for the minor area paper if written in the minor area and approved by an appropriate faculty member.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Linguistics: LIN

#### LIN 380K. Phonology I.

The descriptive techniques of generative phonology. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### LIN 380L. Syntax I.

An introduction to the description and analysis of syntax. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### LIN 380M. Semantics I.

An introduction to formal semantics and pragmatics, and the logical techniques needed to analyze them. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### LIN 380S. Sociolinguistics.

An introduction to sociolinguistic research, with attention to theoretical issues. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Linguistics 380K and 380L.

#### LIN 381K. Phonology II.

Readings and problems in current phonological theory. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Linguistics 380K.

#### LIN 381L. Syntax II.

Advanced description and analysis of syntax. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Linguistics 380L.

#### LIN 381M. Phonetics.

Speech production and perception; acoustic phonetics; phonetics and phonology; experimental techniques. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### LIN 381S. Semantics II.

Continuation of Linguistics 380M. Descriptive methods and theoretical tools for investigating meaning in human languages; an introduction to propositional content and speech acts. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Linguistics 380L and 380M.

#### LIN 382. Historical Linguistics.

The principles of language change, reconstruction of earlier linguistic stages, language contact, and language relatedness. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Linguistics 380K.

#### LIN 383. Comparative and Diachronic Linguistics.

The comparative method; applications to particular linguistic families. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 3: Introduction to Romance Linguistics.** Same as French 396K (Topic 1: Introduction to Romance Linguistics), Italian 396K (Topic 1: Introduction to Romance Linguistics), Portuguese 396K (Topic 2: Introduction to Romance Linguistics), and Spanish 396K (Topic 2: Introduction to Romance Linguistics). Additional prerequisite: Graduate standing in languages and consent of instructor and the graduate adviser.

**Topic 6: History of the Arabic Language.** Same as Arabic 382C (Topic 4: History of the Arabic Language). Additional prerequisite: Arabic 420L (or 320L).

**Topic 8: Introduction to Diachronic Linguistics: Germanic.** Same as Classical Civilization 383 (Topic 2) and German 381 (Topic 3). Only one of the following may be counted: Anthropology 393 (Topic 16), Classical Civilizations 383 (Topic 2), German 381 (Topic 3), Linguistics 383 (Topic 8).

#### LIN 384. Language Structures.

Languages studied have included Chatino, German, Mayan, Romance languages, and others. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and twelve semester hours of upper-division coursework in linguistics.

**Topic 4: German Syntax.** Same as German 393K (Topic 1: German Syntax).

#### LIN 385. Field Methods in Linguistic Investigation.

Methods of research in phonological and grammatical description; work with speakers of under-described languages. Three lecture hours and one laboratory hour a week for one semester, with additional field hours to be arranged. Prerequisite: Graduate standing and consent of instructor.

#### LIN 386M. Mathematical and Computational Linguistics.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 2: Computational Linguistics I.**

**Topic 3: Computational Linguistics II.**

**Topic 4: Computational Linguistics III: Advanced Parsing.**

#### LIN 387. Linguistics and Language Teaching.

Same as Curriculum and Instruction 385G (Topic 6: Linguistics and Language Teaching). Designed primarily for participants in international education exchange programs. Application of the findings of linguistics to the teaching of languages. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### LIN 389. Linguistic Research.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.



**LIN 389C. Research in Computational Linguistics.**

Three lecture hours a week for one semester. May be repeated for credit.  
Prerequisite: Graduate standing.

**LIN 389D. Research in Documentary and Descriptive Linguistics.**

Three lecture hours a week for one semester. May be repeated for credit.  
Prerequisite: Graduate standing.

**LIN 389P. Research in Phonetics and Phonology.**

Three lecture hours a week for one semester. May be repeated for credit.  
Prerequisite: Graduate standing.

**LIN 389S. Research in Syntax and Semantics.**

Three lecture hours a week for one semester. May be repeated for credit.  
Prerequisite: Graduate standing.

**LIN 389V. Research in Signed Languages.**

Three lecture hours a week for one semester. May be repeated for credit.  
Prerequisite: Graduate standing.

**LIN 391. Topics in Descriptive Linguistics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 2: Studies in English Grammar.** Additional prerequisite: Consent of instructor.

**LIN 392. Current Developments in Linguistic Research.**

A reading course in a selected area of linguistics. Three lecture hours a week for one semester. May be repeated for credit when the topics vary.  
Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Introduction to Cognitive Science.** Same as Cognitive Science 380 (Topic 1: Introduction to Cognitive Science), Philosophy 383C, and Psychology 394U (Topic 3: Introduction to Cognitive Science). Only one of the following may be counted: Cognitive Science 380 (Topic 1), Linguistics 392 (Topic 1), 393 (Topic: Introduction to Cognitive Science), 393 (Topic: Topics in Cognitive Science), Philosophy 383 (Topic: Introduction to Cognitive Science), 383C, Psychology 394U (Topic 3).

**Topic 2: Tools for Linguistic Description.** Basic tools for analyzing and describing a language through linguistic fieldwork, including phonetic transcription, the discovery and presentation of surface phonology, morphophonology, inflectional morphology, derivational morphology, grammatical categories, and syntax.

**Topic 3: Linguistic Typology.** An introduction to the typological study of language: the investigation into the nature of human language, as informed by systematic cross-linguistic comparison.

**LIN 393. Seminar in Linguistic Topics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 4: Neurolinguistics.**

**Topic 6: Speech Play and Verbal Art.**

**Topic 8: Linguistics of Signed Languages.**

**LIN 393C. Language Acquisition.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**LIN 393P. Topics in Phonology and Phonetics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**LIN 393S. Topics in Syntax and Semantics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**LIN 394K. Philosophy of Language.**

Same as Philosophy 394K. Three lecture hours a week for one semester. Only one of the following may be counted: Linguistics 393S (Topic: Philosophy of Language), 394K, Philosophy 391 (Topic: Philosophy of Language), 394K. Prerequisite: Graduate standing and consent of instructor.

**LIN 395. Conference Course in Linguistics.**

Supervised research. Conference course. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor and the linguistics graduate adviser.

**LIN 396. Topics in Sociolinguistics.**

Detailed investigation of an area of current interest in sociolinguistics. Most topics provide an opportunity for field research. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 2: Introduction to Graduate Linguistic Anthropology.** Same as Anthropology 392N. Prerequisite: Graduate standing and consent of instructor.

**Topic 3: Ethnography of Speaking.** Same as Anthropology 393 (Topic 8: Ethnography of Speaking). Additional prerequisite: Consent of instructor.

**Topic 4: Turkic Cultures and Languages in Central Asia.** Same as Middle Eastern Studies 381 (Topic 26: Turkic Cultures and Languages in Central Asia). Additional prerequisite: Consent of instructor.

**Topic 7: Grammar of the Arabic Language.** Same as Arabic 382C (Topic 2: Grammar of the Arabic Language). Additional prerequisite: Arabic 420L (or 320L).

**LIN 397. Forum for Doctoral Candidates.**

Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in linguistics and consent of instructor.

**LIN 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in linguistics and consent of the graduate adviser; for 698B, Linguistics 698A.

**LIN 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in linguistics and consent of the graduate adviser.

**LIN 398T. Supervised Teaching in Linguistics.**

Teaching under the close supervision of the course instructor; weekly group meetings with instructor, individual consultations, and reports throughout the teaching period. Three lecture hours a week for one

semester. Prerequisite: Graduate standing and appointment as a teaching assistant.

### **LIN 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **LIN 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Linguistics 399R, 699R, or 999R.

## **Medieval Studies**

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### **Medieval Studies: MDV**

#### **MDV 385L, 685L. Conference Course on Special Topics.**

Conference course. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

#### **MDV 392L. Readings in Medieval Latin.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

#### **MDV 392M, 692M. Seminar in Medieval Culture.**

Major medieval historical developments and monuments of culture in thought, literature, art, architecture, and music. For 392M, three lecture hours a week for one semester; for 692M, six lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

#### **MDV 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and consent of the graduate adviser.

#### **MDV 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Medieval Studies 399R, 699R, or 999R, and consent of the graduate adviser.

## **Mexican American and Latina/o Studies**

*Master of Arts*

### **For More Information**

**Campus address:** West Mall Office Building (WMB) 5.102, phone (512) 471-4557, fax (512) 471-9639; campus mail code: F9200

**Mailing address:** The University of Texas at Austin, Graduate Adviser, Center for Mexican American Studies, 306 Inner Campus Drive Stop F9200, Austin TX 78712

**E-mail:** [nvs@austin.utexas.edu](mailto:nvs@austin.utexas.edu)

**URL:** <https://www.utexas.edu/cola/depts/mals/graduate/introduction.php>

## **Facilities for Graduate Work**

The Department of Mexican American and Latina/o Studies is the first department of its kind in the nation. In addition to the expertise of the faculty, graduate students have access to the extensive resources of the Nettie Lee Benson Latin American Collection, the Mexican American Library Program, and the Harry Ransom Center. The University's central Texas location also provides opportunities for field research within the growing Mexican American population across the Southwest, and for research in Mexico as well.

## **Areas of Study**

Mexican American and Latina/o studies has emerged as a significant area of scholarship over the last four decades. The University has been at the forefront of this area under the leadership of faculty members such as George I. Sánchez, Carlos E. Castañeda, and the founder of the Center for Mexican American Studies, Américo Paredes. These scholars helped to define the discipline of Mexican American studies as academic work carried out from the perspective of the Mexican American and Latina/o experiences. This work should raise new questions, formulate and explore new theories, and carry out empirical research that expands the understanding of a variety of fields, including social science, history, the humanities and arts, education, public and social policy, and the sciences. The objective of the master's degree program in Mexican American and Latina/o studies is to prepare students for professional careers in which advanced knowledge about Mexican American and Latina/o cultural practices, historical development, and socioeconomic conditions is crucial. In addition, graduates are prepared to pursue doctoral work in ethnic studies or a related discipline.

## **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Ricardo C Ainslie	Martha Menchaca
Cecilia Balli	Julie A Minich
Mary C Beltran	Robin D Moore
Charles E Berg	Yolanda C Padilla
Norma V Cantu	Deborah A Paredes
Oscar H Casares	Domino R Perez
Juan J Colomina-Alminana	Manuel Ramirez III
Cary Cordova	Pedro Reyes
James H Cox	Maggie R Rodriguez
George F Flaherty	Nestor P Rodriguez
Richard R Flores	Victor B Saenz
Thomas J Garza	Roxanne Schroeder-Arce
John M Gonzalez	Cherise Smith
Gloria Gonzalez-Lopez	Joseph Straubhaar
Kenneth F Greene	Luis Urrieta
Nicole Marie Guidotti-Hernandez	Fred Valdez Jr
Frank A Guridy	Richard Valencia
David L Leal	Angela Valenzuela
Raul L Madrid	Emilio Zamora
Ramon Antonio Martinez	

## **Admission Requirements**

Applicants must meet the minimum requirements for graduate study at the University. An admissions committee composed of Graduate Studies Committee members in Mexican American and Latina/o studies also evaluates applications, giving preference to candidates who demonstrate a strong academic background and a clear sense of the areas they wish to pursue through the master's degree program.

# Degree Requirements

Students pursuing the Master of Arts degree may choose one of two plans: Plan A, which requires thirty-three semester hours of coursework, including a thesis, or Plan B, which requires thirty-three semester hours of coursework, including two reports. Checklists for both plans can be found on the Department of Mexican American and Latina/o Studies Web site (<http://www.utexas.edu/cola/depts/mals>). Students in both plans must complete a foundational seminar, Mexican American Studies 390.

Students pursuing Plan A must complete fifteen semester hours of graduate coursework in a major concentration and nine hours in a minor concentration. They must also complete Mexican American Studies 698.

Students pursuing Plan B must complete fifteen semester hours of graduate coursework in a major concentration and nine hours in a minor concentration. They must also complete Mexican American Studies 397R and 398R.

Before completing the program, all students must demonstrate competence in written and/or oral Spanish by means approved by the Graduate Studies Committee.

Students must designate a major in one of two specific course concentrations and a minor in the other: cultural studies and policy studies. Students will organize the courses they take within these concentrations to satisfy either Plan A or Plan B. These course concentrations reflect the intellectual breadth and depth of the department's faculty affiliates through their research and teaching interests and the graduate courses offered in past semesters.

Students are allowed on a case-by-case basis to develop their own course concentrations to satisfy either the Plan A or Plan B requirements in consultation with the graduate adviser or program coordinator.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Mexican American Studies: MAS

#### MAS 382. Conference Course in Mexican American Studies.

Conference course. May be repeated for credit. Prerequisite: Graduate standing and consent of the graduate adviser.

#### MAS 390. Introduction to Mexican American Studies.

An overview of Mexican American studies for graduate research. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### MAS 392. Topics in Mexican American Studies.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser. Additional prerequisites vary with the topic and are given in the Course Schedule.

#### MAS 395. Grammar and Composition for Native and Heritage Speakers.

Designed to help students develop graduate-level academic writing and oral expression skills in Spanish. Intensive training in formal

communication. Three lecture hours a week for one semester.

Prerequisite: Graduate standing and consent of the graduate adviser.

#### MAS 397R. Secondary Report.

Preparation of a report to be counted toward the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in Mexican American studies and consent of the graduate adviser.

#### MAS 698. Thesis.

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in Mexican American studies and consent of the graduate adviser; for 698B, Mexican American Studies 698A.

#### MAS 398R. Master's Report.

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in Mexican American studies and consent of instructor.

#### MAS 398T. Supervised Teaching in Mexican American Studies.

Methods of teaching in Mexican American studies. Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

## Middle Eastern Studies

*Master of Arts (in Middle Eastern Studies)*

*Master of Arts (in Middle Eastern Languages and Cultures)*

*Doctor of Philosophy (in Middle Eastern Languages and Cultures)*

The Center for Middle Eastern Studies administers the master's degree in Middle Eastern studies. The Department of Middle Eastern Studies administers the master's and doctoral degree programs in Middle Eastern languages and cultures.

### For More Information

**Campus address:** Calhoun Hall (CAL) 520, phone (512) 471-3881, fax (512) 471-7834; campus mail code: F9400

**Mailing address:** The University of Texas at Austin, Graduate Program, Middle Eastern Studies, 204 W 21st Street Stop F9400, Austin TX 78712

**E-mail:** [mes-gradprogram@austin.utexas.edu](mailto:mes-gradprogram@austin.utexas.edu)

**URL:** <http://www.utexas.edu/cola/depts/mes/>

### Facilities for Graduate Work

University library holdings on the Middle East form one of the leading collections in North America. These include 150,000 volumes and 1,230 serial titles in Arabic, Hebrew, Persian, Turkish, Kurdish, Tajiki, and Azerbaijani, and more than 160,500 volumes in Western languages. This collection includes a comprehensive set of English-language reference works, general texts, basic monographs, and essential journals on the Middle East. Among the special collections are strong holdings on Shi'ism, Islamic jurisprudence, and Arabic and Persian literature; a set of Arabic manuscripts on the Yezidis of Yemen; a virtually complete set of Turkish and Azerbaijani periodicals that forms a unique national resource; and more than 2,000 volumes of census records on Middle Eastern countries. The University Libraries has the largest collection of South African Jewish materials in the United States, both in *belles lettres* and in periodicals. Electronic material supporting Middle Eastern

studies is also extensive and includes electronic databases such as JSTOR and ATLA; the Perry-Castañeda digitized map collection; the *Encyclopedia of Islam*; *Records on Islam: Primary Documents*; *The Encyclopaedia Judaica*; and the Judaic Classics Library. The department has also donated to the main library a collection of approximately four thousand English-language books and reference works, some ten thousand digitized slides, and hundreds of films and periodicals. The Harry Ransom Center holds writers' personal papers, including those of T. E. Lawrence, Paul Bowles, Freya Stark, Richard Burton, and others with a special Middle Eastern connection. The Ransom Center has significant holdings relating to Judaica, including the Isaac Bashevis Singer Archive, the Leon Uris Archive, and a portion of the literary archive of Bernard Malamud. The Dolph Briscoe Center for American History holds the Development Communication Archive, donated by the federal Agency for International Development, which consists of more than 350 linear feet of original records on issues ranging from agriculture and the environment to health and community development; about a quarter of the documents cover Middle Eastern projects. University faculty members and students also have access to vast centralized resources such as the Center for Research Libraries in Chicago and the Yale University-sponsored OACIS project.

## Areas of Study

The Center for Middle Eastern Studies offers the Master of Arts with a major in Middle Eastern studies, an interdisciplinary degree with a regional concentration on the Middle East. Many students in this program enter careers in academia, business, communication, government, global policy studies, public affairs, information studies, law, and the military. There is a good deal of flexibility in meeting degree requirements; each student, in consultation with the graduate adviser, designs an individual program within the framework of the requirements described in Degree Requirements (p. 284). Students interested in an academic career in a single discipline, with a concentration on the Middle East, should contact the graduate program for that discipline; for example, the student may select a concentration in the Middle East, but major in anthropology, art history, business, classics, comparative literature, economics, geography, government, history, linguistics, or sociology.

The Department of Middle Eastern Studies offers master's and doctoral degrees in Middle Eastern languages and cultures. Students at the master's level may concentrate in teaching Arabic as a foreign language (TAFL). At the doctoral level, students select a field of study from among the following: linguistics (theoretical linguistics or language pedagogy), literatures/cultures, Hebrew Bible/ancient Near East, or Islamic studies.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Ari Adut  
 Kamran S Aghaie  
 Mahmoud M Al-Batal  
 Kamran Ali  
 Samer M Ali  
 Blake R Atwood  
 Germine H Awad  
 Hina Azam  
 Zoltan D Barany  
 Benjamin C Brower  
 Jason M Brownlee  
 Kristen Brustad  
 Mounira M Charrad  
 Yoav Di-Capua  
 Rasha Diab  
 David J Eaton  
 Tarek Adnan El-Ariss  
 Mohammad Ghanoonparvar  
 Kate Gillespie  
 Karen Grumberg  
 Jo Ann Hackett  
 Barbara J Harlow  
 Geraldine Heng

John Huehnergard  
 Syed A Hyder  
 Jonathan Kaplan  
 William R Louis  
 Sofian Merabet  
 Gail Minault  
 Mohammad A Mohammad  
 A Azfar Moin  
 Fehintola A Mosadomi  
 Stephennie Mulder  
 Mary C Neuburger  
 Thomas G Palaima  
 Athanasio Papalexandrou  
 Na'ama Pat-El  
 Glenn A Peers  
 Esther L Raizen  
 Sonia T Seeman  
 Faegheh S Shirazi  
 Denise A Spellberg  
 Jeremi Suri  
 Helene Tissieres  
 Alexander A Weinreb  
 Karin G Wilkins

## Admission Requirements

### Master of Arts

**Middle Eastern studies.** The entering student must have a bachelor's degree from an accredited college or university. While the Center admits students holding a variety of undergraduate degrees, previous academic work on the region and some proficiency in one of its languages is recommended.

**Middle Eastern languages and cultures.** Admission to the program with a focus in teaching Arabic as a foreign language (TAFL) requires a bachelor's degree from an accredited college or university and advanced proficiency in Arabic, including one spoken dialect.

### Doctor of Philosophy

**Middle Eastern languages and cultures.** Because scholarship in Middle Eastern languages and cultures requires a high degree of language proficiency, students normally complete a Master of Arts in the area of concentration before acceptance into the PhD program. In exceptional cases, the Graduate Admissions Committee may take extensive study outside of a master's program into account. For students specializing in a living language tradition, advanced proficiency in the language of concentration is required. Students focusing on the ancient Near East must have three years of biblical Hebrew (including study of biblical Aramaic), one year of a second ancient Semitic language, and either a second year of the same ancient Semitic language or proficiency in German, as well as background in the study of the Hebrew Bible.

## Degree Requirements

### Master of Arts

#### Middle Eastern Studies

This program consists of at least thirty semester hours, including a six-semester-hour thesis; or at least thirty-three semester hours, including a three-semester-hour report. With the exception of Middle Eastern Studies 698A, 698B, and 398R, all courses must be taken on the letter-grade basis. For the thirty-semester-hours thesis option, students complete eighteen semester hours of Middle Eastern studies coursework, six semester hours of non-Middle Eastern studies minor area coursework,

and six semester hours of thesis. For the thirty-three-semester-hours report option, students complete twenty-one semester hours of Middle Eastern studies coursework, nine semester hours of non-Middle Eastern studies minor area coursework, and three semester hours of report.

For administrative purposes, a coursework option is available to dual-degree students who are required by their other graduate program to take the 698A and 698B courses, or 398R course, so that the student does not need to complete two theses, two reports, or one thesis/one report. In such cases, a Center for Middle Eastern Studies Graduate Studies Committee member must still serve as either the supervisor, co-supervisor, or second reader.

**Language requirement (six semester hour minimum):** The student must complete either two upper-division or graduate-level courses in one modern Middle Eastern language while enrolled in the degree program. These two courses shall be applied to the Middle Eastern studies major area coursework requirement. Students who are native speakers of a Middle Eastern language must complete these courses in a different modern Middle Eastern language.

All students are expected to maintain a minimum 3.50 grade point average in order to remain in good standing. Failure to maintain this minimum average will result in a warning letter and one semester of probation, during which time the student is expected to return to a minimum 3.50 grade point average. The program has the discretion to dismiss students who are unable to meet this requirement after one additional semester.

## Middle Eastern Languages and Cultures

Both the thesis and report options require thirty semester hours of coursework, which is to be chosen in consultation with the student's supervisor or the graduate adviser. The thesis option requires at least twenty-four semester hours of coursework, to be taken on a letter-grade basis, and six semester hours (Middle Eastern Studies 698A and 698B) of thesis coursework culminating in an approved thesis. The report option requires twenty-seven semester hours of coursework, to be taken on a letter-grade basis, and three semester hours (Middle Eastern Studies 398R) of report coursework culminating in an approved report. The report option will most commonly take the form of an applied pedagogy project or publishable article.

All students are expected to maintain a minimum 3.50 grade point average in order to remain in good standing. Failure to maintain this minimum average will result in a warning letter and one semester of probation, during which time the student is expected to return to a minimum 3.50 average. The program has the discretion to dismiss students who are unable to meet this requirement after one additional semester.

## Doctor of Philosophy

The program is designed to increase the breadth and depth of the student's knowledge and to develop his or her capacity for independent scholarly research. The courses required are determined by the student's interests in consultation with the doctoral supervisor.

## Middle Eastern Languages and Cultures

The aim of the program is to educate and mentor scholars and teachers of the languages and cultures of the Middle East with the depth to support a sustained research career and the breadth to teach a range of courses on Middle Eastern topics. Students learn to design and execute research projects that will help redefine the frontiers of discovery in their field. Teaching experience helps prepare them to communicate new knowledge to experts and nonexperts alike.

In applying to the program, students select an area of study from among the following: linguistics (theoretical linguistics or language pedagogy), literatures/cultures, Hebrew Bible/ancient Near East, or Islamic studies. Through the course of their studies, they develop methodological expertise in at least one of the following areas: textual analysis, literary theory, linguistic theory, or cultural theory. During their first year, incoming students choose or are assigned a faculty mentor with whom they plan to work in their major field. This mentor oversees the student's selection of courses for registration and the design of his or her course of study. Students are also encouraged to seek the advice of other faculty members in the program on their studies and their progress.

Students must develop a mastery of at least one major Middle Eastern language and must demonstrate scholarly research skills and potential. A period of study abroad in the region of specialization is strongly recommended for students of living languages. Study of a second Middle Eastern language is strongly encouraged, and competency in a research language is required. Doctoral candidates are also expected to present papers at academic or professional conferences before graduation.

PhD students normally take three years of coursework beyond the master's degree. Before taking the comprehensive examinations, each student must demonstrate, through formal testing, proficiency in the language required by his or her major field. Reading knowledge in one research language (typically German or French) is required and must be demonstrated by passing a reading test administered by the department.

To be admitted to candidacy for the degree, the student must pass comprehensive written and oral examinations. The purpose of the examinations is to certify that the student has sufficient knowledge for an academic career, and has the skills and abilities required to complete a doctoral dissertation. Examinations are normally taken during the third or fourth year of the program.

After passing these examinations, the candidate sets up a dissertation committee with the help of his or her supervisor. This committee approves the dissertation prospectus as a prerequisite to candidacy, guides the student in writing and revising the dissertation, and administers the final oral dissertation defense.

All students are expected to maintain a minimum 3.50 grade point average in order to remain in good standing. Failure to maintain this minimum average will result in a warning letter and one semester of probation, during which time the student is expected to return to a minimum 3.50 grade point average. The program has the discretion to dismiss students who are unable to meet this requirement after one additional semester.

## Dual Degree Programs

The Center for Middle Eastern Studies offers the following dual degree programs in cooperation with other divisions of the University. More information is available from the graduate adviser in each program.

Field(s) of Study	Degree(s)
Business administration	Master of Business Administration
Global policy studies	Master of Global Policy Studies
Information studies	Master of Science in Information Studies
Journalism	Master of Arts
Law	Doctor of Jurisprudence
Public affairs	Master of Public Affairs
Radio-television-film	Master of Arts

# Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## Arabic: ARA

### ARA 380C. Topics in Arabic Language.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and Arabic 420L (or 320L). Additional prerequisites may vary with the topic and are given in the Course Schedule.

**Topic 8: Translating Arabic Texts.** Same as Middle Eastern Studies 381 (Topic 39: Translating Arabic Texts). Only one of the following may be counted: Arabic 360L (Topic 4: Translating Arabic Texts), 380C (Topic 8), Middle Eastern Studies 381 (Topic 39).

### ARA 381H. Intensive Graduate Language Instruction I.

Not open to native speakers of Arabic. Intensive cultural and literacy-focused training in Arabic at the beginning level in preparation for research in the Arab world or with Arabic sources. Incoming students are placed in the appropriate level by means of a departmental placement test. Six lecture hours a week for one semester. Prerequisite: Graduate standing.

### ARA 381J. Intensive Graduate Language Instruction II.

Not open to native speakers of Arabic. Intensive cultural and literacy-focused training in Arabic at the low-intermediate level in preparation for research in the Arab world or with Arabic sources. Incoming students are placed in the appropriate level by means of a departmental placement test. Six lecture hours a week for one semester. Prerequisite: Graduate standing and Arabic 381H with a grade of at least B.

### ARA 381K. Intensive Graduate Language Instruction III.

Not open to native speakers of Arabic. Intensive cultural and literacy-focused training in Arabic at the intermediate level in preparation for research in the Arab world or with Arabic sources. Incoming students are placed in the appropriate level by means of a departmental placement test. Six lecture hours a week for one semester. Prerequisite: Graduate standing and Arabic 381J with a grade of at least B.

### ARA 381L. Intensive Graduate Language Instruction IV.

Not open to native speakers of Arabic. Intensive cultural and literacy-focused training in Arabic at the high-intermediate level in preparation for research in the Arab world or with Arabic sources. Incoming students are placed in the appropriate level by means of a departmental placement test. Six lecture hours a week for one semester. Prerequisite: Graduate standing and Arabic 381K with a grade of at least B.

### ARA 381M. Intensive Graduate Language Instruction V.

Not open to native speakers of Arabic. Intensive cultural and literacy-focused training in Arabic at the advanced level in preparation for research in the Arab world or with Arabic sources. Incoming students are placed in the appropriate level by means of a departmental placement test. Five lecture hours a week for one semester. Prerequisite: Graduate standing and Arabic 381L with a grade of at least B.

### ARA 381N. Intensive Graduate Language Instruction VI.

Not open to native speakers of Arabic. Intensive cultural and literacy-focused training in Arabic at the advanced level in preparation for research in the Arab world or with Arabic sources. Incoming students are placed in the appropriate level by means of a departmental placement test. Five lecture hours a week for one semester. Prerequisite: Graduate standing and Arabic 381M with a grade of at least B.

### ARA 382C. Topics in Arabic Linguistics and Philology.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and Arabic 420L (or 320L) or 531L with a grade of at least B. Additional prerequisites may vary with the topic.

**Topic 2: Grammar of the Arabic Language.** Same as Linguistics 396 (Topic 7: Grammar of the Arabic Language).

**Topic 3: Arab Grammarians.**

**Topic 4: History of the Arabic Language.** Same as Linguistics 383 (Topic 6: History of the Arabic Language).

**Topic 5: The Qur'an: A Linguistic Analysis.**

**Topic 6: Varieties and Registers of Arabic.** The historical and linguistic development of Arabic varieties and registers, past and present. Arabic 383C (Topic: Varieties and Registers of Arabic) and 382C (Topic 6) may not both be counted.

**Topic 7: Comparative Arabic Dialects.** Additional prerequisite: Some familiarity with an Arabic dialect.

**Topic 8: Introduction to Arabic Linguistics.** Introduction to the major areas of research in Arabic linguistics. Includes formal linguistics and sociolinguistics, and code-switching and dialectology.

**Topic 9: The Structure of Palestinian Arabic.** A detailed examination of the syntax of Palestinian Arabic. Additional prerequisite: A graduate course in Arabic grammar or theoretical syntax.

### ARA 383C. Topics in Arabic Language Teaching, Pedagogy, and Applied Linguistics.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and Arabic 420L (or 320L) or 531L with a grade of at least B. Additional prerequisites may vary with the topic.

**Topic 1: Teaching Arabic as a Foreign Language.** Theory and practice of foreign or second language acquisition, applied to Arabic instruction. Arabic 380C (Topic: Teaching Arabic as a Foreign Language) and 383C (Topic 1) may not both be counted.

**Topic 3: Curriculum Design in Arabic.** Examines three curricular models that are widely used in teaching foreign languages: proficiency-based instruction, task-based instruction, and content-based instruction. Additional prerequisite: Arabic 383C (Topic 1).

### ARA 384C. Topics in Arabic Literature.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and Arabic 420L (or 320L) or 531L with a grade of at least B; additional prerequisites vary with the topic.

**Topic 2: Politics of Court Literature.** Same as Middle Eastern Studies 386 (Topic 4: Politics of Court Literature). Only one of the following may be counted: Arabic 384C (Topic 2), Middle Eastern Studies 381 (Topic 45: Politics of Court Literature), Middle Eastern Studies 386 (Topic 4).

**Topic 5: Arab Women Poets.**

**Topic 6: Classical Arabic Akhbar.** Examines classical Arabic prose from the perspective of the individual khabar or story, which was the basic unit for all humanities works, and works in history, geography, zoology, cosmology, and anthropology.

**Topic 7: Arab Culture in Sicily from 652 to 1189.** Arabic 384C (Topic 7) and 387 (Topic: Arab Culture in Sicily from 652 to 1189) may not both be counted.

**Topic 8: Refiguring Loss in Contemporary Arabic Literature.** Explores literary lamentations describing Arab dispossession and humiliation following military and ideological defeats in the second half of the twentieth century.

**Topic 9: New Arabic Writings.**

**Topic 10: Encountering the West in Modern Arabic Literature.** Investigates the representation of the West in Arabic literature from the nineteenth century onward by examining travel narratives, novels, essays, and visual texts.

**Topic 11: Survey of Classical Arabic Literature.** Additional prerequisite: Consent of instructor.

**Topic 12: Survey of Modern Arabic Literature.** Additional prerequisite: Consent of instructor.

### **ARA 386K. Advanced Spoken Media Arabic I.**

Development of the specialized vocabulary and skills needed in the media and public policy sectors of the Arab-speaking world. Three lecture hours a week for one semester. Arabic 380C (Topic: Advanced Spoken Media Arabic I) and 386K may not both be counted. Prerequisite: Graduate standing.

### **ARA 386L. Advanced Spoken Media Arabic II.**

Development of the specialized vocabulary and skills needed in the media and public policy sectors of the Arab-speaking world. Three lecture hours a week for one semester. Arabic 380C (Topic: Advanced Spoken Media Arabic II) and 386L may not both be counted. Prerequisite: Graduate standing and Arabic 386K.

### **ARA 387. Topics in Arab Culture.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and Arabic 420L (or 320L) or 531L with a grade of at least B. Additional prerequisites may vary with the topic.

**Topic 1: Contemporary Arabic Cinema.**

### **ARA 388. Research Methods and Bibliography in Arabic Studies.**

Arabic classical and modern sources on a variety of subjects, as well as modern scholarship in Arabic studies both in the West and in the Arab world. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Arabic 420L (or 320L) or 531L with a grade of at least B. Additional prerequisites may vary with the topic.

### **ARA 389. Conference Course in Arabic Studies.**

Supervised individual study of selected problems in Arabic studies. Conference course. May be repeated for credit. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **ARA 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in Arabic studies and consent of the graduate adviser; for 698B, Arabic 698A.

### **ARA 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in Arabic studies and consent of the graduate adviser.

### **ARA 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **ARA 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Arabic 399R, 699R, or 999R.

## **Hebrew: HEB**

### **HEB 380C. Topics in Hebrew Language.**

Taught in English. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 2: Advanced Readings in Modern Hebrew.**

**Topic 5: Mishnaic Hebrew/Talmud Aramaic.**

**Topic 8: Biblical Hebrew.**

### **HEB 381H. Intensive Graduate Language Instruction I.**

Intensive cultural and literacy-focused training in Hebrew at the beginning level in preparation for research with Hebrew sources. Incoming students are placed in the appropriate level by means of a departmental placement test. Six lecture hours a week for one semester. Prerequisite: Graduate standing.

### **HEB 381J. Intensive Graduate Language Instruction II.**

Intensive cultural and literacy-focused training in Hebrew at the intermediate level in preparation for research with Hebrew sources. Incoming students are placed in the appropriate level by means of a departmental placement test. Six lecture hours a week for one semester. Prerequisite: Graduate standing and Hebrew 381H with a grade of at least B.

### **HEB 381K. Intensive Biblical Language Instruction I.**

Introduction to biblical Hebrew, including basic lexicon and grammar, with an emphasis on reading the Hebrew Bible. Six lecture hours a week for one semester. Prerequisite: Graduate standing.

### **HEB 381L. Intensive Biblical Language Instruction II.**

Builds on material covered in Hebrew 602C. A thorough study of biblical Hebrew grammar, with emphasis on the verb system and the rules of sentence structure. Selected texts include biblical chapters of a poetic, legal, and prophetic nature. Six lecture hours a week for one semester. Prerequisite: Graduate standing.

### **HEB 381M. Hebrew Via Popular Culture.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing and Hebrew 381J or the equivalent with a grade of at least C.

### **HEB 381N. Hebrew Through the Media.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing and Hebrew 381M or the equivalent with a grade of at least C.

### **HEB 384C. Topics in Hebrew Literature.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 2: Contemporary Israeli Fiction.**

**Topic 3: Mizrahi Writing in Israel.**

### **HEB 385. Hebrew Literature in Translation and Israeli Media.**

Study of selected works of Hebrew literature in English translation and Israeli film and television programs with English subtitles. Three lecture hours a week for one semester; additional hours may be required for some topics. May be repeated for credit when the topics vary, but no more than six hours may be counted toward the Master of Arts or the Doctor of

Philosophy in Hebrew studies. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Post-Zionist Perspectives in Israeli Literature.** Israeli literature through the context of the historical, cultural, and artistic movement known as post-Zionism.

**Topic 2: The Book of Job: Text and Language.** Hebrew 380C (Topic: The Book of Job: Text and Language) and 385 (Topic 2) may not both be counted.

**Topic 3: Dead Sea Scrolls: Language and Literature.**

**Topic 4: Ethnic and Social Israeli Cinema.**

### **HEB 389. Conference Course in Hebrew Studies.**

Supervised individual study of selected problems in Hebrew studies. Conference course. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **HEB 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in Hebrew studies and consent of the graduate adviser; for 698B, Hebrew 698A.

### **HEB 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **HEB 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Hebrew 399R, 699R, or 999R.

## **Middle Eastern Languages and Cultures: MEL**

### **MEL 380. Topics in Middle Eastern Cultures.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

### **MEL 380C. Topics in Middle Eastern Languages.**

Advanced studies in Middle Eastern languages. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites may vary with the topic.

**Topic 1: Targumic Aramaic.** Examines Aramaic translations of the Hebrew bible that contain many exegetical deviations from the Hebrew text, and provide a glimpse of Jewish theology at the time of their composition. Hebrew 380C (Topic 6: Targumic Aramaic) and Middle Eastern Languages 380C (Topic 1) may not both be counted. Additional prerequisite: Consent of instructor; some knowledge of Hebrew is recommended.

**Topic 2: Syriac.** Study of the eastern Aramaic dialect that was spoken in the ancient Near East until the Muslim occupation. Examines the use of the dialect as a vehicle for Christianity in the East; its use in poetry, science, and philosophy; and its influence on Arabic. Covers the essentials of Syriac grammar for the purpose of reading Syriac texts. Hebrew 380C (Topic 9: Syriac) and Middle Eastern Languages and Cultures 380C (Topic 2) may not both be counted. Additional prerequisite: Consent of instructor.

**Topic 3: Classical Ethiopic.** Study of the fourth-century language of the Semitic people who lived in what is now Ethiopia and Eritrea. Covers the alphabet and grammar needed for reading translations of the Bible and other texts. Hebrew 380C (Topic 10: Classical Ethiopic) and MEL 380C (Topic 3) may not both be counted. Additional prerequisite: Consent of instructor.

**Topic 4: Ugaritic.** Study of the West Semitic languages from the city of Ugarit in what is now Syria, which was spoken from the fourteenth through twelfth century BC. Covers the essentials of grammar needed for reading Ugaritic texts. HEB 380C (Topic 11: Ugaritic) and MEL 380C (Topic 4) may not both be counted. Additional prerequisite: Consent of instructor.

### **MEL 381. Topics in Middle Eastern Literatures.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

### **MEL 382. Topics in Middle Eastern Linguistics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 1: Teaching Middle Eastern Languages.** Additional prerequisite: Graduate standing and consent of instructor.

**Topic 2: Introduction to the Structure of Semitic Languages.** Covers the grammatical structure of a number of ancient and modern Semitic languages (such as Akkadian, Biblical Hebrew, Ethiopic, and Modern Aramaic) and of the family of languages as a whole. Hebrew 380C (Topic 12: Introduction to the Structure of Semitic Languages) and MEL 382 (Topic 2) may not both be counted. Additional prerequisite: Graduate standing and consent of instructor.

### **MEL 383. Topics in the Ancient Near East.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 1: Hebrew Bible Doctoral Seminar I.** Three lecture hours a week for one semester. Hebrew 380C (Topic: Hebrew Bible Doctoral Seminar I) and Middle Eastern Languages and Cultures 383 (Topic 1) may not both be counted. Additional prerequisite: Graduate standing and consent of instructor.

**Topic 2: Hebrew Bible Doctoral Seminar II.** Three lecture hours a week for one semester. HEB 380C (Topic: Hebrew Bible Doctoral Seminar II) and Middle Eastern Languages and Cultures 383 (Topic 2) may not both be counted. Additional prerequisite: Graduate standing and consent of instructor.

**Topic 3: Hebrew Bible Doctoral Seminar III.** Only one of the following may be counted: Jewish Studies 383 (Topic: Hebrew Bible Doctoral Seminar III), Middle Eastern Languages and Cultures 383 (Topic: Hebrew Bible Doctoral Seminar III), 383 (Topic 3), Religious Studies 386H (Topic: Hebrew Bible Doctoral Seminar III). Additional prerequisite: Consent of instructor.

**Topic 4: Hebrew Bible Doctoral Seminar IV.** Three lecture hours a week for one semester. Only one of the following may be counted: Middle Eastern Languages and Cultures 383 (Topic: Hebrew Bible Doctoral Seminar IV) 383 (Topic 4), Religious Studies 386H (Topic: Hebrew Bible Doctoral Seminar IV). Additional prerequisite: Consent of instructor.

### **MEL 389. Conference Course in Middle Eastern Languages and Cultures.**

Supervised individual study of selected problems in Middle Eastern languages and cultures. The equivalent of three lectures a week for one semester. May be repeated for credit. Prerequisite: Graduate standing, consent of the instructor and graduate adviser.



### **MEL 393. Comprehensive Examination Preparation.**

The equivalent of three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, and consent of the instructor and graduate adviser.

### **MEL 194, 294, 394. Professional Development in Middle Eastern Languages and Cultures.**

For each semester hour of credit earned, one lecture hour a week for one semester. May be repeated for credit. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **MEL 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in Middle Eastern languages and cultures and consent of the graduate adviser; for 698B, Middle Eastern Languages and Cultures 698A.

### **MEL 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in Middle Eastern languages and cultures and consent of the graduate adviser.

### **MEL 398T. Supervised Teaching in Middle Eastern Languages and Cultures.**

Teaching under the close supervision of a faculty member; weekly group meetings with the instructor, individual consultation, and reports throughout the teaching period. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **MEL 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **MEL 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Middle Eastern languages and cultures 399R, 699R, or 999R

## **Middle Eastern Studies: MES**

### **MES 380. International Business Fellows Seminar.**

Same as Asian Studies 391 (Topic 6: International Business Fellows Seminar); Latin American Studies 381 (Topic 8: International Business Fellows Seminar); and Russian, East European, and Eurasian Studies 380. Multidisciplinary seminar for students in area studies, business administration, law, and public policy. The faculty includes both academics and business leaders. Three lecture hours a week for one semester. Only one of the following may be counted: Asian Studies 391 (Topic 6), International Business 395 (Topic: International Business Fellows Seminar), Latin American Studies 381 (Topic 8), Middle Eastern Studies 380, Public Affairs 388K (Topic: International Business Fellows Seminar), Russian, East European, and Eurasian Studies 380. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **MES 381. Seminar in Middle Eastern Civilizations and Cultures.**

Advanced studies of various aspects of the civilizations and cultures of the Middle East and North Africa. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 11: Regional Geography of the Middle East and North Africa.** Same as Geography 385 (Topic 5: The Middle East and North

Africa). Topics include developmental activity and spatial change in the Middle East, comparative regional studies.

**Topic 18: Ottoman Egypt and Syria, 1516-1918.** Same as History 388K (Topic 1: Ottoman Egypt and Syria, 1516-1918).

**Topic 20: Shamanism in Central Asia.**

**Topic 22: Politics of the Middle East and North Africa.** Same as Government 390L (Topic 4: Politics of the Middle East and North Africa). Readings and research on the political systems of the Arab world, Israel, Turkey, Iran, and Afghanistan. Precise topics vary. Additional prerequisite: Twenty-four semester hours of coursework in government or related fields, and consent of the graduate adviser.

**Topic 26: Turkic Cultures and Languages in Central Asia.** Same as Linguistics 396 (Topic 4: Turkic Cultures and Languages in Central Asia). Additional prerequisite: Consent of instructor.

**Topic 28: Iranian Literature in Exile.** Same as Persian 384C (Topic 8: Iranian Literature in Exile). Additional prerequisite: Three semester hours of upper-division coursework in Persian and consent of instructor.

**Topic 29: Environment and Development in the Middle East.** Same as Geography 383C (Topic 2: Environment and Development in the Middle East).

**Topic 30: Language and Politics in Language Planning.** Same as Curriculum and Instruction 385G (Topic 7: Language and Politics in Language Planning). Additional prerequisite: Consent of instructor.

**Topic 31: Mapping the Middle East.** Same as Geography 381C.

Ways in which the Middle East is and has been represented cartographically. Cartographic representations of the region during the fifteenth and sixteenth centuries; the nature and evolution of a distinctive Islamic cartographic tradition; the role and use of maps during the nineteenth and twentieth centuries both in the extension of colonialism and in the creation of modern states; and the contemporary use, applications, and implications of geographic information systems in organizing and representing data spatially. Additional prerequisite: Consent of instructor.

**Topic 32: The Jordan River Basin after the Peace Agreements.** Additional prerequisite: Consent of instructor.

**Topic 33: Translation: Theory, History, and Practice.** Additional prerequisite: Consent of instructor.

**Topic 37: Intellectual History of Indo-Iranian Islam.** Same as Asian Studies 390 (Topic 6: Intellectual History of Indo-Iranian Islam) and History 388K (Topic 2: Intellectual History of Indo-Iranian Islam).

**Topic 38: Music Cultures of the Middle East: Past and Present.**

**Topic 39: Translating Arabic Texts.** Same as Arabic 380C (Topic 8: Translating Arabic Texts). Only one of the following may be counted: Arabic 360L (Topic 4: Translating Arabic Texts), 380C (Topic 8), Middle Eastern Studies 381 (Topic 39).

**Topic 41: Gender, Clothing, and Identity in Muslim Society.**

### **MES 382. Conference Course.**

Individual research on various aspects, periods, civilizations, and cultures of the Middle East and North Africa. The equivalent of three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **MES 383. Internships in Applied Middle Eastern Studies.**

Students conduct research and participate in other work in an appropriate agency or business. At least nine but no more than twelve hours of fieldwork a week for one semester. May not be repeated for credit. Prerequisite: Graduate standing and consent of the graduate adviser.

### **MES 384. Topics in the Middle East: Social Science.**

Advanced studies of various aspects of social sciences in the Middle East. Three lecture hours a week for one semester. Only one of the following may be counted unless the topics vary: Middle Eastern Studies 381, 384, 385, 386, 390, 392. May be repeated for credit when the topics vary.

Additional prerequisite: Graduate standing, and consent of the instructor and graduate advisor.

**Topic 1: Business in Emerging Markets.** Same as Latin American Studies 381 (Topic 21: Business in Emerging Markets). Only one of the following may be counted: Latin American Studies 381 (Topic: Business in Developing Countries), 381 (Topic 21), Middle Eastern Studies 381 (Topic: Business in Developing Countries), 381 (Topic 36: Business in Emerging Markets), 384 (Topic 1).

**Topic 2: Development Communication.** Same as Latin American Studies 381 (Topic 17). Only one of the following may be counted: Asian Studies 391 (Topic 2: Development Communication), Latin American Studies 381 (Topic 17), Middle Eastern Studies 381 (Topic 34: Development Communication), 384 (Topic 2), Radio-Television-Film 387D (Topic: Development Communication). Additional prerequisite: Consent of instructor and the graduate advisor.

**Topic 6: Cities and Citizenship.**

**Topic 7: Culture, History, and Power.**

**Topic 8: Gender and Development.**

**Topic 9: International Journalism Crisis Coverage.**

**Topic 10: The Military in Politics.**

**Topic 11: Nationalism and Gender.**

### MES 385. Topics in the Middle East: History.

Advanced studies of various aspects of history in the Middle East. Three lecture hours a week for one semester. Only one of the following may be counted unless the topics vary: Middle Eastern Studies 381, 384, 385, 386, 390, 392. May be repeated for credit when the topics vary. Prerequisite: Graduate standing. Additional prerequisites may vary with the topic.

**Topic 3: Islamic Historiography.** Middle Eastern Studies 385 (Topic 3) and 390 (Topic 1: Islamic Historiography) may not both be counted.

**Topic 4: Islamic Revolution of Iran.** Additional prerequisite: Consent of instructor.

**Topic 5: Modern Iranian History and Historiography.** Middle Eastern Studies 381 (Topic 44: Modern Iranian History and Historiography) and Middle Eastern Studies 385 (Topic 5) may not both be counted.

**Topic 6: Shi'ite Religious and Political Ideologies.**

**Topic 7: Women in Islamic Societies.** Same as Asian Studies 391 (Topic 7: Women in Islamic Societies) and History 382N (Topic 2: Women in Islamic Societies). Only one of the following may be counted: Asian Studies 391 (Topic 7), History 382N (Topic 2), Middle Eastern Studies 385 (Topic 7).

**Topic 8: The Colonial Situation in Algeria and Beyond.**

**Topic 9: Method and Theory in Middle Eastern Studies.**

**Topic 10: Modern Arab Renaissance: An Inquiry.**

**Topic 11: State and Society in the Middle East.**

**Topic 12: European Imperialism: British Empire.** Same as Asian Studies 391 (Topic 3) and History 380L (Topic 1). Study of the British empire in the Middle East, Asia and Africa. Only one of the following may be counted: Asian Studies 391 (Topic 3), History 380L (Topic 1), Middle Eastern Languages and Cultures 381 (Topic 12: European Imperialism: British Empire), 385 (Topic 12). Additional prerequisite: Graduate standing.

### MES 386. Topics in the Middle East: Arts and Humanities.

Advanced studies of various aspects of the arts and humanities in the Middle East. Three lecture hours a week for one semester. Only one of the following may be counted unless the topics vary: Middle Eastern Studies 381, 384, 385, 386, 390, 392. May be repeated for credit when the topics vary. Prerequisite: Graduate standing. Additional prerequisites may vary with the topic.

**Topic 2: Iranian Film and Fiction.** Same as Persian 384C (Topic 10: Iranian Film and Fiction). Only one of the following may be counted: Middle Eastern Studies 381 (Topic 7: Iranian Film and Fiction), 386 (Topic 2), Persian 361 (Topic 5: Iranian Film and Fiction), 384C (Topic 10).

**Topic 4: Politics of Court Literature.** Same as Arabic 384C (Topic 2: Politics of Court Literature). Only one of the following may be counted: Arabic 384C (Topic 2), Middle Eastern Studies 381 (Topic 45: Politics of Court Literature), Middle Eastern Studies 386 (Topic 4). Prerequisite: Graduate standing, and Arabic 420L (or 320L) or 531L with a grade of at least B. Additional prerequisites may vary with the topic.

**Topic 5: Theory and Practice in Literary Translation.** Middle Eastern Studies 381 (Topic 40: Theory and Practice of Literary Translation) and Middle Eastern Studies 386 (Topic 5) may not both be counted.

**Topic 7: Arab Women Poets.**

**Topic 8: Arabo-Islamic Ode.**

**Topic 9: Classical Arabic Ahkbar.**

**Topic 10: Holy War Redux.**

**Topic 11: Islamic Ornament.**

**Topic 12: Islamic Studies: Disciplinary Introduction.**

**Topic 13: Loyalty and Rebellion in Arabic Literature.**

**Topic 14: Mizrahi Writing in Israel.**

**Topic 15: Post-Zionist Perspectives in Israeli Literature.**

**Topic 16: Readings in Contemporary Persian Political Writings.**

**Topic 17: Refiguring Loss in Contemporary Arabic Literature.**

**Topic 18: Seminar in Music, Gender, and Sexuality.**

**Topic 19: Women in Scripture.**

**Topic 20: Lebanon: Formation and Transformation.**

### MES 194, 294, 394. Professional Development in Middle Eastern Studies.

For each semester hour of credit earned, one lecture hour a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, and consent of instructor and the graduate advisor.

### MES 698. Thesis.

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in Middle Eastern studies and consent of the graduate adviser; for 698B, Middle Eastern Studies 698A.

### MES 398R. Master's Report.

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in Middle Eastern studies and consent of the graduate adviser.

### MES 398T. Supervised Teaching in Middle Eastern Studies.

Teaching under the close supervision of a faculty member; weekly group meetings with the instructor, individual consultation, and reports throughout the teaching period. Three lecture hours a week for one semester. Prerequisite: Graduate standing and appointment as a teaching assistant or assistant instructor.

## Persian: PRS

### PRS 380C. Topics in Persian Language.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and six semester hours of upper-division coursework in Persian or consent of instructor.

### **PRS 381H. Intensive Graduate Language Instruction I.**

Intensive cultural and literacy-focused training in Persian at the beginning level in preparation for research with Persian sources. Includes an independent project component. Incoming students are placed in the appropriate level by means of a departmental placement test. Six lecture hours a week for one semester. Prerequisite: Graduate standing.

### **PRS 381J. Intensive Graduate Language Instruction II.**

Intensive cultural and literacy-focused training in Persian at the low-intermediate level in preparation for research with Persian sources. Incoming students are placed in the appropriate level by means of a departmental placement test. Six lecture hours a week for one semester. Prerequisite: Graduate standing and Persian 381H with a grade of at least B.

### **PRS 381K. Intermediate Graduate Language Instruction I.**

Intensive cultural and literacy-focused training in Persian at the intermediate level in preparation for research with Persian sources. Includes an independent project component. Incoming students are placed in the appropriate level by means of a departmental placement test. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Persian 381J with a grade of at least B.

### **PRS 381L. Intermediate Graduate Language Instruction II.**

Intensive cultural and literacy-focused training in Persian at the high-intermediate level in preparation for research with Persian sources. Includes an independent project component. Incoming students are placed in the appropriate level by means of a departmental placement test. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Persian 381K with a grade of at least B.

### **PRS 382C. Topics in Persian Linguistics and Philology.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in Persian studies.

### **PRS 384C. Topics in Persian Literature.**

Study of various aspects and periods of Persian language and literature. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, three semester hours of upper-division coursework in Persian, and consent of instructor.

**Topic 1: Ferdowsi's Shahnameh.**

**Topic 2: Sa'di's Golestan.**

**Topic 3: Hafez and Classical Persian Lyric Poetry.**

**Topic 4: Sadeq Hedayat and Twentieth-Century Persian Prose Fiction.**

**Topic 5: Forugh Farrokhzad and Modernist Persian Poetry.**

**Topic 6: Iranian Women Writers.**

**Topic 7: Persian Prose Nonfiction, Past and Present.**

**Topic 8: Iranian Literature in Exile.** Same as Middle Eastern Studies 381 (Topic 28: Iranian Literature in Exile).

**Topic 9: Iranian Drama.**

**Topic 10: Iranian Film and Fiction.** Same as Middle Eastern Studies 386 (Topic 2: Iranian Film and Fiction). Only one of the following may be counted: Middle Eastern Studies 381 (Topic 7: Iranian Film and Fiction), 386 (Topic 2), Persian 361 (Topic 5: Iranian Film and Fiction), 384C (Topic 10).

### **PRS 389. Conference Course in Persian Studies.**

Supervised individual study of selected problems in Persian studies. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing, consent of the graduate adviser, and consent of instructor.

### **PRS 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in Persian studies and consent of the graduate adviser; for 698B, Persian 698A.

### **PRS 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in Persian studies and consent of the graduate adviser.

### **PRS 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **PRS 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Persian 399R, 699R, or 999R.

## **Turkish: TUR**

### **TUR 380. Topics in Turkish Language and Literature.**

Study of various aspects or eras of Turkish language and literature. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and Turkish 412L or the equivalent.

### **TUR 381H. Intensive Graduate Language Instruction I.**

Intensive cultural and literacy-focused training in Turkish at the beginning level in preparation for research in the Turkic-speaking world or with Turkish sources. Incoming students are placed in the appropriate level by means of a departmental placement test. Six lecture hours a week for one semester. Prerequisite: Graduate standing.

### **TUR 381J. Intensive Graduate Language Instruction II.**

Intensive cultural and literacy-focused training in Turkish at the low-intermediate level in preparation for research in the Turkic-speaking world or with Turkish sources. Incoming students are placed in the appropriate level by means of a departmental placement test. Six lecture hours a week for one semester. Prerequisite: Graduate standing and Turkish 381H with a grade of at least B.

### **TUR 381K. Intermediate Graduate Language Instruction I.**

Intensive cultural and literacy-focused training in Turkish at the intermediate level in preparation for research in the Turkic-speaking world or with Turkish sources. Includes an independent project component. Incoming students are placed in the appropriate level by means of a departmental placement test. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Turkish 381J with a grade of at least B.

### **TUR 381L. Intermediate Graduate Language Instruction II.**

Intensive cultural and literacy-focused training in Turkish at the high-intermediate level in preparation for research in the Turkic-speaking world or with Turkish sources. Includes an independent project component. Incoming students are placed in the appropriate level by means of a placement test. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Turkish 381K with a grade of at least B.

### **TUR 381M. Advanced Language Instruction I.**

Restricted to non-native speakers of Turkish. Intensive cultural and literacy-focused training in Turkish at the advanced level in preparation

for research in the Turkic-speaking world or with Turkish sources. Incoming students are placed in the appropriate level by means of a departmental placement test. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Turkish 381L or the equivalent with a grade of at least C.

### **TUR 381N. Advanced Language Instruction II.**

Restricted to non-native speakers of Turkish. Intensive cultural and literacy-focused training in Turkish at the advanced level in preparation for research in the Turkic-speaking world or with Turkish sources. Incoming students are placed in the appropriate level by means of a departmental placement test. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Turkish 381M or the equivalent with a grade of at least C.

### **TUR 382. Topics in Turkish Culture.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

### **TUR 389. Conference Course in Turkish Studies.**

Supervised individual study of selected problems in Turkish studies. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing, consent of the graduate adviser, and consent of instructor.

### **TUR 390K. Advanced Turkish I.**

Intermediate to high-level Turkish in four basic language skills: speaking, listening, reading, and writing. Turkish culture. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Turkish 412L or the equivalent.

### **TUR 390L. Advanced Turkish II.**

Continuation of Turkish 390K. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Turkish 390K or the equivalent.

## **Philosophy**

*Master of Arts  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Waggener Hall (WAG) 329, phone (512) 471-6093, fax (512) 471-4806; campus mail code: C3500

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Philosophy, 2210 Speedway Stop C3500, Austin TX 78712

**E-mail:** [graduatephilosophy@austin.utexas.edu](mailto:graduatephilosophy@austin.utexas.edu)

**URL:** <http://www.utexas.edu/cola/depts/philosophy/>

### **Areas of Study**

The Department of Philosophy offers areas of concentration across the discipline and offers special programs in cooperation with other departments: (1) ancient philosophy, with the Department of Classics; (2) history and philosophy of science, with the Department of History; and (3) philosophy and cognitive science, with the Departments of Linguistics, Psychology, and Computer Science. For descriptions of these programs, students should consult the graduate adviser.

## **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

David I Beaver	Michelle Montague
Daniel A Bonevac	Alexander Mourelatos
Lawrence R Buchanan	Adam Pautz
J Budziszewski	Stephen H Phillips
Jonathan Dancy	Ian N Proops
John Deigh	Richard M Sainsbury
Joshua Dever	Sahotra Sarkar
Sinan Dogramaci	Miriam Schoenfield
Katherine Laura Dunlop	Thomas K Seung
Matthew L Evans	Tara A Smith
Robert J Hankinson	David Sosa
Kathleen M Higgins	Galen Strawson
Cory F Juhl	Michael Tye
Robert C Koons	Stephen A White
Jon E Litland	Paul B Woodruff
Aloysius P Martinich	

## **Degree Requirements**

### **Master of Arts**

The master's degree program with report requires completion of Philosophy 384F and 398R, twenty-seven additional semester hours of graduate coursework in philosophy, or twenty-one additional semester hours of graduate coursework in philosophy and six hours of upper-division or graduate coursework in a supporting subject. The master's degree program with thesis requires completion of thirty hours of graduate coursework in philosophy, or twenty-four hours of graduate coursework in philosophy including Philosophy 698 and six hours of upper-division or graduate coursework in a supporting subject.

### **Doctor of Philosophy**

In addition to the general requirements given in Degree Requirements (p. 20), the requirements for the doctoral degree are as follows:

1. Philosophy 384F and 389, completed in the first year of graduate study.
2. A graduate course in each of the following: history of philosophy (any period up to or including Kant), metaphysics and epistemology, and ethics.
3. Philosophy 398T, a one-semester teaching internship.
4. Five additional graduate courses in philosophy.
5. Proficiency in a language other than English, or two additional graduate seminars in philosophy, or two additional upper-division or graduate seminars in a related area approved by the Graduate Studies Committee chair. Proficiency in a foreign language may be shown by completion of four semesters of coursework, or the equivalent, either before or after admission to the program.
6. Completion and defense of a dissertation prospectus, by the end of the third year.
7. Completion and defense of a dissertation.

## **Graduate Courses**

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also

reflect changes made to the course inventory after the publication of this catalog.

## **Philosophy: PHL**

### **PHL 380. Contemporary Philosophy.**

Past topics include pragmatism; postmodernism; contemporary Marxism; critical theory. Three hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **PHL 381. History of Philosophy.**

Past topics include major figures and movements in ancient, medieval, early modern, and nineteenth- and twentieth-century philosophy. Three hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **PHL 382. Metaphysics.**

Past topics include basic issues in metaphysics; particulars and universals; identity and individuation; realism and antirealism; mind-body issues. Three hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **PHL 383. Theory of Knowledge.**

Past topics include basic issues in epistemology; theories of belief and rationality; justification and truth. Three hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **PHL 383C. Introduction to Cognitive Science.**

Same as Cognitive Science 380 (Topic 1: Introduction to Cognitive Science), Linguistics 392 (Topic 1: Introduction to Cognitive Science), and Psychology 394U (Topic 3: Introduction to Cognitive Science). Three lecture hours a week for one semester. Only one of the following may be counted: Cognitive Science 380 (Topic 1), Linguistics 392 (Topic 1), 393 (Topic: Introduction to Cognitive Science), 393 (Topic: Topics in Cognitive Science), Philosophy 383 (Topic: Introduction to Cognitive Science), 383C, Psychology 394U (Topic 3). Prerequisite: Graduate standing.

### **PHL 384F. First-Year Seminar.**

Central problems in philosophy. Three lecture hours a week for one semester. Prerequisite: Graduate standing in philosophy, or graduate standing and consent of the graduate adviser.

### **PHL 384K. The Analytic Tradition.**

A selective examination of works by major figures such as Frege, Moore, Russell, and Wittgenstein. Three hours a week for one semester. Prerequisite: Graduate standing.

### **PHL 385. Theory of Value.**

Past topics include basic issues in value theory; the objectivity of value; literature and philosophy; philosophy of art; literary criticism. Three hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **PHL 386. Philosophy of Science.**

Past topics include basic issues in the philosophy of science; theories and explanations; philosophy of quantum mechanics; philosophy of the social sciences. Three hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **PHL 387. Ethical, Political, and Legal Philosophy.**

Past topics include contemporary ethical theory; theories of justice; philosophy of law; social contract theories; political philosophy. Three hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **PHL 188, 388. Conference Course.**

Mainly a reading course in the works of classical and modern philosophers. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of the graduate adviser.

### **PHL 388C. Prospectus Course.**

Mainly a reading course for development of a dissertation prospectus. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### **PHL 389. Logic.**

Rigorous definitions of syntax and semantics. Proofs of soundness and completeness of sentential and predicate logics; other topics in metatheory. May include extensions of and alternatives to classical logic. Philosophical significance of logic and metalogical results. Three hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **PHL 391. Logic and Philosophy.**

Past topics include identity and substitutivity; philosophy of logic; discourse representation. Three hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **PHL 394K. Philosophy of Language.**

Same as Linguistics 394K. Three lecture hours a week for one semester. Only one of the following may be counted: Linguistics 393S (Topic: Philosophy of Language), 394K, Philosophy 391 (Topic: Philosophy of Language), 394K. Prerequisite: Graduate standing and consent of instructor.

### **PHL 396W. Dissertation Seminar.**

Restricted to doctoral students in philosophy. Intensive examination of selected dissertation topics: attention to research methods, presentation, structure, and argument. Student reports on current research. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### **PHL 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. For 698A, graduate standing in philosophy, twelve semester hours of upper-division or graduate coursework in philosophy, and consent of the graduate adviser; for 698B, Philosophy 698A.

### **PHL 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in philosophy and consent of the graduate adviser.

### **PHL 398T. Supervised Teaching in Philosophy.**

Teaching experience developed through an apprentice relationship between student and faculty member. Three hours a week for one semester. Students may register for this course as many as four times,

but only three semester hours of credit in this course may be applied toward a graduate degree. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

#### **PHL 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

#### **PHL 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Philosophy 399R, 699R, or 999R.

## Psychology

*Master of Arts  
Doctor of Philosophy*

### For More Information

**Campus address:** Sarah M. and Charles E. Seay Building (SEA) 3.210, phone (512) 471-6398, fax (512) 471-6175; campus mail code: A8000

**Mailing address:** The University of Texas at Austin, Department of Psychology, Graduate Program, 108 East Dean Keeton A8000, Austin TX 78712

**Email:** psygradoffice@austin.utexas.edu

**URL:** <http://www.utexas.edu/cola/depts/psychology/>

### Facilities for Graduate Work

The Department of Psychology is located in the Sarah M. and Charles E. Seay Building. State-of-the-art computer networking is integrated into the building; there are computer facilities, computerized laboratories, and technological support for students and faculty members. Laboratory facilities include environmental control of sound, light, and temperature, with vibration-free areas for auditory and vision research. A number of specialized research centers are located in the building, including the Children's Research Laboratory, the Center for Perceptual Systems, the Center for Cognitive Science, the Laboratory for the Study of Anxiety Disorders, the Female Sexual Psychophysiology Laboratory, and the Clinical Training Clinic.

Graduate students and faculty members in the Department of Psychology participate in research programs with graduate students and faculty members in the Department of Human Development and Family Sciences, also housed in the Seay Building, and in many other fields, including biological sciences, communication, computer science, educational psychology, kinesiology, linguistics, pharmacy, and sociology. The Hogg Foundation for Mental Health and the Waggoner Center for Alcohol and Addiction Research provide additional collaborative opportunities.

### Areas of Study

Graduate work is offered in the following areas of specialization: behavioral neuroscience; cognitive neuroscience; cognitive science; perception, brain, and behavior; clinical psychology; developmental psychology; individual differences and evolutionary psychology; and social and personality psychology. Students are admitted for graduate work in one of these areas. Students in any of these areas may also complete a neuroimaging track in psychology. The program in clinical psychology has been approved by the Commission on Accreditation of the American Psychological Association.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Dana H Ballard	Charles J Holahan
Jennifer S Beer	Alexander C Huk
Christopher G Beevers	Jody Jensen
Rebecca Bigler	Theresa A Jones
Amy Elizabeth Booth	Robert A Josephs
David M Buss	Judith H Langlois
Caryn L Carlson	Hongjoo J Lee
Jessica A Church-Lang	Cristine H Legare
Lawrence K Cormack	Marc S Lewis
David P Crews	Jarrold Alan Lewis-Peacock
Yvon Delville	W T Maddox
Randy L Diehl	Arthur B Markman
Andrew P Dillon	Richard P Meier
Juan M Dominguez	Cindy M Meston
Michael P Domjan	Marie H Monfils
Michael Drew	Ian Michael Nauhaus
Christine L Duvauchelle	A Rebecca Neal-Beevers
Catharine H Echols	James W Pennebaker
Kim Fromme	Steven M Phelps
Bertram Gawronski	Alison R Preston
Wilson S Geisler III	Manuel Ramirez III
David L Gilden	Timothy J Schallert
Rueben A Gonzales	David M Schnyer
F Gonzalez-Lima	Eyal Seidemann
Andrea C Gore	Jasper A Smits
Samuel D Gosling	David W Springer
Zenzi M Griffin	William B Swann Jr
Andreana P Haley	Michael J Telch
Kathryn Paige Harden	Elliot Max Tucker-Drob
Mary M Hayhoe	Jacqueline D Woolley
Marlone D Henderson	David Scott Yeager
Carole K Holahan	

## Degree Requirements

### Master of Arts

The psychology graduate program is designed primarily to lead to the degree of Doctor of Philosophy. Students intending to earn the doctoral degree may enroll for the Master of Arts with special permission. The department's requirements for the Master of Arts include Psychology 384M, *Advanced Statistics: Inferential*; one course from two of the core content groups (the core content groups are available on the Department of Psychology Web site (<http://www.utexas.edu/cola/depts/psychology/graduate/phd.php>)); and fulfillment of the general requirements of the Graduate School. A thesis is required.

### Doctor of Philosophy

Graduate training in the Department of Psychology is flexible and every effort is made to permit students to take courses that fit their own interests and goals. Thus, individual students may engage in considerable work in computer sciences, biology, sociology, mathematics, or other fields. All graduate students must complete at least two advanced statistics courses, one to be taken during the first year, and three core courses from at least two of the following core content groups: (1) behavioral neuroscience/psychopharmacology; (2) cognitive/perceptual systems; (3) social/developmental/clinical/evolutionary psychology. One core course must be taken the first year; the remaining requirements must be fulfilled during the first three years.

Students are formally evaluated by the entire faculty at the end of the first year. This evaluation is based on the student's performance in the first-year core courses and other coursework, demonstration of research aptitude, and, when appropriate, potential for professional competence. In subsequent years, students are expected to demonstrate competence in their area of specialization, develop research skills, and, when appropriate, develop professional skills. Each of the areas has established criteria for evaluating student performance.

The department's general requirements for the doctoral degree include completion of the core courses and other appropriate courses, completion of area requirements, and preliminary and final oral examinations related to a dissertation that gives evidence of the student's ability to carry out independent investigation in the major field. Clinical students are also expected to complete an internship and to demonstrate ultimate suitability for the practice of professional psychology. Further information about requirements for the doctoral program is available from the graduate adviser and the heads of the areas of specialization.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Psychology: PSY

#### **PSY 380C. Human Neuropsychology.**

Basic issues in normal and abnormal human brain function reviewed with emphasis on disorders of higher cerebral functioning. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Psychology 383C or consent of instructor.

#### **PSY 380E. Vision Systems.**

Introduction to the anatomy, physiology, and psychophysics of human vision from an information-processing and computational perspective. Three lecture hours a week for one semester. Neuroscience 380E and Psychology 380E may not both be counted. Prerequisite: Graduate standing and consent of instructor.

#### **PSY 380F. Fundamentals of Evolutionary Psychology.**

Survey of important theories and research in evolutionary psychology, with emphasis on current problems. Three lecture hours a week for one semester. A core course option. Prerequisite: Graduate standing and consent of instructor.

#### **PSY 381C. Methods of fMRI: From Design to Data Analysis.**

Methods behind all common fMRI data preprocessing steps and data analysis models, including how to properly implement and evaluate their performance. Three lecture hours a week for one semester. Psychology 381C and Statistics and Scientific Computation 385 (Topic: Methods for fMRI) may not both be counted. Prerequisite: Graduate standing.

#### **PSY 381D. Advanced Topics in Neuroimaging.**

Addresses the latest developments in the design, analysis, and interpretation of neuroimaging data. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

#### **PSY 381E. Introduction to Psychophysiology.**

An overview of the principles, theory, and applications of using physiological measures to study mental processes. Covers the philosophical and theoretical foundations of brain/behavior relations and introduces basic electrical principles and human neurophysiology. A core course option. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### **PSY 382E. Area Seminar in Cognitive Science.**

Current issues in cognitive science. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### **PSY 182K, 282K, 382K. Internship in Clinical Psychology.**

Supervised practical experience in clinical assessment and treatment. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester, with practicum hours to be arranged. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree in clinical psychology.

#### **PSY 383C. Functional Neuroanatomy.**

An examination of the anatomy of the brain and spinal cord, emphasizing connections and functions of neural systems. Three lecture hours a week for one semester. Neuroscience 383C and Psychology 383C may not both be counted. Prerequisite: Graduate standing and consent of instructor.

#### **PSY 383E. Area Seminar in Cognitive Neuroscience.**

Current issues in cognitive neuroscience. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### **PSY 383M. Fundamentals of Physiological Psychology.**

Survey of important theories and research in physiological psychology, with emphasis on current problems. Three lecture hours a week for one semester. A core course option. Prerequisite: Graduate standing and consent of instructor.

#### **PSY 383T. Principles of Sensory and Behavioral Neuroscience.**

A proseminar covering the core material on essential topics in sensory and behavioral neuroscience. Three lecture hours a week for one semester. Neuroscience 383T and Psychology 383T may not both be counted. Prerequisite: Graduate standing and consent of instructor.

#### **PSY 384C. Bootstrap Statistics.**

Same as Neuroscience 384C. An introduction to modern methods of statistical analysis based on numerical computer simulation. Covers a range of common data analysis situations drawn mainly from the fields of neuroscience and experimental psychology. Techniques include point estimation, two-group and multiple group experiments, regression and curve fitting, and Bayesian analysis. Three lecture hours a week for one semester. Only one of the following may be counted: Neuroscience 384C, 385L (Topic: Bootstrap Statistics), Psychology 384C, 394U (Topic: Bootstrap Statistics). Prerequisite: Graduate standing, an undergraduate statistics course, and consent of instructor.

#### **PSY 184E. Current Subjects in Clinical Psychology.**

One lecture hour a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### **PSY 384K. Advanced Statistics: Experimental Design.**

Consideration of problems of analysis and design commonly encountered in psychological research. Three lecture hours a week for one semester.

Prerequisite: Graduate standing, an undergraduate statistics course, and consent of instructor.

### **PSY 384M. Advanced Statistics: Inferential.**

Same as Neuroscience 384M. Covers t-test, chi-square, analysis of variance, and nonparametric tests. Three lecture hours a week for one semester. Prerequisite: Graduate standing, an undergraduate statistics course, and consent of instructor.

### **PSY 184R. Data analysis with R.**

Using R for a variety of data analyses following the topics covered in Psychology 384M including: reading data into R, generating graphs, ANOVA, ANCOVA, and regression. One lecture hour a week for one semester. Offered on the letter-grade basis only. Prerequisite: Consent of instructor, and registration or credit for Psychology 384M.

### **PSY 385E. Area Seminar in Developmental Psychology.**

Current issues in developmental psychology. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **PSY 385N. Fundamentals of Personality Psychology.**

Survey of important theories and research in personality psychology, with emphasis on current problems. Three lecture hours a week for one semester. A core course option. Prerequisite: Graduate standing and consent of instructor.

### **PSY 385P. Fundamentals of Social Psychology.**

Survey of important theories and research in social psychology, with emphasis on current problems. Three lecture hours a week for one semester. A core course option. Prerequisite: Graduate standing and consent of instructor.

### **PSY 386E. Area Seminar in Individual Differences and Evolutionary Psychology.**

Current issues in individual differences and evolutionary psychology. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **PSY 386N. Fundamentals of Psycholinguistics.**

Survey of important theories and research in psycholinguistics, with emphasis on current problems. Three lecture hours a week for one semester. A core course option. Prerequisite: Graduate standing and consent of instructor.

### **PSY 387C. Human Language Processing.**

An overview of current psycholinguistic research, primarily in the production and comprehension of spoken language by adults. A core course option. Three lecture hours a week for one semester. Psychology 387C and 394U (Topic: Human Language Process) may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **PSY 387D. fMRI Brain Decoding.**

Explores cutting-edge techniques for finding meaningful patterns in large, noisy brain data sets, and how to use these techniques to address a variety of questions in cognitive neuroscience. Three lecture hours a week for one semester. Psychology 387D and 394U (Topic: fMRI Brain Decoding) may not both be counted. A core course option. Prerequisite: Graduate standing and consent of instructor.

### **PSY 387E. Area Seminar in Perception, Brain, and Behavior Psychology.**

Current issues in perception, brain, and behavior psychology. Three lecture hours a week for one week. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **PSY 387N. Perceptual Systems.**

Overview of theory and research in visual perception and perceptual information processing. Three lecture hours a week for one semester. A core course option. Prerequisite: Graduate standing and consent of instructor.

### **PSY 387S. Principles of Cognitive Neuroscience.**

Introduction of graduate students to the methods, theories, and research of cognitive neuroscience across a broad range of mental domains such as attention, memory, language, and decision making. A core course option. Three lecture hours a week for one semester. Psychology 387R and 387S may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **PSY 388D. Individual Differences Psychology.**

Person-to-person differences in cognitive abilities and personality, with emphases on genetic and environmental influences, developmental processes, and relations to real world outcomes. A core course option. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **PSY 388E. Area Seminar in Social and Personality Psychology.**

Current issues in social and personality psychology. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **PSY 388K. Conference on Special Topics.**

Readings, conferences, and other work on individually selected topics. Conference course. May be repeated for credit. Prerequisite: Graduate standing and twelve semester hours of upper-division coursework in psychology. Students must sign up in the Department of Psychology Graduate Office before enrolling in some sections; these are identified in the Course Schedule.

### **PSY 389K. Theory and Techniques of Assessment I.**

Introduction to intelligence and personality testing procedures, test interpretation, and ethical issues pertaining to clinical interviewing and testing. Includes instruction and feedback on clinical report writing. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor received prior to registering.

### **PSY 389L. Theory and Techniques of Assessment II.**

Clinical interviewing with adults and children. Observation and feedback for test administration and clinical skills. Three lecture hours and three hours of observation a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, Psychology 389K, and consent of instructor received prior to registering.

### **PSY 190, 290, 390. Research.**

Individual research. May be repeated for credit. Prerequisite: Graduate standing and twelve semester hours of upper-division coursework in psychology. Students must sign up in the Department of Psychology Graduate Office prior to registering.

### **PSY 391N. Learning and Memory.**

Same as Neuroscience 391N. Presentation of contemporary approaches to the study of conditioning and learning at the behavioral level. Focuses on empirical data and theoretical analysis of acquisition and performance



in Pavlovian and instrumental conditioning. Includes discussion of habituation, sensitization, stimulus control, and other paradigms for studying cognitive processes in nonverbal organisms. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **PSY 391P. Issues and Controversies in Statistical and Scientific Inquiry.**

Selected topics on the design and analysis of psychological research. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **PSY 392N. Fundamentals of Comparative Psychology.**

History and current status of comparative psychology, emphasizing several biological disciplines, including behavior genetics, ethology, evolutionary biology, and sociobiology. Three lecture hours a week for one semester. A core course option. Prerequisite: Graduate standing and consent of instructor.

### **PSY 393. Clinical Practicum I.**

Supervised practical experience in the use of clinical techniques. Three lecture hours a week for one semester, with ten to twelve hours of practicum experience to be arranged. Prerequisite: Graduate standing, Psychology 389K, and consent of instructor.

### **PSY 393K. Clinical Practicum II.**

Continuation of supervised practical experience in the use of clinical techniques. Three lecture hours a week for one semester, with ten to twelve hours of practicum experience to be arranged. Prerequisite: Graduate standing, Psychology 393, and consent of instructor.

### **PSY 394K. Fundamentals of Social and Personality Development.**

Survey of important theories, issues, and research in social and personality development. Three lecture hours a week for one semester. A core course option. Prerequisite: Graduate standing and consent of instructor.

### **PSY 394N. Fundamentals of Cognitive Development.**

Survey of important theories, issues, and research in the development of perception, language, and cognition. Three lecture hours a week for one semester. A core course option. Prerequisite: Graduate standing and consent of instructor.

### **PSY 394P. Seminars in Behavioral Neuroscience and Biopsychology.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Current Topics in Behavioral Neuroscience.** Brain-behavior relationships, particularly recent research in behavioral neuroscience, including the anatomical and neurochemical mechanisms of behavioral events, and behavioral influences on the brain. Neuroscience 394P (Topic 1: Current Topics in Behavioral Neuroscience) and Psychology 394P (Topic 1) may not both be counted. Offered on the credit/no credit basis only.

**Topic 2: Clinical Psychopharmacology.** Recent findings concerning the mechanisms of action and the behavioral effects of psychoactive drugs, particularly those used in psychiatry. Various drug types (such as sedative-hypnotics, hallucinogens, and drugs used to treat depression, schizophrenia, Parkinson's disease, and anxiety) and pathways in the brain are discussed to examine the neurochemical basis of psychiatric disorders and substance abuse.

**Topic 3: Neurobiology of Learning and Memory.** Neuroanatomical systems that are functionally related to basic forms of learning and

memory in mammals. Neuroscience 394P (Topic 3: Neurobiology of Learning and Memory) and Psychology 394P (Topic 3) may not both be counted.

### **Topic 4: Animal Communication.**

**Topic 7: Advanced Topics in Neuroanatomy.** Neuroanatomical systems and functions across species; advanced forms of neuroanatomy in mammals. Neuroscience 394P (Topic 4: Advanced Topics in Neuroanatomy) and Psychology 394P (Topic 7) may not both be counted.

**Topic 13: Foundations of Human Neuroimaging.** A survey of the foundations for neuroimaging research with a focus on cognitive neuroscience. Describes the physical methods of image acquisition and physiological mechanisms used for functional imaging. Emphasis on magnetic resonance methods for structural and functional imaging. Surveys other imaging modalities, including positron emission tomography (PET), optical, and EEG/MEG electrical source localization. Only one of the following may be counted: Biology 381K (Topic: Foundations of Neuroimaging), Neuroscience 385L (Topic 6), 394P (Topic: Foundations of Magnetic Resonance Imaging Research), Psychology 394P (Topic: Foundations of Magnetic Resonance Imaging Research), 394P (Topic 13).

**Topic 16: Quantifying Brain Structure.** Concepts and hands-on applications for quantifying aspects of brain and cellular structure, with a focus on stereological approaches. Only one of the following may be counted: Neuroscience 385L (Topic 12: Quantifying Brain Structure), 394P (Topic: Quantitative Methods for Brain Structure), Psychology 394P (Topic 16), 394P (Topic: Quantitative Methods for Brain Structure).

**Topic 17: Behavioral Neuroendocrinology.** Current research in neuroendocrinology, including action of neuroendocrine systems on behavior, assays of substances in the blood to identify gene products, and examination of stress from neuroendocrine, behavioral, health, and immunity perspectives. Only one of the following may be counted: Neuroscience 385L (Topic 5: Behavioral Neuroendocrinology), 394P (Topic: Behavioral Neuroendocrinology), Psychology 394P (Topic 17), 394P (Topic: Behavioral Neuroendocrinology).

### **PSY 194Q, 394Q. Seminars in Clinical Psychology.**

One or three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Current Topics in Clinical Psychology.** Offered on the credit/no credit basis only.

**Topic 2: Empirically Supported Interventions with Adults.**

**Topic 4: Advanced Practicum in Clinical Psychology.**

**Topic 5: Advanced Practicum in Clinical Neuropsychology.**

Restricted to clinical psychology majors. Additional prerequisite: Graduate standing and consent of instructor.

**Topic 6: Empirically Supported Interventions with Children.**

**Topic 17: Seminar in Positive Psychology.** A survey of the emerging field of positive psychology and well-being. Topics include character strengths and virtues, positive emotion, personality influences, motivation and goals, the happiness set point, and the issue of whether happiness can or should be changed.

**Topic 18: Research Methods in Clinical Psychology.** Advanced training in research methodology as it pertains to the field of clinical psychology.

**Topic 19: History and Professional Issues in Clinical Psychology.**

History and development of clinical psychology as a profession. Includes clinical psychology before World War II, the recognition of stress, the rise of evidence-based practice, professional psychology, and multicultural diversity.

**Topic 20: Diversity Issues in Research and Practice.**

Methodological considerations involved in designing research projects,

and clinical assessment and treatment concerns that arise when working with diverse populations.

### **PSY 394S. Seminars in Developmental Psychology.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 2: Children's Racial/Gender Schemata.**

**Topic 3: Literacy Acquisition.**

**Topic 4: Psychological Processes in Family Violence.**

**Topic 5: Language and Conceptual Development.**

**Topic 6: Infant Perception and Cognition.**

**Topic 7: Professional Issues in Academia.**

### **PSY 394T. Seminars in Evolutionary Psychology.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **PSY 394U. Seminars in Cognitive or Perception Psychology.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 3: Introduction to Cognitive Science.** Same as Cognitive Science 380 (Topic 1: Introduction to Cognitive Science), Linguistics 392 (Topic 1: Introduction to Cognitive Science), and Philosophy 383C. Only one of the following may be counted: Cognitive Science 380 (Topic 1), Linguistics 392 (Topic 1), 393 (Topic: Introduction to Cognitive Science), 393 (Topic: Topics in Cognitive Science), Philosophy 383 (Topic: Introduction to Cognitive Science), 383C, Psychology 394U (Topic 3).

**Topic 4: Cognition.**

**Topic 6: Memory.**

**Topic 7: Speech Perception.**

**Topic 8: Topics in Vision and Hearing.** Current research in human vision and/or hearing. Neuroscience 385L (Topic 7: Topics in Vision and Hearing) or Psychology 394U (Topic 8) may not both be counted.

**Topic 9: Visual Perception.** Offered on the credit/no credit basis only.

**Topic 12: Knowledge Representation.** Psychological approaches to the ways in which information is stored and processed, focusing on how particular assumptions and mental representation make tasks either easy or difficult to perform.

**Topic 13: Reasoning and Decision Making.** High-level cognitive processes of reasoning and decision making. Explores human rationality, analogical reasoning, causal reasoning, heuristics, and decision making in naturalistic settings.

**Topic 14: Topics in Systems Neuroscience.** Focuses on one or two topics and examines them in depth through group discussions of key scientific manuscripts. Discusses both classical studies and contemporary research. Only one of the following may be counted: Neuroscience 394P (Topic 8: Topics in Systems Neuroscience), Psychology 394U (Topic 14), 394U (Topic: Advanced Topics in Systems Neuroscience).

**Topic 15: Cognitive Neuroscience.** Readings, results, and discussion regarding cutting-edge work in the field. Emphasis on how computational models can be used to bridge brain and behavior. Biology 381K (Topic: Cognitive Neuroscience) and Psychology 394U (Topic 15) may not both be counted.

**Topic 16: Perception and Action.** Current topics in visually guided behavior, including eye movements, attention, and motor control, from behavioral, computational, and neurophysiological approaches. Neuroscience 394P (Topic 9: Perception and Action) and Psychology 394U (Topic 16) may not both be counted.

**Topic 17: Models of Cognition.** Formal models of cognition and related analysis, such as model selection statistics and Bayesian hierarchical parameter fitting.

**Topic 18: Advanced Topics in Perceptual Systems.** Readings, talks, and discussions on perceptual systems.

**Topic 19: Statistical Methods in Computational Neuroscience.** Same as Neuroscience 394P (Topic 10: Statistical Methods in Computational Neuroscience). Introduction to statistical and computational methods for understanding information processing in the nervous system, with emphasis on neural coding and statistical modeling of neural responses. Prerequisite: Graduate standing and consent of instructor.

### **PSY 394V. Seminars in Social and Personality Psychology.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 6: The Self.**

**Topic 7: Social Stereotypes.**

**Topic 8: Psychosomatic Processes.** Survey of theories and findings concerning the links between psychological states and health. Includes emotion, stress, coping, psychoneuroimmunology, disclosure, and the social correlates of health and illness.

**Topic 9: Language and Personality.** An exploration into computer-based methods used to study the links between word use and basic social and personality processes.

**Topic 10: Close Relationships.** Social psychological theory and research on the topic of close relationships.

**Topic 11: Social Neuroscience.** Introduction to psychological and neural foundational concepts in social neuroscience. Surveys current work in the field to examine how it may or may not contribute to the study of social psychology.

### **PSY 395S. Fundamentals of Developmental Psychology.**

Emphasizes understanding the major theoretical approaches to the field, with an introduction to empirical work inspired by these theoretical perspectives. Three lecture hours a week for one semester. Psychology 394S (Topic: Fundamentals of Developmental Psychology) and 395S may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **PSY 396. Advanced Behavior Pathology.**

Evaluation of the experimental and theoretical literature concerning major behavioral disorders. Three lecture hours a week for one semester. A core course option. Prerequisite: Graduate standing and consent of instructor.

### **PSY 396C. Child and Adolescent Psychopathology.**

The epidemiology, etiology, associated features, developmental course, and prognosis of childhood and adolescent behavior disorders. Three lecture hours a week for one semester. A core course option. Prerequisite: Graduate standing and consent of instructor.

### **PSY 396D. Clinical Psychopharmacology.**

Same as Neuroscience 396D. Recent findings concerning the mechanisms of action and the behavioral effects of psychoactive drugs, particularly those used in psychiatry. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **PSY 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in psychology, twelve semester hours of upper-division or

graduate coursework in psychology, and consent of the graduate adviser; for 698B, Psychology 698A.

### **PSY 398T. Supervised Teaching in Psychology.**

Teaching under close supervision of course instructor for two semesters; weekly meetings of two to four hours during the semester; individual consultation and reports throughout the teaching period. Three lecture hours a week for one semester. Prerequisite: Graduate standing and appointment as a teaching assistant.

### **PSY 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **PSY 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Psychology 399R, 699R, or 999R.

## **Religious Studies**

*Master of Arts  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Burdine Hall (BUR) 406, phone (512) 232-7737; campus mail code: A3700

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Religious Studies, 2505 University Avenue Stop A3700, Austin TX 78712

**URL:** <http://www.utexas.edu/cola/depts/rs/graduate/>

### **Facilities for Graduate Work**

Graduate students in religious studies have access to significant collections of research materials in a number of fields. The Perry-Castañeda Library houses nearly two hundred thousand volumes cataloged under categories pertaining to religious studies. The University Libraries also have extensive microfilm and microfiche holdings of document collections and provide access to important online collections of source materials. University Libraries' substantial holdings in history, classics, sociology, anthropology, Asian studies, and Middle Eastern studies are invaluable to students studying religion. Special collections in the Harry Ransom Center, the Benson Latin American Collection, and the Dolph Briscoe Center for American History also offer opportunities for research.

### **Areas of Study**

All candidates for graduate degrees are expected to develop a broad competence in the discipline as a whole as well as expertise in their area of concentration. The program offers five concentrations, each with its own specific objectives: religion in Asia; religion in the ancient Mediterranean; religion in Europe and the Middle East; religion in the Americas; and transregional and comparative studies in religion.

### **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Robert H Abzug  
Marion Enid Bodian  
Joel P Brereton  
Virginia Garrard Burnett  
Matthew J Butler  
Alison K Frazier  
Oliver Freiberger  
Steven J Friesen  
Karl Galinsky

Jennifer Graber  
Jo Ann Hackett  
Jonathan Kaplan  
A Azfar Moin  
Martha G Newman  
Glenn A Peers  
Chad Eugene Seales  
John W Traphagan  
L M White

## **Degree Requirements**

### **Master of Arts**

To obtain the master's degree in religious studies, students must complete a total of thirty semester hours: either twenty-seven hours of coursework and a three-hour report; twenty-four hours of coursework and a six-hour thesis; or thirty hours of coursework with no thesis or report. Students who wish to pursue the no-thesis, no-report degree option must obtain approval in advance from the Department of Religious Studies. Prior graduate coursework will be taken into consideration. All students must complete at least eighteen semester hours of graduate coursework in religious studies. No more than six hours of upper-division undergraduate credit may be counted toward the degree. All students must complete a theory and methods course (Religious Studies 383M) and must participate in a departmental colloquium that meets twice a month.

Students also complete the core courses required for their area of specialization. Specific course numbers are available from the office of the graduate coordinator.

In addition, in consultation with his or her adviser, each student identifies a related field outside the major field in which to complete six hours of graduate coursework. This coursework may be either from outside the department or in another area of religious studies. The related field must be approved by representatives of the Graduate Studies Committee.

Each student's progress is reviewed during his or her fourth semester of study by the Graduate Studies Committee. This committee makes one of three recommendations: that the student (1) proceed to the doctoral degree requirements upon satisfactory completion of the master's degree requirements; (2) be reviewed again before proceeding to the doctoral degree requirements; or (3) leave the program after receiving the Master of Arts degree.

### **Doctor of Philosophy**

A doctoral student in religious studies must complete sixty semester hours of coursework, including the doctoral seminar in religious studies (Religious Studies 384D), dissertation research and writing courses, and additional courses related to the student's concentration. Courses taken to complete the master's degree requirements (except for the master's report or thesis) also count toward the total number of hours. Students who enter with a master's degree from another institution may petition to have up to six hours of coursework (not including the thesis hours) transferred toward the doctoral requirements. While in residence, doctoral students must participate in the departmental colloquium that meets twice a month.

Students enter the program having chosen one of the five areas of concentration. They must fulfill the foreign language requirement for the concentration. In addition, each student identifies a thematic topic that crosses geographical and temporal boundaries and completes other courses necessary for exam preparation. Each student's progress is reviewed at the end of the eighth semester of study, at which time

it is normally expected that he or she has been admitted to doctoral candidacy.

To qualify for admission to candidacy for the doctoral degree, students must complete the prescribed course of study in the concentration area and pass qualifying exams in four fields: (1) the major field; (2) the supporting field(s); (3) the thematic field; and (4) the special topic or dissertation field. The exams consist of written essays for each field and an oral defense of the essays. Candidacy is also contingent upon regular participation in the departmental colloquium, as certified by the graduate adviser. To file for doctoral candidacy, the student must establish a dissertation committee and have a dissertation proposal accepted by the committee. Students then write the dissertation and defend it in a final oral examination before the dissertation committee. Students are expected to write the dissertation, have it approved, and pass the final oral examination within two years of admission to candidacy.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Religious Studies: R S

#### R S 180. Proseminar.

An introduction to the research methodology and ancillary disciplines used in current religious studies. One lecture hour a week for one semester. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### R S 380R. Topical Readings in Religious Studies.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

#### R S 381. Conference Course in Religious Studies.

Conference course. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

#### R S 383. Topical Seminars.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic and are given in the Course Schedule.

#### R S 383C. Topics in Comparative Religion.

Advanced treatment of selected problems, topics, or themes concerning comparative approaches to the study of religion. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

#### R S 383M. Theory and Method in the Study of Religion.

Introduction to the history of the discipline, discussion of classical interpretative works, and examination of current theoretical and methodological developments in the field. Three lecture hours a week for one semester. Religious Studies 383 (Topic: Theory and Method in the Study of Religion) and 383M may not both be counted. Prerequisite: Graduate standing and consent of the graduate adviser.

#### R S 383T. Topics in Theoretical Approaches to the Study of Religion.

Advanced treatment of selected problems, topics, or themes concerning theoretical approaches to the study of religion. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

#### R S 384D. Doctoral Seminar in Religious Studies.

Advanced seminar designed to introduce students to the profession of religious studies. Includes development and preparation of a dissertation proposal, placing scholarship within a broader theoretical context, and pedagogical issues in teaching religious studies at the undergraduate college level. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

#### R S 385H. Proseminars in Ancient Near Eastern Studies.

A survey of methods and approaches in the study of the ancient Near Eastern and early Hebrew environments. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

#### R S 385K. Early Jewish and Christian Literature I.

A survey of major categories of early Jewish and Christian literature by genre in light of comparative historical research. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

#### R S 385L. Early Jewish and Christian Literature II.

A survey of major categories of early Jewish and Christian literature by genre in light of comparative historical research. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

#### R S 386C. Critical Issues in Christian Origins.

Studies of key scholarly works in and critical approaches to the study of Christian origins in their historical, social, and cultural contexts. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

#### R S 386H. Critical Issues in the Hebrew Bible.

Advanced studies of critical issues in research on key areas of study in the Hebrew Bible and its environment. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

#### R S 386M. Critical Issues in Ancient Mediterranean Religions.

Studies of key scholarly works in and critical approaches to the study of ancient Mediterranean religions in their historical, cultural, and archaeological contexts. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

#### R S 387M. Seminars in Ancient Mediterranean Religions.

Advanced treatment of selected problems, topics, or themes in the study of the religions of the ancient Mediterranean world. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

#### R S 388E. Core Readings in Religion in Europe.

Discussion of key scholarly works in and major approaches to the study of religion in Europe. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### **R S 388J. Core Readings in Jewish Studies.**

Discussion of key scholarly works in and major approaches to Jewish studies. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### **R S 388M. Core Readings in Islamic Studies.**

Discussion of key scholarly works in and major approaches to the study of Islam and Muslim societies. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### **R S 389R. Research Seminars on Religion in Europe and the Middle East.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **R S 390T. Topics in European and Middle Eastern Religion.**

Advanced treatment of selected problems, topics, or themes concerning religion in Europe and the Middle East. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **R S 391L. Approaches to the Study of Religion in Latin America.**

An introduction to the history of scholarship about religion in Latin America and the Caribbean. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### **R S 391N. Approaches to the Study of Religion in the United States.**

An introduction to the history of scholarship about religion in the United States, including recent research on the Atlantic world, the Pacific world, and the Western Hemisphere. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### **R S 392T. Topics in Religion in the Americas.**

Advanced treatment of selected problems, topics, or themes concerning religion in the Americas. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **R S 393C. Core Readings in Religion in Asia.**

Discussion of key scholarly works in and major approaches to the study of religion in Asia. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

### **R S 393F. Topics in the Foundations of Asian Religions.**

Introduction to and analysis of primary sources for the study of religion in Asia. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **R S 394T. Topics in Religion in Asia.**

Advanced treatment of selected problems, topics, or themes concerning religion in Asia. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser.

### **R S 397Q. Preparation for Qualifying Exams.**

Designed for religious studies doctoral students preparing for qualifying examinations. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### **R S 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in religious studies and consent of the graduate adviser; for 698B, Religious Studies 698A.

### **R S 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in religious studies and consent of the graduate adviser.

### **R S 398T. Supervised Teaching in Religious Studies.**

Weekly group meetings with the supervising instructor, individual consultations, and reports. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

### **R S 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **R S 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Religious Studies 399R, 699R, or 999R.

## **Russian, East European, and Eurasian Studies**

*Master of Arts*

### **For More Information**

**Campus address:** Burdine Hall (BUR) 452, phone (512) 471-3607, fax (512) 471-6710; campus mail code: F3600

**Mailing address:** The University of Texas at Austin, Graduate Program, Center for Russian, East European, and Eurasian Studies, 2505 University Avenue Stop F3600, Austin TX 78712

**URL:** <http://www.utexas.edu/cola/centers/creees/>

### **Facilities for Graduate Work**

The University Libraries contain about eighty thousand volumes and excellent supporting material on Russia and Eastern Europe. The Harry Ransom Center holds important original documents, including the Alexander Kerensky papers and collections on Soviet history and literature. The Population Research Center houses extensive census data for Eastern Europe and the former Soviet Union, dating back to the Russian census of 1897. The Audio Visual Library in the Fine Arts Library has several hundred films and video recordings from Russia, Eastern Europe, and Eurasia. The Lyndon B. Johnson Presidential Library and Archive holds millions pages of state documents, many of which relate to Cold War diplomacy, arms control, East-West trade, and events like the 1968 Prague Spring.

The Center for Russian, East European, and Eurasian Studies Resource Center houses about five hundred books and journals on the region, as well as audio and video recordings. More than sixty faculty members regularly teach courses dealing with Russia, Eastern Europe, and Eurasia.

## Areas of Study

The Master of Arts in Russian, East European, and Eurasian studies is a two-year, multidisciplinary program that offers advanced scholarly training for students who seek integrated knowledge of the language, history, society, and culture of the former Soviet Union and Eastern/Central/Southeast Europe, or one or more of their subareas. The program is designed for students preparing for careers in the professions, and for those seeking an intermediate, interdisciplinary master's degree before pursuing a doctorate in a particular discipline. Within the requirements of the program, the student may choose an individual course of study to meet his or her needs and may have a broader choice of courses than is possible in a disciplinary master's degree program.

The program may involve work in any of the following academic disciplines: anthropology, architecture, art history, business, comparative literature, economics, geography, government, history, law, linguistics, music, philosophy, public affairs, radio-television-film, sociology, Slavic languages and literatures, and Turkic languages.

Students who complete this degree are expected to have an extensive understanding of the country or countries of their specialization, including a working knowledge of one of the region's languages.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Zoltan D Barany	Keith A Livers
Craig A Campbell	Inga Markovits
David J Eaton	Robert G Moser
James K Galbraith	Joan H Neuberger
Thomas J Garza	Mary C Neuburger
Sabine Hake	Michael A Pesenson
Ian F Hancock	Gilbert C Rappaport
Tatiana Kuzmic	Danilo F Udovicki
Tatjana Lichtenstein	Charters S Wynn
Amy H Liu	

## Admission Requirements

Applicants must have a bachelor's degree in any field from an accredited college or university. Preferred qualifications include significant course work on and/or professional experience in the former Soviet Union or East/Central/Southeast Europe, as well as intermediate proficiency in at least one of the languages spoken in the region.

## Degree Requirements

The requirements of the program are designed to give students a broad background in the Russian, East European, and Eurasian area. Students may choose the thesis option, consisting of at least thirty semester hours of coursework (including the thesis); or the report option, consisting of at least thirty-three semester hours (including the report).

Under either option, at least eighteen hours must be in non-language graduate coursework that deals primarily with the Russian, East European, and Eurasian area. In addition to the interdisciplinary core course, Russian, East European, and Eurasian Studies 381, each student must take at least one course from each of the following groups:

- Topics in Literature and Culture (Russian, East European, and Eurasian Studies 386);
- Topics in History, Economics, and Government (Russian, East European, and Eurasian Studies 387);

- Topics in Sociology, Geography, and Anthropology (Russian, East European, and Eurasian Studies 388); and
- a methodology or theory course from a list of approved courses.

All courses counted toward the degree must have content relevant to the former Soviet Union or East/Central/Southeast Europe. The student must pass an oral proficiency test in the selected language at the Interagency Language Roundtable (ILR) level 2 or the American Council of Teachers of Russian advanced level. Credit earned in fulfilling the language requirement may not be counted toward the degree, since language competence is a necessary tool for graduate study in Russian, East European, and Eurasian studies; however, content courses taught in a foreign language at the advanced (fourth year) level may be counted as electives courses towards the MA degree.

## Dual Degree Programs

The Center for Russian, East European, and Eurasian Studies offers the following dual degree programs in cooperation with other divisions of the University. More information is available from the graduate adviser in each program.

Field(s) of Study	Degree(s)
Business administration	Master of Business Administration
Global policy studies	Master of Global Policy Studies
Law	Doctor of Jurisprudence
Public affairs	Master of Public Affairs
Radio-television-film	Master of Arts

## Graduate Courses

The following courses are offered by the Center for Russian, East European, and Eurasian Studies. Courses in some languages of the area are offered by the Department of Slavic and Eurasian Studies (<https://www.utexas.edu/cola/depts/slavic>).

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Czech: CZ

#### CZ 395. Conference Course.

Survey of Czech literature, language, culture, linguistics, history, and politics. Individual instruction. May be repeated for credit. Prerequisite: Graduate standing.

### Polish: POL

#### POL 395. Conference Course.

Study of individual problems in Polish language, literature, and culture. Conference course. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

## Russian, East European, and Eurasian Studies: REE

#### REE 380. International Business Fellows Seminar.

Same as Asian Studies 391 (Topic 6: International Business Fellows Seminar), Latin American Studies 381 (Topic 8: International Business Fellows Seminar), and Middle Eastern Studies 380. Multidisciplinary seminar for students in area studies, business administration, law, and

public policy. The faculty includes both academics and business leaders. Three lecture hours a week for one semester. Only one of the following may be counted: Asian Studies 391 (Topic 6), International Business 395 (Topic: International Business Fellows Seminar), Latin American Studies 381 (Topic 8), Middle Eastern Studies 380, Public Affairs 388K (Topic: International Business Fellows Seminar), Russian, East European, and Eurasian Studies 380. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **REE 381. Seminar in Russian, East European, and Eurasian Civilizations and Cultures.**

Core course. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **REE 382. Conference Course in Russian, East European, and Eurasian Studies.**

Individual instruction on some aspect of the former Soviet Union or Eastern Europe. Conference course. May be repeated for credit. Prerequisite: Graduate standing.

### **REE 385. Topics in Russian, East European, and Eurasian Studies.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic and are given in the Course Schedule.

### **REE 386. Topics in Literature and Culture.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Chechnya: Politics, Power, and People.** The history, culture, religions, and recent upheaval of Chechnya. Russian, East European, and Eurasian Studies 385 (Topic: Chechnya: Politics, Power, and People) and 386 (Topic 1) may not both be counted.

**Topic 2: Bulgakov's Master and Margarita.** Only one of the following may be counted: Russian, East European, and Eurasian Studies 385 (Topic: Bulgakov's Master and Margarita), 385 (Topic 2), 386 (Topic 2).

**Topic 3: Russian Literature and the Devil.** Examines Russian literature's extensive reflection on the nature and place of evil in human existence. Only one of the following may be counted: Russian, East European, and Eurasian Studies 385 (Topic: Russian Literature and the Devil), 385 (Topic 3), 386 (Topic 3).

**Topic 4: Madness and Madmen in Russian Literature.** Russian, East European, and Eurasian Studies 385 (Topic: Madness and Madmen in Russian Literature) and 386 (Topic 4) may not both be counted.

### **REE 387. Topics in Economics, History, and Government.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **REE 388. Topics in Anthropology, Sociology, and Geography.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **REE 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in Russian, East European, and Eurasian studies; for 698B, Russian, East European, and Eurasian Studies 698A.

### **REE 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for

one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in Russian, East European, and Eurasian studies.

## **Russian: RUS**

### **RUS 380E. Topics in Advanced Russian.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Cultural Geography of Russia.** Culture, history, and traditions of diverse people and ethnic groups of Russia from a geographical perspective. Only one of the following may be counted: Russian 380E (Topic 1), Russian, East European, and Eurasian Studies 385 (Topic: Cultural Geography of Russia), 385 (Topic 7).

### **RUS 385. Topics in Russian Linguistics.**

Sample topics include Old Russian and the history of the Russian literary language, as well as more specialized topics in synchronic, historical, or applied perspective. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **RUS 395. Conference Course.**

Study of individual problems in Slavic languages. Conference course. May be repeated for credit. Prerequisite: Graduate standing.

### **RUS 397P. Topics in Applied Linguistics and Pedagogy.**

Study of topics in applied linguistics related to the teaching of Russian and other Slavic languages. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **RUS 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in the Department of Slavic and Eurasian Studies and consent of the graduate adviser; for 698B, Russian 698A.

### **RUS 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in the Department of Slavic and Eurasian Studies and consent of the graduate adviser.

### **RUS 398T. Supervised Teaching in Russian.**

Principles and methods of teaching Russian. Analysis of relevant foreign language teaching theories and methodologies, curriculum and curricular materials development for university and secondary school teachers of Russian. Three lecture hours a week for one semester. Prerequisite: Graduate standing and appointment as a teaching assistant.

### **RUS 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **RUS 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Russian 399R, 699R, or 999R.

## **Serbian/Croatian: S C**

### **S C 395. Conference Course.**

Study of individual problems in Serbian and Croatian languages, literature, and culture. Conference course. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in the Department

of Slavic and Eurasian Studies, or graduate standing and consent of instructor.

## Slavic: SLA

# Science, Technology, and Society

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## Science, Technology, and Society: STS

### STS 380. Proseminar: Current Issues in the Societal Impact of Science and Technology.

Overview of the fundamentals of the practice of science, and of science as a human enterprise that interacts with and transforms cultural views, ideas, and habits. Includes lectures by natural scientists, engineers, and social scientists on the societal impact of rapid scientific technological developments from the perspectives of their individual disciplines.

Students complete a comprehensive research project on a topic related to the course. Three lecture hours a week for one semester. May not be repeated for credit. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

# Sociology

*Master of Arts  
Doctor of Philosophy*

## For More Information

**Campus address:** College of Liberal Arts Building (CLA) 3.306, phone (512) 232-6300, fax (512) 471-1748; campus mail code: A1700

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Sociology, 305 East 23rd Street Stop A1700, Austin TX 78712

**E-mail:** evelyn.porter@austin.utexas.edu

**URL:** <http://www.utexas.edu/cola/depts/sociology/>

## Facilities for Graduate Work

The Department of Sociology at the University of Texas at Austin is one of the top graduate programs in the country. Its forty-five faculty members are involved in research and publication on a broad range of topics. Among the department's specialties are gender; race/ethnicity; demography; family; health; poverty and inequality; political sociology/development and globalization; and work, occupations, and organizations. Graduate students receive instruction in the full range of sociological methodologies, including comparative/historical methods, ethnographic fieldwork, and quantitative data analysis. Professionalization courses include formal instruction on publishing, presenting papers at professional conferences, and teaching. The department has housed a number of prominent journals, including *Gender & Society*, *The Journal of Health and Social Behavior*, and the *Latin American Research Review*. Faculty members serve key roles in a number of national and international professional societies, including the American Sociological Association and the Population Association of America.

The Department of Sociology is located in the College of Liberal Arts Building (CLA), which also houses the innovative Urban Ethnography Lab and the Population Research Center (PRC), one of the preeminent demographic research and training centers in the United States. Research grant and fellowship opportunities are available through the PRC. The research foci of the PRC include children, youth, and families; population health; religion and demographic processes; and Latin American and border demography. Both the Department of Sociology and the PRC have computer laboratories, data archives, and a weekly lecture series. There are also opportunities for students to receive travel and fellowship funds to support their work.

Faculty and students are also affiliated with the Center for Women's and Gender Studies (CWGS), which provides graduate students with the opportunity to receive a certification in women's studies. Many sociology students present their original research at the annual CWGS graduate student conference. Other centers on campus provide research and teaching opportunities for sociology graduate students, including the Warfield Center for African and African American Studies, the Department of Mexican American and Latino/a Studies, the Center for Asian American Studies, the Center for Middle Eastern Studies, the Schusterman Center for Jewish Studies, and the Teresa Lozano Long Institute of Latin American Studies.

## Areas of Study

Graduate study is offered in theory; education; health; family; race and ethnicity; gender; gender and sexuality; political sociology/development and globalization; crime, law, and deviance; demography; and work, occupations, and organizations.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Ari Adut	Marc A Musick
Jacqueline L Angel	Pamela Marie Paxton
Ronald J Angel	David S Pedulla
Javier Auyero	Elizabeth M Pettit
Simone A Browne	Joseph E Potter
Johnny S Butler	Daniel A Powers
Ben Carrington	Tetyana Pudrovskaya
Shannon E Cavanagh	Kelly Raley
Mounira M Charrad	Mark Regnerus
Robert Crosnoe	Catherine Riegle-Crumb
Sheldon Ekland-Olson	Bryan R Roberts
Toni L Falbo	Keith Robinson
Daniel G Fridman	Nestor P Rodriguez
Jennifer Glass	Mary Rose
Gloria Gonzalez-Lopez	Catherine E Ross
Mark D Hayward	Sharmila Rudrappa
Robert A Hummer	Harel Shapira
Yasmiyn Irizarry Murphy	Debra J Umberson
William R Kelly	Peter Ward
David S Kirk	Eric M Warr
Ken-Hou Lin	Samuel C Watkins
Leticia J Marteleto	Alexander A Weinreb
John Mirowsky	Christine L Williams
Chandra L Muller	Michael P Young



# Degree Requirements

## Master of Arts

Students typically earn the Master of Arts in the course of work leading to a doctoral degree, rather than as an end in itself. The master's degree requires thirty semester hours of graduate work, including six hours in the thesis course. The coursework must include: two courses in social statistics, one in research methods, two in theory and three sociology elective courses. The degree program usually takes two years. Students often enter the graduate program with a master's degree from another institution. Such students must take the required courses at the University or transfer credit for them as described in Degree Requirements (p. 20).

## Doctor of Philosophy

The doctoral program requires at least forty two-semester hours of graduate coursework, including two dissertation courses. The coursework requirements include the twenty-four semester hours of work required for the master's degree and a variety of methodological and substantive courses in sociology. Specific course requirements may vary depending on the demography or the non-demography program of work. Additional information is available from the department.

To be admitted to candidacy for the doctoral degree, the student must have completed all master's degree requirements and the doctoral course requirements, must pass a comprehensive examination in an area of specialization, and must defend a dissertation proposal. The degree is awarded after completion and defense of the dissertation. Most students need three or four years beyond the master's degree to complete the doctorate.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## Sociology: SOC

### SOC 180, 280, 380. Conference Course.

Sociological topics not otherwise offered at the graduate level. The equivalent of one, two, or three lecture hours a week for one semester. May be repeated for credit, but no more than six semester hours may be counted toward the Master of Arts and no more than twelve semester hours may be counted toward the doctoral degree. May not be substituted for required courses in statistics, methods, or theory, nor may more than one of the three other area requirements be fulfilled by Sociology 380. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### SOC 383K. Seminars in Social Psychology.

Substantive issues and current topics in social psychology. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: History and Theories of Social Psychology.** May be counted toward elective requirements.

### SOC 384J. Special Topics in Social Statistics.

Three lecture hours a week for one semester; additional laboratory hours may be required for some topics. Not all topics are offered every year.

May be counted toward the statistics and methods requirement. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and Sociology 384L and 385L with a grade of at least B- in each.

### SOC 384L. Social Statistics: Basic Concepts and Methods.

Review of descriptive statistics; probability concepts; statistical inference, bivariate correlation and regression, multiple regression, dummy variables, analysis of variance, analysis of covariance; applications of statistical computing packages to social science data. Three lecture hours a week for one semester, with additional laboratory hours to be arranged. May be counted toward the statistics and methods requirement. Required of all graduate students during their first semester of study. Prerequisite: Graduate standing.

### SOC 384M. Seminar in Data Analysis.

Quantitative sociological research integrating the use of statistical analysis with computer applications and survey data. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and Sociology 384L or the equivalent.

**Topic 1: Evaluation of Social Policy.** May be counted toward the statistics and methods requirement.

### SOC 385K. Social Statistics: Discrete Multivariate Models.

Assumptions, estimation, testing, and parameter interpretation for models using categorical data; applications of statistical computing packages and programs to social science data. Three lecture hours a week for one semester. May be counted toward the statistics and methods requirement. Prerequisite: Graduate standing, and Sociology 384L or the equivalent.

### SOC 385L. Social Statistics: Linear Models and Structural Equation Systems.

Model specification; review of simple regression; multiple regression in matrix form; ordinary and generalized least squares; recursive and nonrecursive structural equation models; measurement error and unobserved variables. Three lecture hours a week for one semester, with additional laboratory hours to be arranged. May be counted toward the statistics and methods requirement. Prerequisite: Graduate standing, and Sociology 384L or the equivalent.

### SOC 386L. Social Statistics: Dynamic Models and Longitudinal Data Analysis.

Applications of dynamic models to data collected at successive points in time. Dynamic structural equation models; statistical time-series analysis; stochastic processes, panel, and event-history analysis. Three lecture hours a week for one semester. May be counted toward the statistics and methods requirement. Prerequisite: Graduate standing, and Sociology 384L or the equivalent.

### SOC 387C. Special Topics in Social Research Methods.

Three lecture hours a week for one semester; additional laboratory hours may be required for some topics. Not all topics are offered every year. May be counted toward the statistics and methods requirement. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and Sociology 387J.

### SOC 387J. Fundamentals of Research Methods.

Fundamental assumptions and procedures for conducting sociological research, including the logic of science, the links between theory and methods, measurement, experiments, sampling, surveys, qualitative methods, and ethics. Three lecture hours a week for one semester. May be counted toward the statistics and methods requirement. Required of all graduate students during their first semester of study. Prerequisite: Graduate standing.

### **SOC 387L. Qualitative Methods for the Social Sciences.**

Qualitative survey research methods, approaches, and designs, including participant observational techniques, semistructured interviewing, and formal questionnaire and census-type surveys. Three lecture hours a week for one semester. May be counted toward the statistics and methods requirement. Sociology 387L and 387T may not both be counted. Prerequisite: Graduate standing, and Sociology 384L or the equivalent.

### **SOC 388K. Field and Observational Methods.**

Rationale and logic for field research; participant and nonparticipant observation; informant and conversational interviewing; personal documents, records, and physical traces; life histories; sources of error and bias; personal and ethical dilemmas; modes of analysis. Three lecture hours a week for one semester. May be counted toward the statistics and methods requirement. Prerequisite: Graduate standing.

### **SOC 388L. Historical and Comparative Methods.**

Scope and methods of historical and comparative sociology; application of historical sources to answer sociological questions; logic of comparative analysis in theory construction. Three lecture hours a week for one semester. May be counted toward either the statistics and methods requirement or the political sociology specialization. Prerequisite: Graduate standing.

### **SOC 389K. Seminars in Demography.**

Substantive issues and current topics in population studies and social demography. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: General Approaches to the Study of Population.** May be counted toward the demography specialization. Required for all students specializing in demography.

**Topic 2: Human Fertility.** May be counted toward either the demography specialization or the health specialization.

**Topic 3: Human Mortality.** May be counted toward either the demography specialization or the health specialization.

**Topic 4: International Migration.** Same as Latin American Studies 381 (Topic 1: International Migration). May be counted toward either the demography specialization or the race and ethnicity specialization in the sociology degree program.

**Topic 6: Training Seminar in Demography.** May be counted toward the demography specialization. Required for all students specializing in demography. Offered on the credit/no credit basis only.

**Topic 9: Immigration Policy.** May be counted toward either the demography specialization or the race and ethnicity specialization.

**Topic 11: Family and Household Demography.** Trends in family behavior, theories about family change, and analytical techniques for studying families and households. May be counted toward either the demography specialization or the family specialization. Sociology 389K (Topic 11) and Women's and Gender Studies 393 (Topic: Family and Household Demography) may not both be counted.

**Topic 12: Demography of Health and the Life Course.** An in-depth introduction to the major conceptual frameworks and empirical research that examine distal and proximate social factors influencing adult health. Includes the assessment of key social and biological pathways linking social conditions at particular points in the life course with adult health outcomes. May be counted toward either the demography specialization or the health specialization.

**Topic 13: Event History Analysis.** Substantive issues and current topics in population studies and social demography. May be counted toward the demography specialization. Sociology 389K (Topic 13) and Statistics and Scientific Computation 385 (Topic: Event History Analysis) may not both be counted.

### **SOC 190K, 290K, 390K, 690K, 990K. Proposal Preparation.**

Preparation of proposal for the doctoral dissertation. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, completion of all coursework, and consent of instructor.

### **SOC 391L. Basic Demographic Methods and Materials.**

Population composition, change, and distribution; methods of standardizing and decomposing rates; life tables and population models; analysis of data from advanced and developing countries; applications of computer programs for demographic analysis. Three lecture hours a week for one semester. May be counted toward the statistics and methods requirement. Required of all students specializing in demography. Prerequisite: Graduate standing, and Sociology 384L or the equivalent.

### **SOC 394K. Seminars in Sociological Theory.**

Development of social thought; the emergence of systematic sociological theory; interrelations with other social sciences. Three lecture hours a week for one semester. Graduate students in sociology must take Topics 2 and 3. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 2: Contemporary Sociological Theory.** May be counted toward the theory requirement. Required of all graduate students during their second semester of study.

**Topic 3: Classical Sociological Theory.** A review of classic works in sociological theory, focusing on the work of nineteenth-century and early twentieth-century theorists. Critically examines the historical and theoretical context of sociology's founding ideas. Explores the promises and problems of the relationship between sociological theory and the modern era. May be counted toward the theory requirement. Required of all graduate students during their first semester of study.

**Topic 12: Sociology of Culture.** An overview of some of the major contemporary research in the sociology of culture. Includes discussion of meaning systems and their transformations; symbolic nature of consumption; relationship between culture and social stratification; cultural bases of power; culture industry; and sociology of the arts. May be counted toward the theory requirement.

**Topic 13: Cultural Studies.** Examines the history, debates, and key developments within the trans-disciplinary field of cultural studies. Considers the significance of the intellectual work produced in Britain from the 1940s to the present and the relationship today between the sociology of culture and cultural sociology. May be counted toward the theory requirement.

**Topic 14: Theories of Power.** Examines the social theory controversy over the definition of the terms power and domination. Considers the classical and contemporary theoretical understandings of power and domination and studies the diverse ways in which these concepts have been deployed in empirical research. May be counted toward either the theory requirement or the political sociology specialization.

### **SOC 395E. Seminars in Education.**

In-depth theoretical and policy discussions designed to give students intensive exposure to specific issues in education. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Sociology of Education.** Provides an overview of the field of sociology of education. Examines the ways in which schools reproduce, reinforce, and challenge the prevailing social, economic, and political relationships in society. Includes discussions of why people go to schools, who has access, and the effects of schools on individuals, communities, and society. May be counted toward either the education specialization or the work, occupations, and

organizations specialization. Sociology 396L (Topic 12: Sociology of Education) and 395E (Topic 1) may not both be counted.

**Topic 2: Poverty, Race, and Schools.** Focuses on children's academic outcomes within the contexts of poverty, race, and schools in K-12 education. Includes an assessment of a number of student groups in an effort to understand why some children have higher quality schooling experiences than others. Considers the roles of teachers and parents in affecting children's academic outcomes, with primary emphasis placed on their importance in elementary and middle school. May be counted toward either the education specialization or the race and ethnicity specialization. Sociology 396L (Topic: Poverty, Race, and Schools) and 395E (Topic 2) may not both be counted.

**Topic 3: High School and Transition to Adulthood.** Focuses on how education is related to adolescents' transition to adulthood in modern society. Examines the structure of schooling and the life course stages of adolescence and early adulthood, societal stratification, and intergenerational mobility. May be counted toward either the education specialization or the family specialization. Sociology 395E (Topic 3) and 396L (Topic: High School and Transition to Adulthood) may not both be counted.

**Topic 4: International Issues in Education.** Introduction to key theoretical and empirical work on education and social stratification from an international perspective. Focuses on studies of school access, educational attainment and achievement, and inequality of educational opportunity in Africa, Asia, and Latin America. Includes discussion of comparative and case study readings that explore specific themes such as education and social mobility, gender, race and ethnicity, and school contexts. May be counted toward the education specialization.

**Topic 5: Social Contexts of Education.** Explores school as a social context by delving into the informal processes of education, such as socialization and the organization of social relations. Includes discussion of the school as a site of social relations, social psychological influences on educational trajectories, and the social psychological consequences of educational experiences. May be counted toward the education specialization. Sociology 396L (Topic: Social Context of Education) and 395E (Topic 5) may not both be counted.

### SOC 395F. Seminars in Family.

Three lecture hours a week for one semester. Not all topics are offered every year. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 2: Marriage, Family, and Kinship.** May be counted toward the family specialization.

**Topic 3: Family and Health.** May be counted toward the family and health specializations.

**Topic 7: Aging and the Life Course.** Concepts and controversies about aging and the adult life course in the United States. Includes discussion of the biology of aging as it relates to current social issues and trends, population aging and related demographic trends, the economics and politics of aging, the trajectories and transitions of the adult life course, healthy aging, age as a social status, health care rights and responsibilities, retirement as a social institution, generational equity, and the conditions and choices at the end of life. May be counted toward the family specialization.

**Topic 8: Gender, Marital Status, and Well-Being.** Examines gender and relationships from social psychological perspectives. Considers how and why intimate relationships differ for men and women as well as the gendered consequences of relationships for mental and physical health. May be counted toward the family specialization. Sociology 395F (Topic 8) and 395G (Topic: Gender, Marital Status, and Well-Being) may not both be counted.

### SOC 395G. Seminars in Gender.

Three lecture hours a week for one semester. Not all topics are offered every year. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 3: Gender and Family.** Review of basic theoretical perspectives and empirical evidence concerning gender and family relationships. Considers how and why family relationships differ for men and women as well as the gendered consequences of relationships for men's and women's well-being. Includes discussion of marital status, marital transitions, marital quality, same sex intimate relationships, cohabiting relationships, and parent/child relationships. May be counted toward either the gender specialization or the family specialization.

**Topic 4: Gender and Health.** May be counted toward the gender and health specializations.

**Topic 5: Gender and Development.** May be counted toward the gender and development specializations.

**Topic 6: Gender and Work.** Examines theoretical and empirical issues regarding gender inequality in the labor market. Includes discussion of changes in female labor force participation, gender segregation in the workplace, gender gaps in earnings and promotions, as well as gender differences in career processes. May be counted toward either the gender specialization or the work, occupations, and organizations specialization.

**Topic 7: Feminist Theory.** Examines social categories such as the state, citizenship, nationalism, and globalization from a feminist perspective. May be counted toward either the gender specialization or the theory specialization. Sociology 394K (Topic: Feminist Theory) and 395G (Topic 7) may not both be counted.

**Topic 8: Readings in Gender and Sexuality.** Presents an overview of sociological theories of sexuality and provides a forum for discussion of recently published works in the sociology of gender and sexuality. May be counted toward the gender specialization.

**Topic 9: Gender and Society.** Examines the social construction of gender inequality, paying special attention to how divisions by race, class, and sexuality contribute to and occasionally undercut men's power and privilege over women. Emphasis is also placed on moments of resistance and change in gender arrangements. May be counted toward the gender specialization.

**Topic 10: Sociology of Sexual Violence.** Examines the different social forces and dynamics responsible for a variety of expressions of sexual violence existing in contemporary society. Designed to examine these processes promoting social violence from feminist-informed sociological perspectives; explore and analyze the historical, economic, and socio-cultural contexts responsible for these processes; study the issues and concerns with regard (but not limited) to gender, race and ethnicity, class, sexuality, and political activism associated with sexual violence research in the social sciences; and discuss and critique published sexual violence research based on qualitative methodologies across disciplines. May be counted toward the gender specialization.

**Topic 11: Qualitative Methods and Sexuality Research.** Examines major qualitative approaches to the study of sexuality from a sociological perspective; issues and concerns with regard to gender, race and ethnicity, class, same-gender sexualities, and activism associated with sexuality research in the social sciences; and published sexuality research based on qualitative methodologies. May be counted toward either the gender specialization or the statistics and methods requirement.

**Topic 12: Women and the Changing World of Work.** Explores the nature and causes of gender stratification in industrial societies. Examines theoretical and empirical issues regarding gender inequality in the labor market. Includes changes in female labor force participation, gender segregation in the workplace, gender gaps in earnings and promotions, and gender differences in career processes. Addresses how social institutions that vary from one country to

another shape men's and women's economic opportunities and the degree of gender inequality in the society. May be counted toward the gender specialization and the work, occupations and organizations specialization in the sociology department. Only one of the following may be counted: Public Affairs 388K (Topic: Women and the Changing World of Work), Social Work 395K (Topic: Women and the Changing World of Work), Sociology 395G (Topic: Women and the Changing World of Work), 395G (Topic 12), Women's and Gender Studies 393 (Topic: Women and the Changing World of Work).

### **SOC 395J. Seminars in Health.**

Three lecture hours a week for one semester. Not all topics are offered every year. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Sociology of Health and Illness.** May be counted toward the health specialization.

**Topic 6: Sociology of Mental Health.** Examines the social causes of mental health. Explores what mental health and mental illness are and how they can be measured, contrasting the social view with the medical, psychiatric, and psychological views. May be counted toward the health specialization.

**Topic 7: Health and the Life Course.** Health across the life course; the timing and sequencing of life-course experiences and events with respect to health. May be counted toward either the health specialization or the demography specialization.

**Topic 8: Biosocial Approaches to Health.** Examines the relationships between the natural and social environments and human health and behavior. Explains how disease, functional problems, and disability are not simply biomedical problems but are reflective of a complex array of behavioral factors and social forces. Focuses on the biologically informed sociological models of health in order to understand how genetics and major biological systems interact with social conditions and experiences to influence health and health-related behaviors. May be counted toward either the health specialization or the demography specialization.

**Topic 10: Structural Equations Modeling of Health and the Life Course.** May be counted toward the health specialization.

**Topic 12: Education, Socioeconomic Status, and Health.** Examines why people with higher socioeconomic status have better health than lower status individuals. Explores the links between aspects of social status and health and how education influences health in ways that are varied, present at all stages of adult life, cumulative, self-amplifying, and uniformly positive. May be counted toward the health specialization.

**Topic 13: Gender, Health, and Society.** Focuses on the gender dimensions of health, illness, and the medical care industry in the United States, with some international comparisons. Examines the role of women as major actors in changing the health-care system, reducing health risks for themselves and their families, and their roles as health-care providers, public administrators, and leaders in the health-care establishment. Also examines the role of different levels and branches of government and the relative power of key nongovernmental actors and the media in the formation of public policy and the definition and framing of our health agenda. May be counted toward either the health specialization or the gender specialization.

### **SOC 395L. Seminars in Race and Ethnicity.**

Sociological theories and findings concerning various aspects of race and ethnicity. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Comparative Perspectives in Race and Ethnicity.** May be counted toward the race and ethnicity specialization.

**Topic 8: Race, Media, and Culture.** May be counted toward the race and ethnicity specialization.

**Topic 9: Race and the Body.** Explores theories and research methodologies in the sociological study of the body, with a focus on race, racism, gender, and sexualities. May be counted toward either the race and ethnicity specialization or the theory specialization.

**Topic 10: Critical Theories on Race and Racism.** Introduction to global perspectives on race, ethnicity, and racism. Examines the historical relationship between the emergence of ideas about race and Western modernity: importance of slavery and European colonialism in producing modern understandings of race and racial difference; contemporary racial formation in the period after the anticolonial struggles of the mid-twentieth century. May be counted toward the race and ethnicity specialization or the theory specialization. Sociology 394K (Topic: Critical Theories on Race and Racism) and 395L (Topic 10) may not both be counted.

### **SOC 396L. Seminars in Work, Occupations, and Organizations.**

The equivalent of three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 10: Stratification and Social Mobility.** May be counted toward the work, occupations, and organizations specialization.

**Topic 15: Nongovernmental Organizations in the Developing World.** Explores how nongovernmental organizations reflect local and international initiatives related to human rights, the environment, sustainable development, health, education, and much more. May be counted toward the work, occupations, and organizations specialization.

**Topic 16: Sociology of Poverty in the United States.** Review of selected sociological literature on poverty and related aspects of inequality, mostly in the United States but with some comparisons made with other developed nations. Both quantitative and qualitative research on American poverty are considered. May be counted toward the work, occupations, and organizations specialization.

**Topic 17: Entrepreneurship and Incubation.** May be counted toward the work, occupations, and organizations specialization.

### **SOC 396N. Seminars in Crime, Law, and Deviance.**

Substantive issues and current topics in the study of crime, law, and deviance. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Criminology.** Examines major topics in the social scientific study of crime, including the measurement of crime, profiles of criminals, criminal behavior across the life course, and public perceptions of and reactions to crime. May be counted toward the crime, law and deviance specialization.

**Topic 2: Theories of Crime Causation.** Focuses on the major theories of criminal behavior and whether and in what ways empirical data support or refute various theoretical perspectives. May be counted toward the crime, law, and deviance specialization.

**Topic 3: Criminal Justice.** Designed to provide an overview of research on how the penal system works in practice by examining the empirical literature on sentencing, prisons, recidivism, and evaluation research of penal programs. May be counted toward the crime, law, and deviance specialization.

**Topic 4: Introduction to Law and Society.** Focuses on the noncrime aspects of the legal system, especially civil justice; the pursuit of perceived legal entitlements and grievances; studies of legal professionals and legal decision makers; and the use of the legal system to advance social change. May be counted toward the crime, law, and deviance specialization.

**Topic 5: Law, Legitimacy, and Control.** Explores the interconnections between law, morality, and the sense of injustice. Examines the attributes of a moral system as they influence the collective assessment of legitimacy, the emergence of social

movements for reform, and the resulting efficacy of law as an instrument of control. May be counted toward either the crime, law, and deviance specialization or the political sociology specialization.

**Topic 6: Deviance.** Examines the characteristics, causes of, and societal reactions to several types of deviant behavior. May be counted toward the crime, law, and deviance specialization. Sociology 396M (Topic 6: Deviance) and 396N (Topic 6) may not both be counted.

### **SOC 396P. Seminars in Political Sociology, Development, and Globalization.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Political Sociology.** May be counted toward the political sociology specialization.

**Topic 2: Social Movements.** May be counted toward the political sociology specialization.

**Topic 3: Social Change.** May be counted toward the political sociology specialization.

**Topic 6: Elites.** Same as Government 390L (Topic 10: Elites). May be counted toward the political sociology specialization in the sociology degree program.

**Topic 7: Peace, Conflict, and Violence.** May be counted toward the political sociology specialization.

**Topic 8: Cultural Sociology.** May be counted toward the political sociology and religion specializations.

**Topic 9: Economic Development and Social Change.** May be counted toward the political sociology, development, and globalization specialization. Sociology 395D (Topic 1) and 396P (Topic 9) may not both be counted.

**Topic 10: Introduction to the Sociology of Latin America.** Same as Latin American Studies 381 (Topic 14). Only one of the following may be counted: Latin American Studies 381 (Topic 14), Sociology 395D (Topic 2), 396P (Topic 10). May be counted toward the political sociology/development and globalization specialization in the sociology degree program.

**Topic 11: Mexican Political System in Transition.** May be counted toward the political sociology, development and globalization specialization. Sociology 395D (Topic 3) and 396P (Topic 11) may not both be counted.

**Topic 12: Gender and Politics.** Provides a comprehensive introduction to the history of women's entry into politics internationally, the current state of women's political representation across countries and regions, and contemporary debates on why and how women's access to political power varies across countries. May include discussion of the ways in which gender intersects with other social identities, such as race, ethnicity, class, and sexual orientation. May be counted toward either the political sociology specialization or the gender specialization.

**Topic 13: Housing Practices and Public Policy in Latin America.** Same as Latin American Studies 381 (Topic 6). May be counted toward the political sociology, development and globalization specialization in the sociology degree program. Only one of the following may be counted: Sociology 395D (Topic 5), 396P (Topic 13), Latin American Studies 381 (Topic 6).

**Topic 14: Citizenship and Social Policy.** May be counted toward the political sociology, development and globalization specialization. Sociology 395D (Topic 7) and 396P (Topic 14) may not both be counted.

**Topic 15: Economic Sociology.** May be counted toward the political sociology, development and globalization specialization. Sociology 395D (Topic 8) and 396P (Topic 15) may not both be counted.

**Topic 16: Urbanization.** May be counted toward the political sociology, development and globalization specialization. Sociology 395D (Topic 9) and 396P (Topic 16) may not both be counted.

**Topic 17: Poverty and Marginality in the Americas.** Same as Latin American Studies 381 (Topic 23). Review of the past and present ethnographic analyses of the nature and experiences of poverty and marginality in Latin America and in the United States. Examines some of the most controversial issues and debates, and explores emerging research topics north and south of the border. May be counted toward the sociology department's political sociology, development and globalization specialization in the sociology degree program. Only one of the following may be counted: Latin American Studies 381 (Topic: Poverty and Marginality in the Americas), 381 (Topic 23), Sociology 395D (Topic: Poverty and Marginality in the Americas), 396P (Topic 17).

**Topic 18: Social Capital and Social Networks.** Same as Radio-Television-Film 380G (Topic 2). Explores theories, methods, and applications, drawing on literatures from sociology, communication, media studies, and management. Examines the relational and structural embeddedness of actors, communities, and organizations, and focuses on how to collect network data and do network analysis. May be counted toward the political sociology, development and globalization specialization in the sociology degree program. Only one of the following may be counted: Radio-Television-Film 380G (Topic: Social Capital and Social Networks), 380G (Topic 2), Sociology 396P (Topic: Social Capital and Social Networks), 396P (Topic 18).

**Topic 19: Bourdieu and the Craft of Sociology.** Examines Bourdieu's key notions as they become articulated in the craft of research and writing in his work, and that of others, with an underlying objective of learning how to think and conduct sociological research with or against Bourdieu. May be counted toward the political sociology, development and globalization specialization. Sociology 396P (Topic: The Uses of Theory: Bourdieu and the Craft of Sociology) and 396P (Topic 19) may not both be counted.

### **SOC 396Q. Seminars in Law and Human Rights.**

Theory and research on those instances in which legal regimes and/or legal institutions, such as prisons, raise human rights issues. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **SOC 397D. Publishing Papers in Sociology.**

Three lecture hours a week for one semester. May be counted toward elective requirements. Prerequisite: Graduate standing.

### **SOC 397P. Proseminar.**

A review of the requirements and responsibilities of professional sociologists. Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in sociology.

### **SOC 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in sociology, twelve semester hours of graduate coursework in sociology, and consent of the graduate adviser; for 698B, Sociology 698A.

### **SOC 398T. Supervised Teaching in Sociology.**

Teaching under the close supervision of the course instructor for two semesters; weekly group meetings with the instructor, individual consultations, and reports throughout the teaching period. Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **SOC 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

## **SOC 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Sociology 399R, 699R, or 999R.

# **Women's and Gender Studies**

*Master of Arts*

## **For More Information**

**Campus address:** Burdine Hall (BUR) 536, phone (512) 471-5765, fax (512) 475-8146; campus mail code: A4900

**Mailing address:** The University of Texas at Austin, Graduate Program, Center for Women's and Gender Studies, 2505 University Avenue Stop A4900, Austin TX 78712

**E-mail:** [cwgs@austin.utexas.edu](mailto:cwgs@austin.utexas.edu)

**URL:** <http://www.utexas.edu/cola/centers/cwgs/>

The mission of the Center for Women's and Gender Studies (CWGS) is to develop committed communities that address challenges in the areas of gender, sexuality, diversity, and equity, through interdisciplinary research, undergraduate and graduate teaching, and social advocacy. The center's vision is to be a world-class center for interdisciplinary research, teaching, and activism in women's and gender studies.

## **Facilities for Graduate Work**

The Center for Women's and Gender Studies, which administers the master's degree program in women's and gender studies, is a campus-wide interdisciplinary program with almost three hundred affiliated faculty members from almost all colleges and schools. The center hosts a major lecture series or scholarly conference each year and its annual Emerging Scholarship in Women's and Gender Studies Conference in which graduate and undergraduate students present their work.

The University offers several unique resources for interdisciplinary and cross-cultural research in women's and gender studies. Students and faculty have the support and collaboration of a dedicated Women's and Gender Studies/LGBTQ Studies Librarian at the University Libraries. The Harry Ransom Center includes celebrated rare book and manuscript collections in American and modern literature, including letters by Radclyffe Hall and the papers of Una Troubridge; papers of twentieth-century authors including Anne Sexton and Julia Alvarez; papers, including diaries and recipes, reflecting women's daily life; artwork, including Frida Kahlo's *Self-Portrait with Thorn Necklace and Hummingbird* (1940), as well as the photographs of Victorian photographer Julia Margaret Cameron; and more, as reflected on the HRC's Women's Studies area guide. The Nettie Lee Benson Latin American Collection is one of the world's great collections of materials in Latin American, Mexican American, and Latino studies. Archival collections at the Benson include the materials of queer Chicana feminist author Gloria E. Anzaldúa, Texan author of *Borderlands/La Frontera: The New Mestiza*; letters of Nobel-prize winning Chilean author and diplomat Gabriela Mistral; materials of internationally-renowned Austin musician Tish Hinojosa; and the papers of the National Latino/a Lesbian and Gay Organization. The Dolph Briscoe Center for American History holds the largest collection of extant historical manuscripts dealing with Texas, including the Black Texas Women Archive of materials and oral histories gathered by Austin-based historian Ruthe Winegarten; the papers of Frances (Sissy) Tarlton Farenthold, Texas-based international advocate for human rights who visited Greenham Commons and was nominated to be the Democratic candidate for the US vice presidency; the Lesbian Issues Collection of journals (1975-1991) and two letters by Rita Mae Brown; and the papers of various Austin and Texas feminist and women's

organizations including the Center for Women's and Gender Studies and the Austin Chapter of the National Organization for Women. Various locations in the University Libraries house microfilm sets of archival collections of advocates and organizations, including those of feminist organizing in Brazil, diaries of regional groups of women in the nineteenth century, Eleanor Roosevelt, Margaret Sanger, and Elizabeth Cady Stanton. The University Libraries developed the Black Queer Studies Collection, a virtual collection that makes visible the libraries' substantial holdings in black diasporic queer materials. The Women's and Gender/LGBTQ Studies Librarian (<http://www.lib.utexas.edu/subject/gender>) provides additional information about women's studies holdings.

Convenient to the University are other research facilities, including the Lyndon Baines Johnson Library and Museum, the Texas State Library and Archives, and the Austin History Center. The Austin History Center houses archives of local advocates and organizations, including the Texas Statewide Queer People of Color Organization, and has research guides for materials on women's resources, African American sources, Asian American sources, Mexican American sources, and more.

## **Areas of Study**

Women's and gender studies comprises research or creative work that raises new questions, formulates theories, or carries out empirical investigations that further understanding of science, social science, history, the humanities and arts, education, public and social policy, and paradigms of knowledge in applied and professional fields in such a way that women and gender systems are brought to the center of scholarship. Students pursue disciplinary and interdisciplinary research or creative work that prepares them for research or professional careers in which knowledge about women and gender is crucial. Students who complete the program graduate with a greater understanding of the field of women's and gender studies; an understanding of and commitment to resisting interlocking oppressions; critical knowledge of women's human rights; and scholarly connections to the center's faculty. The master's degree in women's and gender studies is excellent preparation for further training in public policy, social work, health care, education, the arts, technology, and business. It also prepares graduates to pursue doctoral work in a traditional discipline or in women's and gender studies at another institution.

## **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Kamran Ali  
Samer M Ali  
Jacqueline L Angel  
Katherine M Arens  
Marilyn Armour  
Lucinda Jane Atkinson  
Germine H Awad  
Hina Azam  
Phillip J Barrish  
Kirsten L Belgum  
Mary C Beltran  
Chad J Bennett  
Rebecca Bigler  
Mary A Bock  
Daniel A Bonevac  
Pascale R Bos  
Keffrelyn D Brown  
Simone A Browne  
Virginia Garrard Burnett  
Noel B Busch-Armendariz  
Jessica Duncan Cance  
Charlotte Canning  
Ben Carrington  
Mia E Carter  
Shannon E Cavanagh  
Mounira M Charrad  
Ruramisai Charumbira  
Dana L Cloud  
Judith G Coffin  
David F Crew  
Elizabeth Cullingford  
Ann Cvetkovich  
Janet M Davis  
Susan De Luca  
Mercedes L De Uriarte  
Andrew F Dell'Antonio  
Diana M Dinitto  
Marlene A Dixon  
Hector Dominguez-Ruvalcaba  
Philip Doty  
Karen L Engle  
Melanie Diane Feinberg  
Laura J Furman  
Dorie J Gilbert  
Gloria Gonzalez-Lopez  
Darlene Grant  
Laurie B Green  
Benjamin G Gregg  
Nicole Marie Guidotti-Hernandez  
Sabine Hake  
Daniel S Hamermesh  
Julie Hardwick  
Barbara J Harlow  
Tracie C Harrison  
Mark D Hayward  
Elizabeth A Hedrick  
Susan S Heinzelman  
Geraldine Heng  
Kathleen M Higgins  
Neville Hoad  
Carole K Holahan  
Juliet A Hooker  
Madeline Y Hsu  
Thomas K Hubbard  
Aletha C Huston

Robert W Jensen  
Jacqueline Jones  
Omi Osun Joni L Jones  
Elizabeth L Keating  
Su Yeong Kim  
Sara E Kimball  
Philippa Judith Levine  
Xavier Livermon  
Carol H MacKay  
Michael S Mackert  
Madhavi Mallapragada  
Mollie T Marchione  
Jill A Marshall  
Martha Menchaca  
Sofian Merabet  
Julia L Mickenberg  
Gail Minault  
Julie A Minich  
Lisa L Moore  
Fehintola A Mosadomi  
Gretchen Murphy  
Joan H Neuberger  
Mary C Neuburger  
Martha G Newman  
Cynthia Osborne  
Yolanda C Padilla  
Shelley M Payne  
Julia A Reed  
Donna L Rew  
Ann M Reynolds  
Matt T Richardson  
Victoria E Rodriguez  
Loriene Roy  
Sharmila Rudrappa  
Nancy Schiesari  
Sonia T Seeman  
Martha A Selby  
Alissa R Sherry  
Faegheh S Shirazi  
Patricia A Somers  
Shannon Speed  
Nancy K Stalker  
Joseph Straubhaar  
Pauline T Strong  
Sharon L Strover  
Catherine A Surra  
Eric Tang  
Kevin D Thomas  
Gayle M Timmerman  
Natasha Tinsley  
Janice S Todd  
Rebecca M Torres  
Ann Twinam  
Anita L Vangelisti  
Kamala Visweswaran  
Lorraine O Walker  
Samuel C Watkins  
Jo Lynn Westbrook  
Karin G Wilkins  
Lynn R Wilkinson  
Jennifer M Wilks  
Christine L Williams  
Zipporah B Wiseman  
Hannah C Wojciehowski  
Helena Woodard

Ted L Huston

## Admission Requirements

An admission committee composed of Graduate Studies Committee members evaluates all applications. The committee seeks to admit a small, dynamic group of students who will make a difference in the community, both in and outside of academia. The limited size of the incoming cohort allows the program to provide each student with personal attention and fosters a sense of community among students and faculty members.

The Admissions Committee looks for candidates with an understanding of women's and gender studies as a field, commitment to antiracist feminist practice, a strong academic background, and a clear sense of the topics or areas they wish to pursue during the two-year master's degree. The Center for Women's and Gender Studies depends on students to be activists and leaders in the community. The Admissions Committee also looks for students who will not only attend class but also attend workshops and conferences, form organizations, volunteer, and participate in extracurricular activities.

A complete list of required application materials is published by the Center for Women's and Gender Studies (<http://www.utexas.edu/cola/centers/cwgs/degree-programs/graduate-program/admissions.php>).

## Graduate Portfolio Program

The women's and gender studies graduate portfolio program is open to all graduate students at the University of Texas at Austin. It offers graduate students from all disciplines an opportunity to incorporate women's and gender studies into their degree programs. Students may enter the program at any point in their graduate work, but it is recommended that they do so as soon as they decide to pursue the portfolio.

The program builds upon the Center's rich and broad-based expertise across disciplines and colleges/schools. Portfolio students develop a specialization unique to their own program of work through women's and gender studies courses, scholarly papers, and presentations.

Once all portfolio requirements are completed and the student's graduate degree is awarded, their official University transcript will indicate completion of the graduate portfolio in women's and gender studies.

In addition, interested students may receive an in-house certificate for the "WGS Portfolio Program with LGBTQ/Sexualities Track" by taking courses identified as having LGBTQ (lesbian, gay, bisexual, transgender, queer) studies content. This list of courses is known as the "Pink Book," and is published on the Women's and Gender Studies Web site.

Requirements and application information is available online (<http://www.utexas.edu/cola/centers/cwgs/degree-programs/graduate-program>).

## Graduate Seminar Courses

The Center for Women's and Gender Studies offers an interdisciplinary program that focuses on understanding women's experiences from a variety of perspectives and on the role gender plays in shaping society. The program's large and diverse faculty draws on the scholarship of more than 270 distinguished faculty members from twenty-nine departments and fourteen colleges and schools. Women's and Gender Studies 393, *Seminar: Topics in Women's and Gender Studies*, provides access to cutting-edge scholarship from multiple perspectives by offering topics from nearly every graduate discipline. The program's faculty affiliates offer as many as thirty different seminar classes every semester.

## Degree Requirements

Students pursuing a master's degree in women's and gender studies (WGS) may write either a thesis or a report at the end of their coursework. The thesis option requires thirty-six semester hours of coursework, of which six hours are earned in the thesis course. The report option requires thirty-six semester hours of coursework, of which three hours are earned in the report course.

All students must complete the following three core foundations courses in their first year: Women's and Gender Studies 390, *Introduction to Women's and Gender Studies*, Women's and Gender Studies 391, *Feminist Theories*, and Women's and Gender Studies 392, *Research Methods Seminar in Women's and Gender Studies*. Students are required to meet weekly with the graduate adviser during their second year.

In addition, each student must demonstrate competence in the research skills appropriate to the student's overall academic and career objectives and to the final thesis or report. A minimum of four additional courses related to women, gender, sexuality, or feminism may be selected from the extensive offerings of faculty members affiliated with the Center for Women's and Gender Studies. Other courses may be substituted with the graduate adviser's approval.

All WGS students must also present their work at least once during the Annual Emerging Scholarship in Women's and Gender Studies Graduate Student Conference.

## Dual Degree Programs

The Center for Women's and Gender Studies offers the following dual degree programs in cooperation with other divisions of the University. More information is available from the graduate adviser in each program.

Field(s) of Study	Degree(s)
Information studies	Master of Science in Information Studies
Public affairs	Master of Public Affairs

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Women's and Gender Studies: WGS

#### WGS 384N. Internship in Women's and Gender Studies.

Practical working involvement with participating nonprofit and research agencies. The equivalent of ten class hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the graduate adviser.

#### WGS 390. Introduction to Women's and Gender Studies.

Introduction to the interdisciplinary women's and gender studies graduate program. Three lecture hours and one hour-long faculty colloquium a week for one semester. Offered in the fall semester only. Prerequisite: For master's students in women's and gender studies, graduate standing; for others, graduate standing and consent of instructor.

#### WGS 391. Feminist Theories.

Selected readings of feminist theories from an interdisciplinary perspective. Three lecture hours a week for one semester. Offered in the fall semester only. Prerequisite: For master's students in women's and gender studies, graduate standing and Women's and Gender Studies 390; for others, graduate standing and consent of instructor.

#### WGS 392. Research Methods Seminar in Women's and Gender Studies.

Introduction to select feminist research methods used in various disciplines and how these methods inform interdisciplinary perspectives in the student's own field of study in preparation for a report, thesis, or dissertation. Three lecture hours and one hour-long faculty colloquium a week for one semester. Prerequisite: For master's students in women's and gender studies, graduate standing and Women's and Gender Studies 390 and 391; for others, graduate standing and consent of instructor.

#### WGS 393. Seminar: Topics in Women's and Gender Studies.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser. Additional prerequisites vary with the topic and are given in the Course Schedule.

#### WGS 394. Conference Course in Women's and Gender Studies.

Individual directed readings and conferences on selected problems or topics in women's and gender studies. Conference course. May be repeated for credit. Prerequisite: Graduate standing and consent of the graduate adviser.

#### WGS 195. Special Projects in Women's and Gender Studies.

Interdisciplinary projects to support the women's and gender studies graduate student coursework. One lecture hour a week for one semester, with additional hours to be arranged. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in women's and gender studies, six semester hours of graduate coursework in women's and gender studies, and consent of the graduate adviser.

#### WGS 698. Thesis.

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in women's and gender studies and consent of the graduate adviser; for 698B, Women's and Gender Studies 698A.

#### WGS 398R. Master's Report.

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in women's and gender studies and consent of the graduate adviser.

## College of Natural Sciences

### Astronomy

Master of Arts  
Doctor of Philosophy

### For More Information

**Campus address:** Robert Lee Moore Hall (RLM) 15.204, phone (512) 471-0481, fax (512) 471-6016; campus mail code: C1400



**Mailing address:** The University of Texas at Austin, Department of Astronomy, Graduate Program, 2515 Speedway C1400, Austin TX 78712

**E-mail:** studentinfo@astro.as.utexas.edu

**URL:** <http://www.as.utexas.edu/>

## Facilities for Graduate Work

Facilities for research in astronomy are located on the campus in Austin, at the McDonald Observatory in West Texas, and at the California Institute of Technology Submillimeter Observatory on Mauna Kea, Hawaii. Equipment in Austin includes a 16-inch reflector and several smaller telescopes. In addition to the facilities of Information Technology Services, a dedicated Sun Enterprise 3501 server, one hundred Sun workstations, and numerous desktop computers serve the Department of Astronomy and McDonald Observatory for data reduction and analysis, image processing, and other computer needs. The department operates an electronics shop, engineering and instrumentation laboratories, and a well-stocked research library. The Kuehne Physics Mathematics Astronomy Library is located in Robert Lee Moore Hall.

Facilities for research at McDonald Observatory include the 2.7-m reflector, which has Cassegrain and coudé foci and a variety of auxiliary instruments, including Cassegrain and coudé spectrometers equipped with digital detectors. The telescope is supplemented by a versatile computer system. The 2.1-m Struve reflector is used at the Cassegrain focus, or with a large spectrograph at the coudé focus. Cassegrain instrumentation includes a low-resolution spectrograph with linear detectors, direct and intensified cameras, two-channel high-speed photometers, a polarimeter, and a Fabry-Pérot interferometer.

The Hobby-Eberly telescope is a composite mirror instrument with an effective aperture of about 8.5-m, intended primarily for spectroscopic work. A low-resolution spectrograph, a medium-resolution spectrograph, and a high-resolution spectrograph are available and provide useful data. Two smaller reflectors, 0.9-m and 0.8-m, are used primarily for photoelectric photometry and charge-coupled device surveys. An excellent library is maintained for research and instruction, and other facilities include darkrooms, instrument and machine shops, and transient quarters.

The 10-m submillimeter-wavelength radio telescope built by the California Institute of Technology on Mauna Kea, Hawaii, is also used by faculty members and students in astronomy; three weeks a year are dedicated to University of Texas at Austin research. This research involves primarily the study of radiation from interstellar molecules and dust; it also includes the development of novel instrumentation.

## Areas of Study

Graduate instruction and research are conducted in observational astronomy and astrophysics. Observational opportunities are available in conventional photometry, polarimetry, and fast photometry of stellar oscillations; spectroscopy and spectrophotometry of planets, stars, nebulae, galaxies, and quasars; galactic and extragalactic research; planetary and cometary studies; infrared and millimeter astronomy; radio astronomy and instrumentation; and space astronomy. There are also instruction and research opportunities in theoretical astrophysics, including the origin of the elements, celestial mechanics, cosmology, stellar structure and evolution, stellar atmospheres, and interstellar material. There are opportunities for cooperative interdepartmental research with groups in the Department of Physics and the Department of Aerospace Engineering and Engineering Mechanics.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Taft E Armandroff	Pawan Kumar
Volker Bromm	John H Lacy
William D Cochran	David L Lambert
Harriet L Dinerstein	Milos Milosavljevic
Neal J Evans II	Edward L Robinson
Steven Lyle Finkelstein	John M Scalzo
Karl Gebhardt	Paul R Shapiro
Gary J Hill	Christopher A Sneden
Daniel T Jaffe	Steven Weinberg
Shardha Jogee	John C Wheeler
John Kormendy	Derek Wills
Adam L Kraus	Don Winget

## Admission Requirements

Prerequisites for graduate work in astronomy are at least fifteen to eighteen semester hours of upper-division coursework in astronomy and physics, including courses in mechanics, electricity and magnetism, statistical physics, and quantum mechanics; and a satisfactory score on the Graduate Record Examinations Physics Test. The Physics Test must be taken in addition to the General Test of the Graduate Record Examinations, which is required for admission to the Graduate School. An applicant who does not present a satisfactory score on the Physics Test may, on recommendation of the Graduate Studies Committee, be granted a conditional admission to the program requiring removal of deficiencies in physics. A detailed evaluation is made of each new student's physics and astronomy background to identify any deficiencies that should be removed.

## Degree Requirements

### Master of Arts

Students must complete six of the following introductory courses: Astronomy 380E, 381C, 382C, 383C, 383D, 386C, 392D, 392J, 393F, 396C. Students must also complete two elective courses; the electives may include additional courses from the aforementioned group. At least thirty-three semester hours, including Astronomy 698A and 698B, are required.

Students begin research during their first year. Research is done under the supervision of an adviser and committee and normally takes a year and a half. Upon completing an acceptable research project and thesis, the student is awarded a degree.

### Doctor of Philosophy

Students must earn a grade of at least *B-* in seven of the following required courses: Astronomy 380E, 381C, 382C, 383C, 383D, 386C, 392D, 392J, 393F, 396C. They must also complete two elective courses; the electives may include additional courses from the aforementioned group. In addition, they are required to attend the Seminar for First Year Astronomy Graduate Students in the fall of their first year of attendance.

Students begin research during their first year. Research is done under the supervision of an adviser and committee and normally takes four to five years. In the spring of their second year, students must present their research to date and pass an oral qualifying examination. They must apply for admission to candidacy by the end of the summer of the second year. Two presentations on research must be given in colloquia or

seminars. Finally, the student must complete the dissertation and pass an oral examination on the dissertation.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Astronomy: AST

#### **AST 380E. Radiative Processes and Radiative Transfer.**

Classical and quantum radiative processes relevant to astrophysics; basic radiative transfer. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### **AST 381. Topics in Theoretical Astrophysics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### **AST 381C. Gravitational Dynamics.**

Orbital, collective, and tidal effects of astronomical objects, such as planets, stars, galaxies, and interstellar medium, under the influence of a gravitational field. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### **AST 381S. Seminar in Theoretical Astrophysics.**

Topics to be announced. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

#### **AST 382C. Astrophysical Gas Dynamics.**

The basic principles of compressible gas dynamics and magnetohydrodynamics, developed and applied in an astrophysical context to a wide range of astronomical phenomena. Three lecture hours a week for one semester. Prerequisite: Graduate standing in astronomy or physics, or graduate standing and consent of instructor.

#### **AST 383. Topics in Stellar Astronomy.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### **AST 383C. Stellar Atmospheres.**

Observational properties of stellar atmospheres; theoretical calculations of stellar atmospheres and stellar spectra. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### **AST 383D. Stellar Structure and Evolution.**

Theoretical calculations of the structure and evolution of stars. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### **AST 383L. Seminar in Planets and Life.**

Discussions concerning the solar system; the detection, formation, and evolution of planets; planetary atmospheres, climates, and meteorology; and various aspects of life in the universe. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

#### **AST 383T. Seminar in Stellar Astronomy.**

Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

#### **AST 384T. Current Studies in Astronomy for Teachers.**

Lectures and laboratory work in astronomy for elementary and secondary school teachers of earth science, physical science, or astronomy. Three lecture hours and twelve laboratory hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### **AST 385. Conference Course.**

Three conference hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

#### **AST 185C. Conference on Modern Astronomy.**

A broad introduction to the research being conducted by the faculty and research staff in astronomy. One lecture hour a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### **AST 386. Extragalactic Astronomy.**

Topics include classification of galaxies, distance indicators, luminosities, dimensions, colors, spectra, polarization, radio emission, rotation, masses; formation and evolution; pairs, groups, clusters, superclusters, large-scale distribution, redshifts, cosmology. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

#### **AST 386C. Properties of Galaxies.**

Observational properties of galaxies and their interpretation; includes a discussion of the Milky Way galaxy. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### **AST 386S. Seminar in Extragalactic Astronomy.**

Topics to be announced. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

#### **AST 389. Dynamical Astronomy.**

Topics include planetary and stellar motions, asymptotic representations of quasi integrals, galactic dynamics. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

#### **AST 391. Graduate Research in Astronomy.**

Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in astronomy and consent of instructor.

#### **AST 392D. Mathematical Methods of Astrophysics.**

Statistics, error theory, least squares and curve fitting, numerical methods, approximation theory, Fourier transforms, sampling theory, time-series analysis. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### **AST 392E. Optical Techniques in Astronomy.**

Topics include photometry, spectroscopy, direct imaging, interferometry and polarimetry at ultraviolet, visual, and infrared wavelengths. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

#### **AST 392G. Observing Techniques in Astronomy.**

Survey of techniques used at the McDonald Observatory. Includes workshop at the observatory. Three lecture hours a week for one

semester. Offered in the summer session only. Prerequisite: Graduate standing and consent of instructor.

### **AST 392J. Astronomical Instrumentation.**

A hands-on course in instrument development, including mechanical design and machining, electronics design, optical design and optics, computer interfacing, and project planning. Students use CAD programs in each area and design and build a computer-controlled instrument. Learning activities are carried out in groups and teams. One lecture hour and five laboratory hours a week for one semester. Prerequisite: Graduate standing.

### **AST 393F. Survey of the Interstellar Medium.**

A broad introduction to the processes and properties of the interstellar medium. Topics include H I regions, H II regions, molecular clouds, interstellar dust, and the distribution of the interstellar medium in our galaxy. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **AST 393S. Seminar in Interstellar Matter.**

Topics to be announced. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **AST 396C. Elements of Cosmology.**

A theoretical discussion of the origin and evolution of the universe; includes a brief review of general relativity and modern particle physics. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **AST 697. Graduate Research Project.**

Two-semester graduate research project in astronomy. The equivalent of three hours of work a week for two semesters. Prerequisite: For 697A, graduate standing and consent of instructor; for 697B, Astronomy 697A.

### **AST 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in astronomy and consent of the graduate adviser; for 698B, Astronomy 698A.

### **AST 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in astronomy and consent of the graduate adviser.

### **AST 398T. Supervised Teaching in Astronomy.**

Effective astronomy teaching: course design, instructional materials, test design, other methods. In-class practice teaching. Projects in astronomy education. Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and current or previous appointment as a teaching assistant.

### **AST 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **AST 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Astronomy 399R, 699R, or 999R.

## **Biochemistry**

*Master of Arts*

*Doctor of Philosophy*

## **For More Information**

**Campus address:** Norman Hackerman Building (NHB) 2.632, phone (512) 471-4181, fax (512) 232-3699; campus mail code: A6500

**Mailing address:** The University of Texas at Austin, Graduate Coordinator for Biochemistry, 100 East 24th Street A6500, Austin TX 78712

**E-mail:** [jjgilmore@austin.utexas.edu](mailto:jjgilmore@austin.utexas.edu)

**URL:** [www.icmb.utexas.edu/Biochemistry](http://www.icmb.utexas.edu/Biochemistry)

## **Areas of Study**

Graduate study in biochemistry is offered in a wide range of areas including drug metabolism; nutritive aspects of human disease; metabolic regulation; structure and function of enzymes, toxins, and contractile proteins; mechanism and regulation of protein biosynthesis; cloning, sequencing, and site-directed mutagenesis of enzyme-coding genes; enzymology of DNA repair and replication; and biochemical taxonomy. Details are available from the graduate adviser.

## **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Hal S Alper	Seongmin Lee
Eric V Anslyn	Hung-Wen Liu
Dean R Appling	Edward M Marcotte
Jeffrey E Barrick	Stephen F Martin
Karen S Browning	Andreas T Matouschek
Lydia Maria Contreras	Mikhail V Matz
Richard M Crooks	Jennifer A Maynard
Kevin N Dalby	Edward M Mills
Ron Elber	Somshuvra Mukhopadhyay
Andrew Ellington	Tanya T Paull
Walter L Fast	Shelley M Payne
Ilya J Finkelstein	Pengyu Ren
Richard H Finnell	Austen F Riggs II
George Georgiou	Jon D Robertus
Marvin L Hackert	Rick Russell
Rasika M Harshey	Jason B Shear
David W Hoffman	Scott W Stevens
Jon M Huibregtse	Christopher S Sullivan
Brent L Iverson	Michael Stephen Trent
Arlen W Johnson	Lauren J Webb
Kenneth Johnson	Marvin Whiteley
Adrian T Keatinge-Clay	Christian P Whitman
Sean M Kerwin	Claus O Wilke
Robert M Krug	Blerta Xhemalce
Alan Lambowitz	Yan Zhang

## **Admission Requirements**

Students seeking a graduate degree in biochemistry must have a bachelor's degree or the equivalent in a cognate area, such as chemistry, biology, physics, or microbiology with the following preparation: mathematics through one year of calculus; chemistry, including organic chemistry, biochemistry, and physical chemistry; general physics; and biology, including cell biology. Deficiencies in undergraduate courses, if not too extensive, may be corrected during the student's first two semesters in the graduate program. These courses are usually not counted toward graduate degrees.

# Degree Requirements

## Master of Arts

Master's degree students must complete at least thirty semester hours of coursework and must submit a thesis based on individual research. The thesis course may be counted as six of the thirty semester hours required for the degree. A minor of at least six semester hours is required, which may be in another area of chemistry, such as organic or physical chemistry, or in a related discipline, such as biology. No more than nine semester hours of upper-division coursework may be counted; these hours must be divided between the major and the minor field, with no more than six hours in the major field and three in the minor.

Courses required for the major in biochemistry are: Biochemistry 387D, 394, 395G, and 395J. Most students take two and one-half years to earn the Master of Arts.

## Doctor of Philosophy

For admission to candidacy for the doctoral degree, a student must complete the following courses with a grade of at least *B-* in each: Biochemistry 387D, 394, 395G, and 395J. Students are also required to complete two elective courses. Electives should be graduate level science courses in biochemistry, chemistry, medicinal chemistry, microbiology, physics, or related fields. Upper-level undergraduate science courses in areas outside of biochemistry may be used as electives, if appropriate for the student's scientific development, with the approval of the graduate adviser. Students must complete Biochemistry 192G six times and make five presentations, which is normally accomplished by the end of the third year of the graduate program. A qualifying examination designed to test the student's knowledge of the basic principles of biochemistry must be completed within the first two years. A major part of this examination consists of a research proposal written in the form used for a National Institutes of Health grant application. The student presents and defends this proposal orally and is examined in terms of his or her ability to do independent research.

After the requirements for admission to candidacy have been completed, the chair of the Graduate Studies Committee petitions the dean of the Graduate School to appoint a dissertation committee. A student must do dissertation research under the supervision of a member of the Graduate Studies Committee. Generally this faculty member, chosen by mutual consent of the student and the professor, serves as chair of the dissertation committee.

## Dual Degree Program

### Doctor of Philosophy/Doctor of Medicine

The dual degree program between the University of Texas at Austin and the University of Texas Medical Branch at Galveston is no longer accepting students. A new MD/PhD program between the University and the Dell Medical School will take its place in the future. Additional information may be found here (<http://www.mdphd.utexas.edu>).

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## Biochemistry: BCH

### BCH 080M. Dual MD/PhD Program with UT Medical Branch.

Preclinical medical study at the University of Texas Medical Branch at Galveston. May not be taken concurrently with another course at the University of Texas at Austin. Prerequisite: Graduate standing and admission to the MD/PhD dual degree program in biochemistry.

### BCH 381D. Structure-Aided Drug Discovery.

Investigation of structure-based drug design subjects including the modern model of drug discovery in pharmaceutical and biotech companies, high-throughput Assay development, structure-aided drug discovery, case studies of hot targets, and hands-on experience with docking program. Three lecture hours a week for one semester. Biochemistry 381D and Chemistry 391L (Topic: Structure-Based Drug Design) may not both be counted. Prerequisite: Graduate standing.

### BCH 387D. Physical Methods in Biochemistry and Molecular Biology.

Theory of physical methods used in biochemistry and molecular biology. Three lecture hours a week for one semester. Prerequisite: Graduate standing, an undergraduate course in physical chemistry, and an undergraduate course in biochemistry.

### BCH 190. Seminar in Biochemistry.

The equivalent of one lecture hour a week for one semester. Biochemistry 190 and Chemistry 190 (Topic 3) may not both be counted. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in biochemistry.

### BCH 192G. Biochemistry Student Seminar.

Student presentations on current research topics. The equivalent of one lecture hour a week for one semester. Biochemistry 192G and Chemistry 192G may not both be counted. May be repeated for credit. Prerequisite: Graduate Standing in biochemistry.

### BCH 394. Structure and Function of Proteins and Nucleic Acids.

Explores the structures and functions of proteins and nucleic acids. Emphasis is placed on quantitative methods used to evaluate the roles of structural features in function and in developing new ways of thinking about the dynamics of macromolecules. Three lecture hours a week for one semester. Biochemistry 394 and Chemistry 394 may not both be counted. Prerequisite: Graduate standing.

### BCH 394P. Bioinformatics.

Subjects include physical methods for the study of macromolecules, chemistry of proteins, enzyme chemistry, regulatory mechanisms for gene expression, and protein-nucleic acid interactions. Three lecture hours a week for one semester. Biochemistry 394P and Chemistry 391L (Topic: Bioinformatics) may not both be counted. Prerequisite: Graduate standing.

### BCH 395G. Structure and Function of Proteins and Membranes.

Same as Biology 395G and Molecular Biology 395G. Detailed consideration of the structure and function of proteins, with discussion of enzyme mechanisms and kinetics, the biochemistry of energy production, and the metabolism of lipids and nucleotides. Three lecture hours a week for one semester. Only one of the following may be counted: Biochemistry 395G, Biology 395G, Chemistry 395G, Molecular Biology 395G. Prerequisite: Graduate standing; a one-year undergraduate sequence in biochemistry, such as Chemistry 339K and 339L, is strongly recommended.

### **BCH 395J. Genes, Genomes, and Gene Expression.**

Same as Biology 395J and Molecular Biology 395J. Detailed consideration of prokaryotic and eukaryotic mechanisms of DNA replication and transcription; posttranscriptional processing of transcription products; and mechanism and regulation of the translation of messenger RNAs. Three lecture hours a week for one semester. Only one of the following may be counted: Biochemistry 395J, Biology 395J, Chemistry 395J, Molecular Biology 395J. Prerequisite: Graduate standing; and Biology 395F and 395G, or Chemistry 395F and 395G, or Molecular Biology 395F and 395G, or consent of instructor.

### **BCH 396S. Synthetic Biology.**

Survey of current high-throughput technologies and computational methods for generating data and integrating information at all levels of biological organization. Emphasis on how hypotheses can be generated and tested with these techniques to better understand how model organisms function and evolve. Three lecture hours a week for one semester. Biochemistry 396S and Chemistry 391L (Topic: Synthetic Biology) may not both be counted. Prerequisite: Graduate standing.

### **BCH 197C, 297C, 397C, 497C, 597C, 697C. Advanced Study and Research in Biochemistry.**

For each semester hour of credit earned, the equivalent of one and a half laboratory hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of graduate adviser.

### **BCH 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in biochemistry and consent of the graduate adviser; for 698B, Biochemistry 698A.

### **BCH 398T. Professional Development for Graduate Students in Biochemistry.**

Restricted to graduate students in biochemistry. Provides professional development skills to graduate students in biochemistry. Subjects include excellence in teaching, scientific communication, grantsmanship, ethics, and career planning. Three lecture hours a week for one semester. Biochemistry 398T and Chemistry 398T may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in biochemistry.

### **BCH 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and registration for Chemistry 190 when it is given.

### **BCH 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Biochemistry 399R, 699R, or 999R; and registration for Chemistry 190 when it is given.

## **Chemistry: CH**

### **CH 380L. Inorganic Reactions and Structures.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **CH 380M. Advanced Study in Chemistry.**

For nonchemistry majors. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, a bachelor's degree with a major in science or mathematics, and consent of the graduate adviser in chemistry.

### **CH 380N. Advanced Inorganic Chemistry: Spectroscopy and Structure.**

Advanced inorganic chemistry, with emphasis on structure, spectroscopy, and ligand field theory. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **CH 080R. Dual MD/PhD Program with UT Medical Branch.**

Preclinical medical study at the University of Texas Medical Branch at Galveston. May not be taken concurrently with another course at the University of Texas at Austin. Prerequisite: Graduate standing and admission to the MD/PhD dual degree program in chemistry.

### **CH 380T. Current Concepts in Chemistry and Biochemistry: UTeach.**

Designed for beginning graduate students seeking a review of modern chemical concepts. Three lecture hours a week for one semester. May be repeated for credit with consent of instructor. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **CH 381M. Advanced Analytical Chemistry.**

Theory and application of special methods and recent advances. Three lecture hours a week for one semester. Prerequisite: Graduate standing in chemistry and consent of instructor.

### **CH 382J. Survey of Physical Chemistry.**

Surface chemistry and catalysis, transport properties, macromolecules, electrochemistry and electrolyte solutions, molecular thermodynamics, solution kinetics, and photochemistry. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **CH 382K. Advanced Physical Chemistry: Introduction to Quantum Mechanics.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Chemistry 354 or the equivalent.

### **CH 382L. Advanced Physical Chemistry: Statistical Mechanics.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **CH 382M. Advanced Physical Chemistry.**

Quantum chemistry. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Chemistry 354, 382K, or consent of instructor.

### **CH 182T, 282T, 382T, 682T. Advanced Study and Research: UTeach.**

Designed for beginning graduate students seeking review of modern chemical concepts. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **CH 386J. Advanced Organic Chemistry.**

Advanced organic chemistry, with emphasis on theory and reaction mechanisms. Three lecture hours a week for one semester. Prerequisite: Graduate standing, six semester hours of coursework in organic chemistry, and six semester hours of coursework in physical chemistry.

### **CH 386K. Advanced Organic Chemistry.**

Advanced organic chemistry, with emphasis on synthetic methods. Three lecture hours a week for one semester. Prerequisite: Graduate standing, six semester hours of coursework in organic chemistry, and six semester hours of coursework in physical chemistry.

### **CH 387K. Biochemical Techniques.**

Discussion of procedures and equipment used in modern biochemical investigation, with laboratory work to provide experience in techniques of general importance. Two lecture hours and seven laboratory hours a week for one semester. Prerequisite: Graduate standing, six semester hours of undergraduate coursework in biochemistry, and consent of instructor.

### **CH 190. Seminar in Chemistry.**

The equivalent of one class hour a week for one semester. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in chemistry.

**Topic 1: Analytical-Physical Chemistry.** Offered on the credit/no credit basis only.

**Topic 2: Organic Chemistry.** Offered on the credit/no credit basis only.

**Topic 4: Inorganic Chemistry.** Offered on the credit/no credit basis only.

### **CH 390K. Advanced Topics in Inorganic Chemistry.**

Topics include magnetic resonance; organometallic, main-group, and transition metal chemistry; nonaqueous solvents; high-temperature superconductors; new developments in synthetic chemistry; and aspects of inorganic chemistry relevant to material science. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in chemistry, Chemistry 380L, and consent of instructor.

### **CH 390L. Advanced Topics in Analytical Chemistry.**

Topics include electrochemistry, electronics, mathematical methods, mass spectrometry, and optical methods. For most topics, three lecture hours a week for one semester; for topics on electronics and optical methods, two lecture hours and three laboratory hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **CH 391. Advanced Topics in Organic Chemistry.**

Topics include organic photochemistry; molecular orbital theory; free radical chemistry; organometallic compounds; nuclear magnetic resonance and mass spectrometry; organic synthesis. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **CH 392H. Biomolecular Structure by Nuclear Magnetic Resonance Spectroscopy.**

Theory and application of modern nuclear magnetic resonance spectroscopy methods. Emphasis on applications to biological macromolecules, including protein and nucleic acid structure determination. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **CH 392J. Molecular Biology of the Yeast *Saccharomyces*.**

The use of yeast as a tool for the study of important areas of eukaryotic biology; the use of classical and molecular genetic techniques in the study of gene expression, DNA replication and repair, development and growth control, protein targeting, and metabolism. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Chemistry 329D or the equivalent or consent of instructor.

### **CH 392N. Physical Chemistry of Macromolecular Systems.**

Theory of macromolecular solutions and methods for characterization of macromolecular systems. Three lecture hours a week for one semester.

Prerequisite: Graduate standing, and undergraduate coursework in physical chemistry or consent of instructor.

### **CH 392T. Biotransformations of Drugs and Other Nonnutritive Compounds.**

Absorption and metabolism of naturally occurring and synthetic nonnutritive compounds. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Chemistry 394 or consent of instructor.

### **CH 392U. Comparative Biochemistry.**

Comparative aspects of protein structure, metabolism, respiration, and cellular regulation. Three lecture hours a week for one semester. Prerequisite: Graduate standing; and Chemistry 395G and 394, or consent of instructor.

### **CH 192W. Analytical Student Seminar.**

Student seminar presentations covering current research topics. Two lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **CH 393L. Advanced Topics in Physical Chemistry.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in chemistry and consent of instructor.

### **CH 395F. Genetics.**

Same as Biology 395F and Molecular Biology 395F. Basic principles of Mendelian and molecular genetics, and an exploration of the genetic toolbox using examples of analytic methods and modern genetic manipulations. Focus on the genetic analysis of model organisms. Use of genetic tools in dissecting complex biological pathways, developmental processes, and regulatory systems. Three lecture hours a week for one semester. Prerequisite: Graduate standing. An introductory course in genetics, such as Biology 325, is strongly recommended.

### **CH 395H. Cell Biology.**

Same as Biology 395H and Molecular Biology 395H. Detailed consideration of mechanisms of growth control, cell cycle regulation, mitosis, cell signaling, protein targeting, and the integration of these processes. Three lecture hours a week for one semester. Prerequisite: Graduate standing; and consent of instructor or Biology 395F and 395G, Chemistry 395F and 395G, Molecular Biology 395F and 395G.

### **CH 395K, 695K. Advanced Individual Study in Chemistry.**

Supervised reading or individual tutorial sessions on advanced topics in chemistry. For each semester hour of credit earned, one class hour a week for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing in chemistry and consent of the graduate adviser.

### **CH 197C, 297C, 397C, 597C, 697C. Problems in Chemistry.**

Conference course with laboratory work. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in chemistry and consent of instructor and the graduate adviser.

### **CH 197P, 297P, 397P, 597P, 697P. Problems in Chemistry.**

Conference course with laboratory. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in chemistry and consent of instructor.

### CH 397S. Advanced Topics in Chemistry.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### CH 698. Thesis.

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in chemistry and consent of the graduate adviser; for 698B, Chemistry 698A.

### CH 398T. Professional Development for Graduate Students in Chemistry.

Restricted to graduate students in chemistry. Provides professional development skills to graduate students in chemistry. Subjects include excellence in teaching, scientific communication, grantsmanship, ethics, and career planning. Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### CH 399R, 699R, 999R. Dissertation.

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### CH 399W, 699W, 999W. Dissertation.

Offered on the credit/no credit basis only. Prerequisite: Chemistry 399R, 699R, or 999R.

## Biological Sciences

*Master of Arts  
Doctor of Philosophy*

Graduate degrees in the biological sciences are offered by the School of Biological Sciences. The three degree programs—ecology, evolution, and behavior (p. 319); microbiology (p. 320); and plant biology (p. 320)—are described in each program section. Each program is administered by its own Graduate Studies Committee.

### Facilities for Graduate Work

The primary facilities for graduate instruction and research are provided in the Biological Laboratories building, the Louise and James Robert Moffett Molecular Biology Building, the Neural Molecular Science Building, the J. T. Patterson Laboratories Building, and at the Marine Science Institute at Port Aransas. Additional facilities include the Life Science Library, the Brackenridge Field Laboratory, the Stengl "Lost Pines" Biological Station, the Institute for Cellular and Molecular Biology, the Plant Resources Center, the Texas Memorial Museum, the Texas Natural Science Center, the Culture Collection of Algae, the Institute of Reproductive Biology, the Center for Computational Biology and Bioinformatics, the Institute for Neuroscience, the Environmental Science Institute, and the Animal Resources Center.

### Areas of Study

Graduate study supervised by the School of Biological Sciences is available in areas of specialization that cross the boundaries between the biological disciplines as classically defined. Among the broad areas of specialization are: behavioral biology, biological chemistry, biophysics, cellular and molecular biology, cytology and cytogenetics, developmental biology, ecology, population biology, evolution, host-parasite biology, human biology, immunobiology, genetics, molecular genetics, neurobiology, nutrition, paleontology, physiology, systematics,

and virology. Additional areas of specialization are listed in the sections for the three graduate programs.

## Ecology, Evolution, and Behavior

*Master of Arts  
Doctor of Philosophy*

### For More Information

**Campus address:** Norman Hackerman Building (NHB) 2.634, phone (512) 471-8490, fax (512) 232-3699; campus mail code: A6500

**Mailing address:** The University of Texas at Austin; Graduate Coordinator for Ecology, Evolution, and Behavior; School of Biological Sciences; 100 E 24th Street Stop A6500, Austin TX 78712-1598

**E-mail:** tamra@austin.utexas.edu

**URL:** <http://www.biosci.utexas.edu/graduate/eeb/>

### Areas of Study

The graduate program in ecology, evolution, and behavior encompasses a range of fields. Research ranges from the molecular level to the ecosystem, with approaches that include fieldwork, laboratory analyses, and mathematical modeling.

### Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Jeffrey E Barrick	Mathew A Leibold
Daniel I Bolnick	Donald A Levin
Deborah A Bolnick	Craig R Linder
James J Bull	Mikhail V Matz
David Cannatella	James D Mauseth
Zengjian J Chen	Lauren A Meyers
Julia A Clarke	Ian J Molineux
David P Crews	Nancy A Moran
Molly E Cummings	Ulrich G Mueller
Michael Daniels	Howard Ochman
Andrew Ellington	Jose L Panero
Norma L Fowler	Camille Parmesan
Lee A Fuiman	Steven M Phelps
Lawrence E Gilbert	Eric R Pianka
Robin Gutell	William H Press
Christine V Hawkes	Timothy B Rowe
Dean Hendrickson	Michael J Ryan
David M Hillis	Sahotra Sarkar
Johann Hofmann	Beryl B Simpson
Robert K Jansen	Michael C Singer
Shalene Jha	Edward C Theriot
Thomas E Juenger	Peter Thomas
Timothy H Keitt	Claus O Wilke
Mark A Kirkpatrick	Harold H Zakon

### Degree Requirements

#### Master of Arts

The graduate program is focused on the doctoral degree; this degree is designed for those who anticipate careers in research, possibly combined with teaching or other activities. Students seeking only the master's degree are rarely admitted. If a master's degree student is admitted, his or her proposed program must be approved by the Graduate Studies Committee. The Master of Arts degree consists of thirty hours

of coursework, including Biology 698 or 398R. The coursework must include a minor of six hours of coursework acceptable for graduate credit in another area of study.

## Doctor of Philosophy

For the Doctor of Philosophy, preliminary training should have provided a working core of knowledge in general biology and the history of biology; other helpful areas are plant biology, vertebrate and invertebrate zoology, genetics, ecology, evolution, animal behavior, and physiology. Statistics and computational skills are also valuable.

The student must take a two-semester core course in his or her first year in the program. Students take an additional three lecture courses. At least two of these must be taught by ecology, evolution, and behavior faculty. At least one must satisfy a requirement for quantitative skills. Students must also take Biology 384L, *Issues in Population Biology*, and a minimum of three additional courses that may include seminars or reading courses.

## Microbiology

*Master of Arts  
Doctor of Philosophy*

### For More Information

**Campus address:** Norman Hackerman Building (NHB) 2.632, phone (512) 471-4181, fax (512) 232-3699; campus mail code: A6500

**Mailing address:** The University of Texas at Austin, Graduate Coordinator for Microbiology, 100 East 24th Street A6500, Austin TX 78712

**E-mail:** [ygilmore@austin.utexas.edu](mailto:ygilmore@austin.utexas.edu)

**URL:** [www.icmb.utexas.edu/microbiology](http://www.icmb.utexas.edu/microbiology)

### Areas of Study

Microbiology offers a focused program of study encompassing disciplines in bacteriology, virology, immunology, genetics, and biochemistry, using both prokaryotic and eukaryotic model systems.

### Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Hal S Alper  
Jeffrey E Barrick  
R Malcolm Brown Jr  
Clarence Shiu Man Chan  
Lydia Maria Contreras  
Bryan William Davies  
Arturo De Lozanne  
Jaquelin P Dudley  
Lauren Ilyse Richie Ehrlich  
Andrew Ellington  
George Georgiou  
Vernita Gordon  
Rasika M Harshey  
David L Herrin  
Jon M Huibregtse  
Vishwanath R Iyer  
Makkuni Jayaram  
Arlen W Johnson  
Robert M Krug  
Alan Lambowitz

Andreas T Matouschek  
Richard J Meyer  
Kyle M Miller  
Ian J Molineux  
Nancy A Moran  
Theresa J O'Halloran  
Howard Ochman  
Tanya T Paull  
Shelley M Payne  
Bob G Sanders  
Sara L Sawyer  
Scott W Stevens  
Christopher S Sullivan  
Michael Stephen Trent  
Haley Tucker  
Jason Upton  
James R Walker  
Marvin Whiteley  
Blerta Xhemalce

## Degree Requirements

### Master of Arts

The microbiology graduate program does not accept applications for the master's degree. However, a student accepted into and in good standing with the doctoral program may, at the discretion of the graduate adviser, be permitted to pursue a master's degree in lieu of the PhD. The student must complete thirty-six semester hours of coursework, including Biology 395G, 395H, 395J, 395M, and 698, and three hours in related fields outside the microbiology program. He or she must earn a grade of at least *B-* in Biology 395G, 395H, 395J, and 395M. Each long-session semester, he or she must register for a weekly journal club that is offered by a member of the Graduate Studies Committee or approved by the graduate adviser. No more than nine semester hours of upper-division coursework may be counted toward the degree, and no more than six of these nine may be in any one field of study. In addition to the above requirements, a master's degree student must pursue original research under the direction of a faculty member and submit an approved thesis.

### Doctor of Philosophy

To be admitted to candidacy for the doctoral degree, the student must complete during the first three years a two-part preliminary examination. Part A, taken in the spring of the student's second year, consists of a presentation and defense of a mock National Institutes of Health grant proposal. Part B, taken within twelve months of Part A, consists of a presentation of a proposal for dissertation research. Individual programs of study are tailored to the student's interests, but each student must earn a grade of at least *B-* in the following coursework: Biology 395G, 395H, 395J, and 395M, and at least three additional hours in graduate lecture courses approved by the graduate adviser. He or she must attend a weekly journal club each long-session semester. The student must also pursue independent, original research under the direction of a faculty member; the results of this research constitute the dissertation, which fulfills the requirements of the required courses Biology 399R and 399W. Each student must serve as a teaching assistant for one long-session semester; two six-week summer terms are considered equivalent to a semester. A well-qualified student can usually complete the doctoral degree program in five to seven years.

## Plant Biology

*Master of Arts*



## For More Information

**Campus address:** Norman Hackerman Building (NHB) 2.634, phone (512) 471-8490, fax (512) 232-3699; campus mail code: A6500

**Mailing address:** The University of Texas at Austin, Graduate Coordinator for Plant Biology, School of Biological Sciences, 100 E 24th Street Stop A6500, Austin TX 78712

**E-mail:** tamra@austin.utexas.edu

**URL:** <http://www.biosci.utexas.edu/graduate/plantbio/>

## Areas of Study

Graduate study in plant biology is available in the following areas: algal physiology, plant biochemistry, cell biology, development, ecology, evolution, molecular biology, natural products chemistry, photobiology, phycology, plant anatomy, plant biogeography, plant morphology, plant physiology, population biology, systematics, and ultrastructure.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Jerry J Brand  
R Malcolm Brown Jr  
Karen S Browning  
Zengjian J Chen  
Norma L Fowler  
Lawrence E Gilbert  
Christine V Hawkes  
David L Herrin  
Enamul Huq  
Robert K Jansen  
Shalene Jha  
Thomas E Juenger  
John W La Claire II  
Mathew A Leibold

Donald A Levin  
Craig R Linder  
Alan M Lloyd  
James D Mauseth  
Mona Mehdy  
Nancy A Moran  
Jose L Panero  
Hong Qiao  
Stanley J Roux Jr  
Beryl B Simpson  
Sibum Sung  
Edward C Theriot  
Tracy A Villareal

## Admission Requirements

The undergraduate training of students planning to undertake graduate study in plant biology should ordinarily include at least twenty-four semester hours in plant biology and/or other biological sciences. At least twelve of these must be in upper-division work. This requirement in the major should be supported by coursework in the other sciences, especially chemistry, physics, and mathematics.

## Degree Requirements

### Master of Arts

At least thirty semester hours of coursework, including Biology 698 or 398R, are required. The coursework must include a minor of six hours of work acceptable for graduate credit in another area or areas. In general, at least one full year (including the summer) is needed to meet the requirements for the master's degree.

### Doctor of Philosophy

Mastery of an integrated and meaningful program of graduate study is deemed more important than the completion of a prescribed number of semester hours. Most programs include at least four graduate courses in

plant biology. Further supporting work in related sciences augments the program.

Admission to candidacy for the Doctor of Philosophy degree requires approval of the Graduate Studies Committee and is based on the total record of the student, performance in graduate courses, and such further examinations as the committee may require. An oral examination covering the major area of study is administered by the student's Qualifying Examination Committee no later than the end of the student's fourth long-session semester of residence.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

The abbreviations EEB, MIC, and PB in the following list identify the program(s) in the School of Biological Sciences with which the course is most closely associated. The abbreviation EEB represents ecology, evolution, and behavior; MIC, microbiology; and PB, plant biology.

## Related Courses

The following courses are described on the Marine Science (p. 342) page.

Marine Science 382, *Principles of Marine Science* (Topic 6: *Marine Ichthyology*). EEB.

Marine Science 384E, *Marine Microbial Ecology*. MIC.

## Biology: BIO

### BIO 380M. Topics in Biology (Cooperative Programs).

Formal, organized courses taught at institutions other than the University of Texas at Austin. Three lecture hours a week for one semester. Not all topics are offered every year. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, consent of the student's graduate adviser or department chair and the University's graduate dean, and consent of the graduate dean at the host institution; additional prerequisites vary with the topic.

### BIO 180R, 280R, 380R. Advanced Readings in the Biological Sciences.

For each semester hour of credit earned, the equivalent of one class hour a week for one semester. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### BIO 380T. Current Concepts in Biology.

Designed for beginning graduate students seeking a review of modern biological concepts. Three lecture hours a week for one semester. With consent of instructor, may be repeated for credit when the topics vary. Prerequisite: Graduate standing in the School of Biological Sciences, and consent of instructor and the graduate adviser.

### BIO 381K. Ecology, Evolution, and Behavior: Physiology and Biophysics.

Lectures, conference discussion, and laboratory projects, depending on topic. Not all topics are offered every year. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and consent of

instructor and the graduate adviser; additional prerequisites vary with the topic.

**Topic 1: Topics in Biophysics.** Irritability of living systems and the principles of energy transformation and transfer in organisms; emphasis on bioelectrical processes and electrical energy changes. Three lecture hours a week for one semester.

**Topic 2: Comparative Neurophysiology.** General treatment of the physiology of neurons, synapses, sensory and motor systems; neural basis of behavior; emphasis on invertebrates. Three lecture hours a week for one semester.

**Topic 3: Sensory Physiology.** Physiology and biophysics of the transduction and peripheral processes of the major sensory systems. Three lecture hours a week for one semester.

**Topic 4: Current Concepts in Neurobiology.** A series of seminars designed to give students a broad background in neurobiology. Three lecture hours a week for one semester.

**Topic 5: Laboratory in Neurophysiology.** Training in research techniques useful for the neurophysiological study of vertebrate and invertebrate nervous systems. Three lecture hours a week for one semester.

**Topic 6: Insect Physiology.** An in-depth study of the physiology of insect organ systems, development, and behavior. Three lecture hours a week for one semester.

**Topic 7: Developmental Neurobiology.** Neuronal cell lineage and differentiation, neuronal migration, axon guidance, neural cell death, synapse formation and maintenance. Three lecture hours a week for one semester.

**Topic 8: Addiction Biology.** Three lecture hours a week for one semester. Biology 381K (Topic 8) and Neuroscience 385L (Topic 3: Addiction Biology) may not both be counted.

**Topic 9: Comparative Animal Physiology.** Three lecture hours a week for one semester.

**Topic 11: Current Concepts in Neurophysiology.** Three lecture hours a week for one semester.

### **BIO 381N. Basic Processes of Nerve Cells.**

Same as Neuroscience 381N. Degeneration and regeneration in nervous systems following traumatic injury; invertebrate versus vertebrate, peripheral nervous system versus central nervous system, axonal versus cell body, role of glia versus neurons. Three lecture hours a week for one semester. Only one of the following may be counted: Biology 381K (Topic 10), 381N, Neuroscience 381N, 385L (Topic 1). Prerequisite: Graduate standing.

### **BIO 182, 282, 382, 682, 982. Advanced Study and Research.**

For each semester hour of credit earned, the equivalent of one class hour a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **BIO 382E. Epigenetics.**

Same as Neuroscience 382E. Study of how epigenetic modifications are covalent modifications of DNA or histones that cause changes in gene expression and how epigenetic modifications appear to be a method through which nurture or the environment can influence nature. Emphasis on how experience or environmental factors epigenetically modify health or behavior of animals. Three lecture hours a week for one semester. Only one of the following may be counted: Biology 381K (Topic: Epigenetics), 382E, Neuroscience 382E. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

### **BIO 383K. Ecology, Evolution, and Behavior: Development and Reproduction.**

Three lecture hours a week for one semester, or as required by the topic. Not all topics are offered every year. May be repeated for credit when the

topics vary. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **Topic 1: Hormonal Control of Development and Reproduction.**

Three lecture hours a week for one semester.

**Topic 2: Techniques in the Study of Development and Reproduction.** Eight laboratory hours a week for one semester.

**Topic 3: Comparative Endocrinology.** Structure, function, and interrelationships of endocrine glands, with emphasis on the control of hormone synthesis and secretion and mechanisms of hormone action. Three lecture hours a week for one semester.

**Topic 4: Recent Advances in Development and Reproduction.** Discussion of recent scientific papers and their contribution to modern work in development and reproduction. Three lecture hours a week for one semester.

**Topic 5: Molecular Analysis of Development.** Lectures and discussion concerning the principles of animal development at the molecular level. Three lecture hours a week for one semester.

**Topic 6: Current Literature in Cell and Developmental Biology.** Three lecture hours a week for one semester. Offered on the credit/no credit basis only.

**Topic 7: Seminar in Physiology and Behavior.** Three lecture hours a week for one semester.

**Topic 8: Development and Evolution.** Three lecture hours a week for one semester.

**Topic 9: Survey of Animal Development.** Three lecture hours a week for one semester. Offered on the credit/no credit basis only.

### **BIO 384C. Subjects and Skills in Ecology, Evolution, and Behavior I.**

Designed for first-year graduate students in ecology, evolution, and behavior. Study of why animals behave the ways they do. Study of the proximate and ultimate issues of animal behavior, how it is acquired and regulated, and how it evolved. Emphasis on integration of proximate and ultimate analyses in the various domains in which animals behave. First part of a two-semester sequence. Three lecture hours and one discussion hour a week for one semester. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 384D. Subjects and Skills in Ecology, Evolution, and Behavior II.**

Designed for first-year graduate students in ecology, evolution, and behavior. Continuation of the study of why animals behave the way they do. Continued overview of both the proximate and ultimate issues of animal behavior, how it is acquired and regulated, and how it evolved. Emphasis on integration of proximate and ultimate analyses in the various domains in which animals behave. Second part of a two-semester sequence. Three lecture hours and one discussion hour a week for one semester. Prerequisite: Graduate standing, Biology 384C, and consent of instructor and the graduate adviser.

### **BIO 384E. Population Ecology.**

Concepts, research methods, and current questions of population ecology. Both plant and animal examples are discussed. Three lecture hours a week for one semester. Prerequisite: Graduate standing, an upper-division undergraduate course in ecology, and consent of instructor and the graduate adviser.

### **BIO 384K. Ecology, Evolution, and Behavior.**

Basic concepts and methods of laboratory and field analysis in various fields of biology; systematics and ecology of natural populations. Lectures, conference discussions, and laboratory work, depending on topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser; additional prerequisites vary with the topic.

**Topic 2: Ornithology.** Behavior and ecology of birds, with emphasis on recent developments in the field. Three lecture hours a week for one semester.

**Topic 3: Herpetology.** Classification, speciation, morphological adaptations, mode of life, history, and ecology of amphibians and reptiles; emphasis on recent advances in the field. Three lecture hours a week for one semester.

**Topic 4: Ichthyology.** Evolution and ecology of fishes. Three lecture hours a week for one semester.

**Topic 5: Entomology.** Survey of original publications, research methods, and recent developments in the field, with emphasis on taxonomy, insecticides and repellants, and the role of insects in disease transmission. Three lecture hours a week for one semester.

**Topic 6: Invertebrate Zoology.** Study of the physiological ecology of animals, with emphasis on the invertebrates. Three lecture hours a week for one semester.

**Topic 7: Animal Behavior.** Causal basis, ontogeny, adaptive significance, and evolution of behavior patterns in animals. Three lecture hours a week for one semester.

**Topic 8: Environment and Evolution.** The role of environment in shaping populations and communities, with emphasis on terrestrial vertebrate animals and terrestrial communities. Three lecture hours a week for one semester.

**Topic 9: Community and Ecosystem Ecology.** Study of the ecological processes that produce and bring about change in the functional structure of communities: dispersal, colonization, population growth, competition. Three lecture hours a week for one semester.

**Topic 10: Ecological Studies in a Tropical-Temperate Transition.** Survey of the variety of habitats along a transect from southeastern Texas to southwestern Tamaulipas, from the standpoint of experimental field ecology. Three lecture hours a week for one semester.

**Topic 11: Ecological and Historical Biogeography.** Study of geographic assemblages of organisms, of ecological factors governing distributions, and of historical factors producing differences between ecologically similar regions. Three lecture hours a week for one semester.

**Topic 12: Mathematical Ecology.** An introduction to the mathematical methods and models used in current ecological theory. Three lecture hours a week for one semester.

**Topic 13: Aquatic Entomology.** A guide to the taxonomy of aquatic insects and to their use in biomonitoring. Two lecture hours and three laboratory hours a week for one semester. Only one of the following may be counted: Biology 321L, 370C (Topic: Applied Aquatic Entomology), 384K (Topic 13).

**Topic 14: Advanced Systematics.** Survey of systematic theory and methods, with emphasis on molecular phylogenetics and computational methods. Three lecture hours and three laboratory hours a week for one semester. Additional prerequisite: Biology 458L or the equivalent or consent of instructor.

**Topic 15: Insect-Plant Relationships.** Three lecture hours a week for one semester.

**Topic 16: Molecular Evolution.** Three lecture hours a week for one semester.

**Topic 17: Behavioral Ecology.** Advanced topics in behavioral ecology, considering the following in detail: animal communication, altruism, sexual selection, plant-animal interactions. Three lecture hours a week for one semester.

**Topic 19: Natural Resource Management.** Three lecture hours a week for one semester.

**Topic 20: Recent Advances in Computational Biology.** Discussion of current scientific papers, methods, and ideas in computational biology and bioinformatics. Three lecture hours a week for one semester.

**Topic 21: Recent Advances in Ecology and Systematics.**

Discussion of recent scientific papers and their contributions to modern work in systematic and environmental zoology. Three lecture hours a week for one semester.

**Topic 22: Advanced Topics in Microbial Ecology.** Discussion of current scientific ideas and controversies in microbial ecology, including community and ecosystem perspectives. Three lecture hours a week for one semester.

**Topic 23: Invasion Ecology.** Overview of the study of biological invasions by nonnative species. Three lecture hours a week for one semester.

**Topic 24: Coevolution.** Explores the reciprocal evolutionary interactions between species (mutualism, symbiosis, predator-prey, herbivore-host, pathogen-host interactions), within-species interactions (male-female or parent-offspring) as well as interactions between several coevolving partners. Three lecture hours and one discussion hour a week for one semester.

**Topic 25: Ecological and Evolutionary Genetics.** Introduction to quantitative genetic theory and approaches, with emphasis on experimental methods and analysis. Focuses on current subjects including natural selection, response to selection, genetic constraints, evolvability, local adaptation, linkage mapping, and quantitative trait locus and association mapping. Three lecture hours a week for one semester.

**Topic 26: Research Proposal Design and Writing.** Designed for students preparing grant proposals or postdoctoral grant applications. Students write proposals and submit them to a funding agency. Three lecture hours and one discussion hour per week for one semester.

**Topic 27: Python Programming for Biology.** Three lecture hours a week for one semester.

**Topic 28: The Comparative Method: Evolution, Ecology, and Phylogeny.** Three lecture hours a week for one semester.

#### **BIO 384L. Issues in Population Biology.**

Analysis at an advanced level of currently active areas of research in population biology. Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

#### **BIO 385C. Conservation Genetics.**

Genetic attributes of rare plant and animal species, especially as they affect conservation; germ plasm resource conservation in wild and domesticated species. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

#### **BIO 385K. Ecology, Evolution, and Behavior: Genetics.**

Training in the fields of genetics shown by the topics. Lectures, conference discussion, or lecture and laboratory, depending on topic. Not all topics are offered every year. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser; additional prerequisites vary with the topic.

**Topic 1: Developmental Genetics.** Discussion of biological processes controlling development, with particular attention to recent experimental investigations. Three lecture hours a week for one semester.

**Topic 2: Evolution.** Current problems and developments in evolution theory. Three lecture hours a week for one semester. Biology 370 and 385K (Topic 2) may not both be counted.

**Topic 3: Recent Advances in Population Genetics.** Discussion of recent scientific papers and their impact on theory and practice in population genetics. Three lecture hours a week for one semester.

**Topic 4: Population Genetics.** Dynamics and statistics of genetic populations. Three lecture hours a week for one semester.

**Topic 5: Research Design in Biology.** Formulation and criticism of research plans; the analysis and interpretation of biological observations. Three lecture hours a week for one semester.

**Topic 6: Genomics.** Genome structure, organization, and function of model organisms; theory and methodology of genetic and physical mapping; sequencing analysis and annotation; genome duplication and evolution; and ethics for biotechnology and cloning. Three lecture hours a week for one semester. Biology 384K (Topic: Genomics) and 385K (Topic 6) may not both be counted.

### **BIO 386. Topics in Plant Science: Ecology and Evolution.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser; additional prerequisites vary with the topic.

**Topic 1: Biogeography.**

**Topic 2: Methods of Systematics.**

**Topic 3: Philosophies of Systematics.**

**Topic 4: Plant Population Biology Seminar.**

**Topic 5: Plant Population Ecology Seminar.**

**Topic 6: Principles and Methods of Plant Monography.**

**Topic 7: Principles of Pollination Biology.**

**Topic 8: Global Environmental Change.** Global change as it affects terrestrial ecosystems, including feedbacks between ecosystems and the atmosphere. Topics include greenhouse gases and global warming, ozone, biological invasions, and land-use change.

**Topic 9: Synanthology.**

### **BIO 386P. Foundations of Plant Biology.**

Restricted to students in the plant biology graduate program. Study of foundational ideas across the breadth of plant biology. Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, and consent of the instructor and the graduate adviser.

### **BIO 387C. Plant Genetics.**

Genes, gene systems, linkage systems, and genetic systems in higher plants. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 387D. Biometry.**

An introduction to a variety of statistical techniques, including ANOVA, regression, and contingency table analysis. Students analyze their own data. Emphasis on biological applications. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 387E. Plant Speciation.**

Nature of species in higher plants, speciation phenomena in plants, natural hybridization, polyploidy, agamospermy, evolution of hybrid complexes. Three lecture hours a week for one semester. Biology 363 and 387E may not both be counted. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 287F. Plant Systematics.**

Principles of plant taxonomy, as exemplified by families of flowering plants found seasonally around Austin. Two lecture hours a week for one semester. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 487G. Taxonomic Plant Anatomy.**

An advanced course that emphasizes those aspects of plant anatomy that are most reliable and useful for systematic purposes. Three lecture hours and two laboratory hours a week for one semester. Biology 472L

and 487G may not both be counted. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 387J. Advanced Plant Anatomy.**

Plant anatomy in relation to development and differentiation, systematics, and evolution. Three lecture hours a week for one semester. Prerequisite: Graduate standing, consent of instructor and the graduate adviser, and concurrent enrollment in Biology 187L.

### **BIO 387K. Plant Evolution.**

The properties of plant populations, considered from genetic and ecological perspectives; mechanisms of evolution within and among populations. Three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 187L. Laboratory in Advanced Plant Anatomy.**

Demonstration of cellular details and tissue systems of plant organs, and instruction on the preparation of plant materials for histological examination. Three laboratory hours a week for one semester. Prerequisite: Graduate standing, consent of instructor and the graduate adviser, and concurrent enrollment in Biology 387J.

### **BIO 387M. Reproductive Biology of Flowering Plants.**

Pollination biology, breeding systems, and fruit and seed dispersal from evolutionary and ecological vantage points. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 387N. Plant Ecology.**

Advanced topics in plant ecology, including evaluation of ecological concepts, aspects of experimental ecology, and the principles of plant distribution. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 187P. Plant Ecology Laboratory.**

Demonstrations and experiments stressing plant ecological principles, including laboratory and field exercises. Three laboratory hours a week for one semester. Prerequisite: Graduate standing, consent of instructor and the graduate adviser, and credit or registration for Biology 387N.

### **BIO 387R. Population Ecology of Plants.**

A combination of lectures and student-led discussions covering major concepts and current literature in plant population ecology. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 387S. Laboratory Methods in Molecular Ecology and Systematics.**

An introduction to DNA methods in the study of molecular ecology, systematics, and evolution: DNA isolation and purification; DNA quantification; polymerase chain reaction; restriction fragment length polymorphism; random amplified polymorphic DNA; amplified fragment length polymorphism; cloning; simple sequence repeat (microsatellite) marker development; DNA sequencing; automated sequencing; automated genotyping; phylogenetic and population genetic analyses. Seven laboratory hours a week for one semester. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 287T. Angiosperm Diversity Laboratory.**

Practical experience in recognizing, identifying, and classifying families of flowering plants. Four laboratory hours a week for one semester. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 388C. Transmembrane Signaling Mechanisms.**

Mechanisms by which hormones, light, and other stimuli trigger changes in plant and animal cell metabolism. Three lecture hours a week for one semester. Biology 343M and 388C may not both be counted. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 388D. Research Topics in Plant Biology.**

An introduction to various fields of plant biology. Students attend seminars, faculty research presentations, and other meetings. Three lecture hours a week for one semester, with additional meeting times to be arranged. Prerequisite: Graduate standing in the School of Biological Sciences.

### **BIO 388E. Plant Growth and Development.**

Emphasis on whole plant physiology, especially growth and development, water relations, and mineral nutrition of vascular plants. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 388J. General Phycology.**

Survey of the algae, including significant biological aspects of selected genera, research techniques, and readings in the literature. Three lecture hours a week for one semester. Biology 327 and 388J may not both be counted. Prerequisite: Graduate standing, consent of instructor and the graduate adviser, and concurrent enrollment in Biology 188K.

### **BIO 188K. Laboratory in General Phycology.**

Survey of various algal groups, including direct observations of their biology, exposure to research techniques, and instruction in cultural procedures. Three laboratory hours a week for one semester. Prerequisite: Graduate standing, consent of instructor and the graduate adviser, and concurrent enrollment in Biology 388J.

### **BIO 388L. Laboratory Studies in Cell Biology: Plant Biology.**

Research exercises involving light microscopy, including polarization, phase contrast, Nomarski interference, dark field, fluorescence, and bright-field optics. High-resolution transmission electron microscopy. Hands-on experience with atomic and molecular imaging, including digital image processing and time-lapse video microscopy. One lecture hour and four laboratory hours a week for one semester. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 388M. Plant Molecular Biology.**

Fundamentals of plant molecular biology, including structure and expression of the chloroplast and mitochondrial genomes. Three lecture hours a week for one semester. Biology 350M and 388M may not both be counted. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 389. Topics in Plant Science: Cell and Development.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser; additional prerequisites vary with the topic.

**Topic 1: Advanced Studies in Light Microscopy.**

**Topic 2: Biology of the Blue-green Algae.**

**Topic 3: Cell Biology Seminar.**

**Topic 4: Genetic Engineering of Plants: Basic and Applied Aspects.** Strategies for isolation and characterization of genes; transfer of genes into plants; basic and applied uses of genetic engineering and the impact on agriculture and the environment.

**Topic 5: Medical Plant Chemistry.**

**Topic 6: Natural Products Chemistry.**

**Topic 7: Phycology Seminar.**

### **Topic 8: Plant Molecular Biology Seminar.**

### **Topic 9: Seminars in Phytochemistry.**

**Topic 11: Structure and Function of the Cell Nucleus.** Structure of the nuclear envelope and nuclear pores, the assembly and disassembly of the lamin layer, regulation, transport of RNA and protein into and out of the nuclei, RNA and DNA polymerases, topoisomerases, cyclin, aspects of cell nucleus activity.

**Topic 12: Advanced Plant Physiology.** General principles of mineral nutrition, water relations, metabolic activities, growth and development of green plants.

### **BIO 389C. Chemistry and Biology of Membranes.**

Consideration of the origin and structure of biological membranes at the microscopic and molecular levels; describes membrane function, especially with regard to transport properties. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Chemistry 339K or the equivalent, and consent of instructor and the graduate adviser.

### **BIO 389K. Advanced Cell Biology.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 390C. Fundamentals of Evolution.**

Introduction to major principles and questions in evolutionary biology. Subjects include population genetics, genetic diversity, adaptation, origin of species, phylogenetics, molecular evolution, and macroevolution. Emphasis on identifying open questions, analysis and interpretation of data, and gaining familiarity with the primary scientific literature. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 390D. Fundamentals of Integrative Animal Behavior.**

Introduction to major principles and questions in animal behavior with emphasis on why animals behave the way they do. Study of both the proximate and ultimate issues of animal behavior, how it is acquired and regulated, and how it evolved. Emphasis on integration of proximate and ultimate analyses in the various domains in which animals behave. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 390E. Fundamentals of Ecology.**

Introduction to major principles and questions in ecology. Subjects may include individual ecology, population dynamics, species interactions, mathematical models of ecological processes, community ecology, and ecosystem dynamics. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 890G. Applied Public Health and Medical Microbiology.**

One semester (or one summer session) of full-time training in the Texas Department of Health Laboratories, with rotation in the divisions of medical microbiology, mycology, parasitology, virology, sanitary bacteriology, and biologics. Assigned reading and regular meetings with the Department of Health Laboratories staff and the molecular genetics and microbiology faculty. Forty hours of supervised fieldwork a week for one semester. Prerequisite: Graduate standing, consent of instructor and the graduate adviser, and courses in immunology, public health bacteriology, and virology.

### **BIO 290K. Scanning Electron Microscopy, Theory and Practice.**

Theory of scanning electron microscopy and basic principles of instrument design; basic procedures in specimen preparation; hands-on experience.

Two lecture hours and six laboratory hours a week for six weeks. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 490M. Electron Microscopy I: Theory and Practice.**

An introduction to electron optics; emphasis on basic operation and maintenance of the transmission microscope; theory and practice of basic preparative techniques. Two lecture hours and six laboratory hours a week for one semester. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 390P. Techniques in Molecular Genetics.**

Laboratory training in modern molecular genetics, with emphasis on the manipulation of bacterial plasmid DNA as a model system. DNA purification, gene mapping and cloning, site-directed mutagenesis, polymerase chain reaction, and DNA sequencing. One lecture hour and seven laboratory hours a week for one semester. Biology 368L and 390P may not both be counted. Prerequisite: Graduate standing, consent of instructor and the graduate adviser, and Biology 366.

### **BIO 391. Grant Writing and Presentation Skills.**

Restricted to second-year graduate students in the microbiology and cell and microbiology programs. Preparation of a detailed proposal of the dissertation research goals of each student with a presentation in the form of a short talk. Emphasis on critical evaluation of research aims, methodology, and communication skills. Designed for second-year doctoral students in biology. Three lecture hours a week for one semester. Biology 391 and 394 (Topic: Grant Writing and Presentation Skills) may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser.

### **BIO 391K. Cellular Immunology.**

Cell-associated immune responses, with emphasis on transplantation, immunity, tumor immunology, delayed hypersensitivity, and acquired cellular resistance. Three lecture hours a week for one semester. Prerequisite: Graduate standing, consent of instructor and the graduate adviser, and Biology 360K and 160L.

### **BIO 391P. Advanced Virology.**

Replication of and transformation by DNA and RNA animal viruses. Three lecture hours a week for one semester. Prerequisite: Graduate standing, consent of instructor and the graduate adviser, and Biology 330.

### **BIO 391R. Advanced Metabolism and Biochemistry of Microorganisms.**

Study of the metabolic processes of microorganisms, using a biochemical approach. Three lecture hours a week for one semester. Biology 339 and 391R may not both be counted. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **BIO 391S. Microbial Genetics.**

Molecular biology of nucleic acids; biosynthesis of macromolecules, transfer of genetic material from cell to cell, recombination, mutagenesis, and regulatory mechanisms. Three lecture hours a week for one semester. Biology 366 and 391S may not both be counted. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **BIO 392. Problems in Host-Parasite Biology.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser; additional prerequisites vary with the topic.

**Topic 1: Current Topics in Virology and Immunology.**

**Topic 2: Current Topics in Pathogenic Mechanisms.**

### **BIO 392D. DNA Repair.**

Broad overview of the repair of DNA in archae, prokaryotes, eukaryotes, and viruses, focusing on the primary research literature, and developing critical thinking and presentation skills. Three lecture hours a week for one semester. Biology 392D and Biology 393 (Topic: DNA Repair) may not both be counted. Prerequisite: Graduate standing.

### **BIO 393. Problems in Molecular Genetics.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser; additional prerequisites vary with the topic.

**Topic 1: Current Topics in DNA Transactions.**

**Topic 2: Current Topics in Fungal and Cell Molecular Biology.**

**Topic 3: Current Topics in Gene Regulation.**

### **BIO 394. Problems in Microbial Physiology.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser; additional prerequisites vary with the topic.

**Topic 1: Current Topics in Cell Envelope Structure and Functions.**

**Topic 2: Current Topics in Microbial Signal Transduction.**

### **BIO 394M. Advanced Studies in Microbiology.**

In-depth study of microbiology topics. Students read original research papers in addition to text assignments. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, and consent of instructor and the graduate adviser; additional prerequisites vary with the topic.

**Topic 1: Advanced Immunology.** Studies in cell signaling in the immune system, transgenic and knockout gene analysis, T and B cell selection and maturation, and development of the immune system.

**Topic 2: Advanced Microbial Signal Transduction.** Studies in molecular and cellular biology of a wide variety of signal transduction systems in diverse microorganisms; the role of signal transduction across biological membranes in allowing cells to recognize and respond to their environment.

**Topic 3: Advanced Medical Mycology.** Studies in medical mycology and an overview of research involving both the fungal zoopathogen and its host.

**Topic 4: Advanced Fungal Cell and Molecular Biology.** Studies of the structure, function, and biological activities of fungi, with emphasis on recent advances in research.

### **BIO 395. Plant Biology: Laboratory Studies in Molecular Biology.**

Laboratory experience in modern molecular biology, including cloning using recombinant DNA methods, organelle isolation, purification of eukaryotic DNA and RNA, blot hybridization and transformation. One lecture hour and six laboratory hours a week for one semester. Prerequisite: Graduate standing; consent of instructor and the graduate adviser; and one of the following courses: Biology 320, 325, 328, 344, Chemistry 339L.

### **BIO 395F. Genetics.**

Same as Chemistry 395F and Molecular Biology 395F. Basic principles of Mendelian and molecular genetics, and an exploration of the genetic toolbox using examples of analytic methods and modern genetic manipulations. Focus on the genetic analysis of model organisms. Use of genetic tools in dissecting complex biological pathways, developmental processes, and regulatory systems. Three lecture hours a week for one

semester. Prerequisite: Graduate standing. An introductory course in genetics, such as Biology 325, is strongly recommended.

### **BIO 395G. Structure and Function of Proteins and Membranes.**

Same as Biochemistry 395G and Molecular Biology 395G. Detailed consideration of the structure and function of proteins, with discussion of enzyme mechanisms and kinetics, the biochemistry of energy production, and the metabolism of lipids and nucleotides. Three lecture hours a week for one semester. Only one of the following may be counted: Biochemistry 395G, Biology 395G, Chemistry 395G, Molecular Biology 395G. Prerequisite: Graduate standing; a one-year undergraduate sequence in biochemistry, such as Chemistry 339K and 339L, is strongly recommended.

### **BIO 395H. Cell Biology.**

Same as Chemistry 395H and Molecular Biology 395H. Detailed consideration of mechanisms of growth control, cell cycle regulation, mitosis, cell signaling, protein targeting, and the integration of these processes. Three lecture hours a week for one semester. Prerequisite: Graduate standing; and consent of instructor or Biology 395F and 395G, Chemistry 395F and 395G, Molecular Biology 395F and 395G.

### **BIO 395J. Genes, Genomes, and Gene Expression.**

Same as Biochemistry 395J and Molecular Biology 395J. Detailed consideration of prokaryotic and eukaryotic mechanisms of DNA replication and transcription; posttranscriptional processing of transcription products; and mechanism and regulation of the translation of messenger RNAs. Three lecture hours a week for one semester. Only one of the following may be counted: Biochemistry 395J, Biology 395J, Chemistry 395J, Molecular Biology 395J. Prerequisite: Graduate standing; and Biology 395F and 395G, or Chemistry 395F and 395G, or Molecular Biology 395F and 395G, or consent of instructor.

### **BIO 395M. Advanced Microbiology.**

Restricted to microbiology students. Prokaryotic and lower eukaryote genome organization; control of gene/operon/regulon expression; chromosome replication and its control; signal transduction; protein trafficking; organelle assembly; the cell cycle and its control; developmental processes; cell to cell communication; and DNA polymorphisms and adaptation. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **BIO 396. Membranes and Walls of Bacteria.**

Structure, biosynthesis, and function of bacterial envelopes and walls, including associated optional components. Three lecture hours a week for one semester. Prerequisite: Graduate standing, consent of instructor and the graduate adviser, and a course in general microbiology and a course in general biochemistry.

### **BIO 396R. Microbiology Research Seminar.**

Students present their research findings and receive feedback from faculty and peers. Designed to help students refine their presentation techniques, practice giving critical feedback, and gain familiarity with a wide variety of research topics. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **BIO 197. Seminar in Microbiology.**

One lecture hour a week for one semester. Required of all molecular genetics and microbiology majors. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **BIO 397J. Advanced Genetics.**

Intended mainly for first- and second-year graduate students. Selected related topics of current interest with an emphasis on molecular developmental genetics, and any needed review of classical genetics. Designed to help the student to read the literature critically, deliver a good seminar, and participate in thoughtful discussion. Three lecture hours a week for one semester. May not be counted toward the doctoral degree in microbiology. Prerequisite: Graduate standing, consent of instructor and the graduate adviser, and a course in genetics.

### **BIO 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. For 698A, graduate standing in the School of Biological Sciences and consent of the graduate adviser; for 698B, Biology 698A or the equivalent.

### **BIO 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in the School of Biological Sciences and consent of the graduate adviser.

### **BIO 398T. Supervised Teaching in Biological Sciences.**

Teaching under the close supervision of course instructors; weekly group meetings with the instructor, individual consultations, and reports throughout the teaching period. The equivalent of three lecture hours a week for one semester. Prerequisite: Graduate standing and appointment as a teaching assistant.

### **BIO 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **BIO 399W, 699W, 999W. Dissertation.**

May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Biology 399R, 699R, 999R, or the equivalent.

## **Cell and Molecular Biology**

*Master of Arts  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Louise and James Robert Moffett Molecular Biology Building (MBB) 1.220F, phone (512) 471-0957, fax (512) 471-2149; campus mail code: A4810

**Mailing address:** The University of Texas at Austin, Graduate Program in Cell and Molecular Biology, 1 University Station A4810, Austin TX 78712

**E-mail:** cmbprogram@austin.utexas.edu

**URL:** <http://www.icmb.utexas.edu/cmb/>

### **Facilities for Graduate Work**

**Core research facilities.** The Institute for Cellular and Molecular Biology (ICMB) core facilities support cellular and molecular biology research at the University of Texas at Austin. The facilities offer a full range of services in nucleic acid and protein sequencing, microscopy, peptide synthesis, mass spectrometry, protein purifications and analysis, DNA microarrays, next-generation sequencing, X-ray crystallography, and transgenic knock-out mice. The core facilities are open to all faculty, regardless of whether or not they are ICMB members. Keeping the core

facilities as comprehensive and accessible as possible increases faculty, staff, and student research productivity.

**DNA and Genomics Facility.** The DNA and Genomics Facility provides DNA sequencing, fragment analysis, quantitative real-time PCR, NanoDrop spectrophotometer, phosphor and fluor imaging, a plate reader, and automated liquid handling. Automated DNA sequencing is performed using capillary-based Applied Biosystems 3730 and 3130 DNA analyzers. These instruments offer high throughput and sensitivity with a capability of handling more than 800 samples per day, with reads greater than 700 base pairs and a success rate of over 90 percent. The AB 3730 and 3730XL are also used for the analysis of microsattelites, AFLP, SNPs, and other fragment applications. Quantitative real-time PCR is run on an Applied Biosystems 7900HT. This instrument allows researchers to analyze gene expression using allelic discrimination and SNP analysis in 96 or 384 wells. The quantification of DNA, RNA, and proteins using only one or two microliters without a cuvette is performed on the NanoDrop spectrophotometer. The Typhoon Trio and Bio-Rad Molecular Imager FX measure and image radioactive signals from gels or membranes and fluorescence from gels, membranes, TLC plates, and microtiter plates. Other instruments include an Agilent bioanalyzer, Beckman Biomek NX and FX pipetting robots, and a Beckman plate washer. A Berthold NightOWL is available for low-light imaging of luminescence or fluorescence in plants or animals. More information about the facility's services is available on the DNA and Genomics Facility Web site (<http://www.icmb.utexas.edu/core/DNA>).

**Microscopy and Imaging Facility.** The Microscopy and Imaging Facility provides extensive microscopy equipment and services for imaging and ultrastructural analysis. The facility offers assisted use and training on its instrumentation and consults on microscopy- and spectroscopy-related research. Equipment in the facility includes: scanning and transmission electron microscopes; super-resolution, confocal, and wide-field fluorescence microscopes; cryostat, plastic, and paraffin microtomes; an ultramicrotome; a laser microdissection system; and several stereology systems. The facility also provides state-of-the-art image processing and analysis software. The Microscopy and Imaging Facility also manages the Flow Cytometry Laboratory, which houses several fluorescence-based cell analyzers and a cell sorter. More information about the facility's services is available on the Microscopy and Imaging Facility Web site (<https://icmb.utexas.edu/microscopy-and-imaging-facility>).

**Proteomics and Metabolomics Facility.** The Proteomics and Metabolomics Facility provides a variety of biomolecular analyses using sophisticated mass spectrometry instrumentation, as well as related protein support services. It is administered collectively by ICMB, the College of Pharmacy, and the University of Texas M. D. Anderson Cancer Center Science Park. Bioplex instrumentation brings on board multiplex assays using antibody bead technology, providing sensitive quantification of cytokines and hormones. A MALDI-TOF/TOF mass spectrometer with a nano LC spotting robot is used for identification and quantification of proteins. Protein modification studies are conducted in collaboration with researchers using enrichment and mass spectrometry techniques. An LCQ provides protein/peptide molecular weight determination. Quantitative analyses of metabolites, drugs, nutrients, and natural products are performed on AB Sciex 4000 QTRAP, GC-MS, and HPLC-EC instruments. Sensitive detection is possible for a variety of metabolites including 8-oxo-dG, neurotransmitters, prostaglandins, and fatty acids. N-terminal protein/peptide sequencing, peptide synthesis, in-gel digest, and gel electrophoresis services are also available. The facility houses self-service HPLC, mass spectrometry, and analytical centrifugation systems. Researchers can utilize these instruments after a training session with the facility staff. More information about the facility's services is available on the Protein and Metabolite Analysis Facility Web site (<http://www.utexas.edu/pharmacy/divisions/pharmtox/core>).

**Mouse Genetic Engineering Facility.** The Mouse Genetic Engineering Facility is located in the Animal Resource Center and provides many services to the University research community. The primary service is the production of genetically altered mice. This includes: (1) the generation of transgenic mice (pronuclear injections); (2) gene targeting in mouse embryonic stem cells by homologous recombination (electroporation and selection); and (3) the subsequent generation of knock-out/knock-in mice (blastocyst injections). Other services include embryo cryopreservation; long-term storage and recovery of frozen embryos; conversion of mouse strains to a pathogen-free status; isolation of new embryonic stem cell lines from specific existing mouse strains; and assistance with timed-mating experiments for developmental studies. Our staff has expertise in obtaining blood samples from mice, as well as administering tail vein injections. The facility also maintains a specific pathogen-free barrier for the housing and husbandry of mice. More information about the facility's services is available on the Mouse Genetic Engineering Facility Web site (<http://www.icmb.utexas.edu/facilities/mouse>).

**Genomic Sequencing and Analysis Facility.** The Genomic Sequencing and Analysis Facility provides advanced analytical resources for analysis of DNA and RNA at whole-genome scales and extends these resources through ongoing research and development. These resources include DNA microarray and next-generation DNA sequencing equipment (Life Technologies 5500xl SOLiD, Illumina HiSeq 2000, and Roche 454 sequencers), Agilent bioanalyzer, NanoDrop, Biomek robotic liquid handling, and arrayer capabilities. More information about the facility's services is available on the Genomic Sequencing and Analysis Facility Web site (<https://wikis.utexas.edu/display/GSAF/Home+Page>).

**Macromolecular Crystallography Facility.** The Macromolecular Crystallography Facility allows users to solve the three-dimensional structures of crystallized macromolecules using X-ray diffraction methods. Dozens of high-resolution protein structures have been solved using these facilities. The capacities of the center were recently expanded into a modern core facility. Current equipment includes two X-ray generators and three state-of-the-art detection systems. The Rigaku MicroMax 007HF generator has two detectors, one mounted with VariMax HighRes optics and the other with VariMax HighFlux optics. The HighRes optics facilitate data collection on crystal unit cells up to 300 Å in size, and the HighFlux optics provide some of the strongest radiation outside of synchrotron sources. Cryo-cooling for all three detectors also bolsters the collection of high-resolution data. The facility also contains an Art Robbins Instruments Phoenix liquid-handling robot. It uses extremely small volumes, down to 50 nl, and is ideal for high-throughput crystallization experiments. The new crystallography facility is staffed to carry out structural analysis on a service basis, or to train and assist interested users in both crystallization and collection, processing, and interpretation of X-ray data. More information about the facility's services is available on the Macromolecular Crystallography Facility Web site (<http://www.icmb.utexas.edu/core/xray>).

## Areas of Study

The Institute for Cellular and Molecular Biology provides the support and infrastructure for the largest life science graduate program at the University of Texas at Austin. The interdisciplinary graduate program in cell and molecular biology is supported by more than 130 faculty members from three colleges and over ten academic departments.

The program offers students training in seven different research tracks: bioinformatics and computational biology, biomolecular structure and function, cell and developmental biology, chemical biology and drug discovery, molecular genetics, neurobiology, and plant molecular biology. Each of the tracks provides specialized courses and training



for the graduate student beyond the basic core curriculum of genetics, biochemistry, molecular biology, and cell biology.

## **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Seema Agarwala  
Richard W Aldrich  
Hal S Alper  
Eric V Anslyn  
Dean R Appling  
Nigel S Atkinson  
Chandrajit L Bajaj  
Aaron Blair Baker  
Jeffrey E Barrick  
Adela Ben-Yakar  
George D Bittner  
Amy Brock  
R Malcolm Brown Jr  
Karen S Browning  
James J Bull  
Zengjian J Chen  
Lydia Maria Contreras  
David P Crews  
Maria A Croyle  
Kevin N Dalby  
Bryan William Davies  
Arturo De Lozanne  
John Digiovanni  
Michael Drew  
Jaquelin P Dudley  
Johann K Eberhart  
Lauren Ilyse Richie Ehrlich  
Ron Elber  
Andrew Ellington  
Walter L Fast  
Ilya J Finkelstein  
Richard H Finnell  
Janice Ann Fischer  
Ernst-Ludwig Florin  
George Georgiou  
Nace L Golding  
Vernita Gordon  
Andrea C Gore  
Jeffrey M Gross  
Robin Gutell  
Marvin L Hackert  
R A Harris  
Rasika M Harshey  
Christine V Hawkes  
David M Hillis  
David W Hoffman  
Johann Hofmann  
Jon M Huibregtse  
Enamul Huq  
Brent L Iverson  
Vishwanath R Iyer  
Robert K Jansen  
Makkuni Jayaram  
Ning Jiang  
Arlen W Johnson  
Kenneth Johnson  
Christopher A Jolly  
Thomas E Juenger  
Adrian T Keatinge-Clay  
Sean M Kerwin  
Jonghwan Kim  
Robert M Krug  
Alan Lambowitz  
Seongmin Lee  
Hung-Wen Liu

Paul M Macdonald  
Dmitrii E Makarov  
Edward M Marcotte  
Mia K Markey  
Stephen F Martin  
Andreas T Matouschek  
Mikhail V Matz  
Jennifer A Maynard  
Mona Mehdy  
Robert Messing  
Richard J Meyer  
Lauren A Meyers  
S J Mihic  
Kyle M Miller  
Edward M Mills  
Daniel P Miranker  
Ian J Molineux  
Nancy A Moran  
Hitoshi Morikawa  
Richard A Morrisett  
Somshuvra Mukhopadhyay  
Hiroshi Nishiyama  
Theresa J O'Halloran  
Howard Ochman  
Tanya T Paull  
Shelley M Payne  
Steven M Phelps  
Jonathan T Pierce-Shimomura  
Martin Poenie  
William H Press  
Nicholas J Priebe  
Hong Qiao  
Kimberly Raab-Graham  
Pengyu Ren  
John H Richburg  
Jon D Robertus  
Stanley J Roux Jr  
Rick Russell  
Bob G Sanders  
Sara L Sawyer  
Jason B Shear  
Jeanne Casstevens Stachowiak  
David S Stein  
Scott W Stevens  
Laura J Suggs  
Christopher S Sullivan  
Sibum Sung  
Stefano Tiziani  
Michael Stephen Trent  
Haley Tucker  
Jason Upton  
Carla L Vandenberg  
Karen Marie Vasquez  
Steven A Vokes  
James R Walker  
John B Wallingford  
Lauren J Webb  
Marvin Whiteley  
Christian P Whitman  
Claus O Wilke  
Casey W Wright  
Blerta Xhemalce  
Harold H Zakon  
Boris Zemelman  
Xiaojing Zhang

Alan M Lloyd

Yan Zhang

## Admission Requirements

Applicants must provide evidence of strong accomplishment in the natural sciences, documented by undergraduate grades and a bachelor's degree or the equivalent in an area such as one of the biological sciences, chemistry, or physics. Preparation should include at least one semester each of cell biology and molecular biology, and one year each of calculus, organic chemistry, and general physics. Coursework in genetics and biochemistry is also required. Deficiencies in undergraduate work should be corrected before application to the program.

Because the graduate program is focused on the doctoral degree, students seeking only the master's degree are not admitted.

## Degree Requirements

**Master of Arts.** The master's degree is only granted under special circumstances. The student must have the approval of the graduate adviser.

**Doctor of Philosophy.** The doctoral degree program requires the student to accomplish creative, independent research and to document the research in a scholarly dissertation. In preparation, the student must acquire a strong foundation in biochemistry, molecular genetics, and cell biology, and a working knowledge of the area of biology in which he or she intends to conduct research. This preparation is provided by the core courses and electives required for the master's degree. The student must earn a grade of at least *B-* in each core course. To be admitted to candidacy for the degree, the student must formulate a feasible research program and pass a qualifying examination.

## Dual Degree Program

### Doctor of Philosophy/Doctor of Medicine

The graduate program in cell and molecular biology participates in a dual degree program with the University of Texas Medical Branch at Galveston (UTMB). Applicants must apply separately to and be admitted to both the PhD program in cell and molecular biology at the University of Texas at Austin and the medical school at UTMB; this program is not accepting new applications. Students accepted into the dual degree program spend their first two years in the medical school at UTMB, followed by three to four years of doctoral work at UT Austin and eighteen months of clinical rotations. The degrees are conferred separately by each institution. Additional information may be found at the MD-PhD dual degree program Web site (<http://www.mdphd.utexas.edu>).

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Molecular Biology: MOL

#### MOL 380. Advanced Readings in Molecular Biology.

Individual instruction in the literature of molecular biology. Individual instruction. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **MOL 080M. Dual MD/PhD Program with UT Medical Branch.**

Preclinical medical study at the University of Texas Medical Branch at Galveston. May not be taken concurrently with another course at the University of Texas at Austin. Prerequisite: Graduate standing and admission to the MD/PhD dual degree program in cell and molecular biology.

### **MOL 190C, 290C, 390C. Seminar in Molecular Biology.**

Lectures and discussions on current topics in molecular biology. One, two, or three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Seminar in Molecular Biology I.** Students read, present, and discuss current research papers based on speakers for the Institute for Cellular and Molecular Biology weekly seminar series. Students also will present short talks on their the research from one of their laboratory rotations.

**Topic 2: Seminar in Molecular Biology II.** Students write a mock grant proposal with their principle investigator and present a practice part one preliminary exam talk based on the proposal.

**Topic 3: Seminar in Molecular Biology III.** Students present a detailed seminar on their thesis research.

### **MOL 192, 292, 392, 492, 592, 692, 792, 892, 992. Research Problems.**

One lecture hour a week for one semester, with additional laboratory hours. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### **MOL 195. Molecular Biology Conference Course.**

Conference course. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **MOL 395F. Genetics.**

Same as Biology 395F and Chemistry 395F. Basic principles of Mendelian and molecular genetics, and an exploration of the genetic toolbox using examples of analytic methods and modern manipulations. Focus on the genetic analysis of model organisms. Use of genetic tools in dissecting complex biological pathways, developmental processes, and regulatory systems. Three lecture hours a week for one semester. Prerequisite: Graduate standing. An introductory course in genetics, such as Biology 325, is strongly recommended.

### **MOL 395G. Structure and Function of Proteins and Membranes.**

Same as Biochemistry 395G and Biology 395G. Detailed consideration of the structure and function of proteins, with discussion of enzyme mechanisms and kinetics, the biochemistry of energy production, and the metabolism of lipids and nucleotides. Three lecture hours a week for one semester. Only one of the following may be counted: Biochemistry 395G, Biology 395G, Chemistry 395G, Molecular Biology 395G. Prerequisite: Graduate standing; a one-year undergraduate sequence in biochemistry, such as Chemistry 339K and 339L, is strongly recommended.

### **MOL 395H. Cell Biology.**

Same as Biology 395H and Chemistry 395H. Detailed consideration of mechanisms of growth control, cell regulation, mitosis, cell signaling, protein targeting, and the integration of these processes in various cellular processes. Three lecture hours a week for one semester. Prerequisite: Graduate standing; and consent of instructor or Biology 395F and 395G, Chemistry 395F and 395G, Molecular Biology 395F and 395G.

### **MOL 395J. Genes, Genomes, and Gene Expression.**

Same as Biochemistry 395J and Biology 395J. Detailed consideration of prokaryotic and eukaryotic mechanisms of DNA replication and transcription; posttranscriptional processing of transcription products; and mechanism and regulation of the translation of messenger RNAs. Three lecture hours a week for one semester. Only one of the following may be counted: Biochemistry 395J, Biology 395J, Chemistry 395J, Molecular Biology 395J. Prerequisite: Graduate standing; and Biology 395F and 395G, or Chemistry 395F and 395G, or Molecular Biology 395F and 395G, or consent of instructor.

### **MOL 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in molecular biology and consent of the graduate adviser; for 698B, Molecular Biology 698A.

### **MOL 398T. Supervised Teaching in Molecular Biology.**

Teaching under close supervision of the instructor; weekly laboratory instruction of undergraduates, group meetings with the instructor, individual consultations, and reports throughout the teaching period. Three lecture hours a week for one semester. Prerequisite: Graduate standing in molecular biology.

### **MOL 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **MOL 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Molecular Biology 399R, 699R, or 999R.

## **Chemistry**

*Master of Arts  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Robert A. Welch Hall (WEL) 2.218, phone (512) 471-4538, fax (512) 471-6835; campus mail code: A5300

**Mailing address:** The University of Texas at Austin, Graduate Program in Chemistry, Department of Chemistry, 105 East 24th Street A5300, Austin TX 78712-0165

**E-mail:** bhamblen@cm.utexas.edu

**URL:** <http://www.cm.utexas.edu/>

### **Facilities for Graduate Work**

The Mallet Chemistry Library is the largest academic chemistry library in the country. In addition to extensive print collections in all areas of chemistry and chemical engineering, the library provides access to major database resources such as SciFinder (Chemical Abstracts), Reaxys, Web of Science, and DIPPR Thermodynamic Data, as well as hundreds of electronic scholarly journals and thousands of e-books. These resources are available through the University Libraries Web site (<http://www.lib.utexas.edu>).

The Department of Chemistry maintains suitably equipped and well-staffed shops for glassblowing, machine work, and electronics maintenance and design. There are service laboratories equipped for organic analysis and for work in spectrophotometry; spectropolarimetry; photoelectron, nuclear magnetic, and electron spin resonance; X-ray diffraction; and mass spectrometry. Other specialized equipment is

available in various laboratories. The facilities of Information Technology Services are used in numerous research programs.

## Areas of Study

Graduate study in chemistry is offered in the areas of chemical physics, analytical, inorganic, organic, or physical chemistry. Each of these broad areas encompasses specialized aspects of the subject. Details are available from the chair of the department's Graduate Admissions Committee.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Eric V Anslyn	Michael J Krische
Allen J Bard	David A Laude
Jennifer S Brodbelt	Hung-Wen Liu
Alan Campion	Dmitrii E Makarov
James R Chelikowsky	Stephen F Martin
Alan H Cowley	Charles B Mullins
Richard M Crooks	Emily Que
Ananth Dodabalapur	Sean Thomas Roberts
Guangbin Dong	Michael Rose
Ron Elber	Peter J Rossky
Andrew Ellington	Jonathan L Sessler
Christopher J Ellison	Jason B Shear
John B Goodenough	Dionicio R Siegel
Graeme A Henkelman	Greg O Sitz
Bradley J Holliday	John F Stanton
Simon M Humphrey	Keith J Stevenson
Brent L Iverson	David A Vandembout
Richard A Jones	Lauren J Webb
Adrian T Keatinge-Clay	Katherine A Willets
Sean M Kerwin	Carlton G Willson

## Admission Requirements

The preliminary training of students seeking a graduate degree in chemistry must include at least twenty-four semester hours of undergraduate work in chemistry, consisting of twelve or more semester hours of upper-division coursework and at least two courses (including laboratory) in organic chemistry and two in physical chemistry; one in analytical chemistry; and one in inorganic chemistry.

## Degree Requirements

One semester of Chemistry 398T is required of all candidates for advanced degrees.

## Master of Arts

Master's degree students must complete thirty semester hours of coursework, including a minor of at least six semester hours. No more than nine hours of upper-division work may be counted; these hours must be divided between the major and the minor. Candidates normally must also submit a thesis based on individual research. The thesis course may be counted as six of the thirty semester hours required for the degree. In general, two and one-half years are necessary to finish the Master of Arts. A Master of Arts degree with report is not offered, nor is a non-thesis Master of Arts.

## Doctor of Philosophy

Doctoral degree students who plan to specialize in analytical, inorganic, organic, or physical chemistry must complete six courses on the letter-

grade basis. The qualifying examinations are usually completed within the first twenty months in residence or before application for candidacy. The student is examined by members of the Graduate Studies Committee in his or her areas of concentration before admission to candidacy. Four to five years of full-time study are usually required to complete the Doctor of Philosophy degree program.

## Dual Degree Program

### Doctor of Philosophy/Doctor of Medicine

The graduate program in chemistry participates in a dual degree program with the University of Texas Medical Branch at Galveston (UTMB). Applicants must apply separately to and be admitted to both the PhD program in chemistry at the University of Texas at Austin and the medical school at UTMB; this program is not accepting new applications. Students accepted into the dual degree program spend their first two years in the medical school at UTMB, followed by at least three to four years of doctoral work at UT Austin and eighteen months of clinical rotations. The degrees are conferred separately by each institution. Additional information may be found at the MD-PhD dual degree program Web site (<http://www.mdphd.utexas.edu>).

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Chemistry: CH

#### CH 380L. Inorganic Reactions and Structures.

Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### CH 380M. Advanced Study in Chemistry.

For nonchemistry majors. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, a bachelor's degree with a major in science or mathematics, and consent of the graduate adviser in chemistry.

#### CH 380N. Advanced Inorganic Chemistry: Spectroscopy and Structure.

Advanced inorganic chemistry, with emphasis on structure, spectroscopy, and ligand field theory. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### CH 080R. Dual MD/PhD Program with UT Medical Branch.

Preclinical medical study at the University of Texas Medical Branch at Galveston. May not be taken concurrently with another course at the University of Texas at Austin. Prerequisite: Graduate standing and admission to the MD/PhD dual degree program in chemistry.

#### CH 380T. Current Concepts in Chemistry and Biochemistry: UTeach.

Designed for beginning graduate students seeking a review of modern chemical concepts. Three lecture hours a week for one semester. May be repeated for credit with consent of instructor. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

**CH 381M. Advanced Analytical Chemistry.**

Theory and application of special methods and recent advances. Three lecture hours a week for one semester. Prerequisite: Graduate standing in chemistry and consent of instructor.

**CH 382J. Survey of Physical Chemistry.**

Surface chemistry and catalysis, transport properties, macromolecules, electrochemistry and electrolyte solutions, molecular thermodynamics, solution kinetics, and photochemistry. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

**CH 382K. Advanced Physical Chemistry: Introduction to Quantum Mechanics.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Chemistry 354 or the equivalent.

**CH 382L. Advanced Physical Chemistry: Statistical Mechanics.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

**CH 382M. Advanced Physical Chemistry.**

Quantum chemistry. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Chemistry 354, 382K, or consent of instructor.

**CH 182T, 282T, 382T, 682T. Advanced Study and Research: UTeach.**

Designed for beginning graduate students seeking review of modern chemical concepts. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

**CH 386J. Advanced Organic Chemistry.**

Advanced organic chemistry, with emphasis on theory and reaction mechanisms. Three lecture hours a week for one semester. Prerequisite: Graduate standing, six semester hours of coursework in organic chemistry, and six semester hours of coursework in physical chemistry.

**CH 386K. Advanced Organic Chemistry.**

Advanced organic chemistry, with emphasis on synthetic methods. Three lecture hours a week for one semester. Prerequisite: Graduate standing, six semester hours of coursework in organic chemistry, and six semester hours of coursework in physical chemistry.

**CH 387K. Biochemical Techniques.**

Discussion of procedures and equipment used in modern biochemical investigation, with laboratory work to provide experience in techniques of general importance. Two lecture hours and seven laboratory hours a week for one semester. Prerequisite: Graduate standing, six semester hours of undergraduate coursework in biochemistry, and consent of instructor.

**CH 190. Seminar in Chemistry.**

The equivalent of one class hour a week for one semester. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in chemistry.

**Topic 1: Analytical-Physical Chemistry.** Offered on the credit/no credit basis only.

**Topic 2: Organic Chemistry.** Offered on the credit/no credit basis only.

**Topic 4: Inorganic Chemistry.** Offered on the credit/no credit basis only.

**CH 390K. Advanced Topics in Inorganic Chemistry.**

Topics include magnetic resonance; organometallic, main-group, and transition metal chemistry; nonaqueous solvents; high-temperature superconductors; new developments in synthetic chemistry; and aspects of inorganic chemistry relevant to material science. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in chemistry, Chemistry 380L, and consent of instructor.

**CH 390L. Advanced Topics in Analytical Chemistry.**

Topics include electrochemistry, electronics, mathematical methods, mass spectrometry, and optical methods. For most topics, three lecture hours a week for one semester; for topics on electronics and optical methods, two lecture hours and three laboratory hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**CH 391. Advanced Topics in Organic Chemistry.**

Topics include organic photochemistry; molecular orbital theory; free radical chemistry; organometallic compounds; nuclear magnetic resonance and mass spectrometry; organic synthesis. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**CH 392H. Biomolecular Structure by Nuclear Magnetic Resonance Spectroscopy.**

Theory and application of modern nuclear magnetic resonance spectroscopy methods. Emphasis on applications to biological macromolecules, including protein and nucleic acid structure determination. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

**CH 392J. Molecular Biology of the Yeast *Saccharomyces*.**

The use of yeast as a tool for the study of important areas of eukaryotic biology; the use of classical and molecular genetic techniques in the study of gene expression, DNA replication and repair, development and growth control, protein targeting, and metabolism. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Chemistry 329D or the equivalent or consent of instructor.

**CH 392N. Physical Chemistry of Macromolecular Systems.**

Theory of macromolecular solutions and methods for characterization of macromolecular systems. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and undergraduate coursework in physical chemistry or consent of instructor.

**CH 392T. Biotransformations of Drugs and Other Nonnutritive Compounds.**

Absorption and metabolism of naturally occurring and synthetic nonnutritive compounds. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Chemistry 394 or consent of instructor.

**CH 392U. Comparative Biochemistry.**

Comparative aspects of protein structure, metabolism, respiration, and cellular regulation. Three lecture hours a week for one semester. Prerequisite: Graduate standing; and Chemistry 395G and 394, or consent of instructor.

### **CH 192W. Analytical Student Seminar.**

Student seminar presentations covering current research topics. Two lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **CH 393L. Advanced Topics in Physical Chemistry.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in chemistry and consent of instructor.

### **CH 395F. Genetics.**

Same as Biology 395F and Molecular Biology 395F. Basic principles of Mendelian and molecular genetics, and an exploration of the genetic toolbox using examples of analytic methods and modern genetic manipulations. Focus on the genetic analysis of model organisms. Use of genetic tools in dissecting complex biological pathways, developmental processes, and regulatory systems. Three lecture hours a week for one semester. Prerequisite: Graduate standing. An introductory course in genetics, such as Biology 325, is strongly recommended.

### **CH 395H. Cell Biology.**

Same as Biology 395H and Molecular Biology 395H. Detailed consideration of mechanisms of growth control, cell cycle regulation, mitosis, cell signaling, protein targeting, and the integration of these processes. Three lecture hours a week for one semester. Prerequisite: Graduate standing; and consent of instructor or Biology 395F and 395G, Chemistry 395F and 395G, Molecular Biology 395F and 395G.

### **CH 395K, 695K. Advanced Individual Study in Chemistry.**

Supervised reading or individual tutorial sessions on advanced topics in chemistry. For each semester hour of credit earned, one class hour a week for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing in chemistry and consent of the graduate adviser.

### **CH 197C, 297C, 397C, 597C, 697C. Problems in Chemistry.**

Conference course with laboratory work. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in chemistry and consent of instructor and the graduate adviser.

### **CH 197P, 297P, 397P, 597P, 697P. Problems in Chemistry.**

Conference course with laboratory. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in chemistry and consent of instructor.

### **CH 397S. Advanced Topics in Chemistry.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **CH 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in chemistry and consent of the graduate adviser; for 698B, Chemistry 698A.

### **CH 398T. Professional Development for Graduate Students in Chemistry.**

Restricted to graduate students in chemistry. Provides professional development skills to graduate students in chemistry. Subjects include excellence in teaching, scientific communication, grantsmanship, ethics, and career planning. Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **CH 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **CH 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Chemistry 399R, 699R, or 999R.

## **Computer Science**

*Master of Science in Computer Science  
Doctor of Philosophy*

### **For More Information**

Campus address: Department of Computer Science

Gates Dell Complex (GDC)

The University of Texas at Austin

2317 Speedway, Stop D9500, Austin, TX 78712

Phone: 512.471.7316 Fax: 512.471.8885

**E-mail:** csadmis@cs.utexas.edu

**URL:** <http://www.cs.utexas.edu/>

### **Facilities for Graduate Work**

To provide the most advanced resources for teaching and research, the Department of Computer Science manages its own network and system of more than 1,000 hosts.

A staff of thirteen, under the direction of the department's associate chair for operations, specifies, buys, installs, and maintains this computing infrastructure. Through accounts on the department's UNIX, Windows, and Macintosh workstations, students, faculty members, and staff have access to public laboratories and private equipment.

Many different computer systems are available for research use by faculty members and students in the department. The department operates a general-purpose high-throughput computing (HTC) Linux cluster with over 2,000 cores, Dell PowerEdge checkpoint servers, ten GeForce GTX Titan Black GPUs, and a NetApp FAS3050C storage server with twenty-four terabytes. This cluster, as well as all public computing resources, are available to everyone via Condor, a resource management tool for widely distributed systems. There are several hundred Linux machines in public labs, and there are over 100 linux boxes on graduate desks. Several hundred other workstations of varying configurations and platforms are located in private research labs or on researchers' desks.

All departmental computers are networked together using one or ten Gigabits per second Ethernet. The network, managed and maintained by staff, consists of over 100 Cisco switches, with a Cisco 6513 serving as its point of presence and firewall. Network servers include the research-dedicated NetApp FAS3050 with twenty-six terabytes of storage and a NetApp FAS3270 with fifty terabytes of RAIDed disk that is used for home directory service, as well as many other file servers, print servers, and communications servers.

### **Areas of Study**

Graduate study in computer science is offered in the following areas: analysis of algorithms and programs; artificial intelligence; automated reasoning; communication protocols; compilers; computational biology; computational complexity; computational visualization; computer

architecture; computer graphics; computer networks; cryptography; data mining; database management; distributed systems; fault-tolerant computing; formal methods; machine learning; mathematical software; mobile and ad hoc networks; natural language processing; neural networks; numerical analysis; operating systems; parallel programming; programming language design and implementation; randomized computation; real-time systems; robotics; scientific computing; secure computing; software construction from components; system modeling; theoretical computer science; and wireless networks.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

J K Aggarwal	Vladimir Lifschitz
Lorenzo Alvisi	Calvin Lin
Chandrajit L Bajaj	Risto P Miikkulainen
Jason M Baldridge	Daniel P Miranker
Dana H Ballard	Jayadev Misra
Don S Batory	Aloysius K Mok
Alan C Bovik	Raymond J Mooney
Alan K Cline	Gordon S Novak Jr
William R Cook	Zhigang Pan
Inderjit S Dhillon	Dewayne E Perry
Isil Dillig	Keshav K Pingali
Thomas W Dillig	C Greg Plaxton
Ron Elber	Bruce W Porter
E Allen Emerson	William H Press
Katrin E Erk	Eric Price
Donald S Fussell	Lili Qiu
Anna Gal	Vijaya Ramachandran
Vijay K Garg	Pradeep Ravikumar
Joydeep Ghosh	Vitaly Shmatikov
Mohamed G Gouda	Peter H Stone
Kristen L Grauman	Robert A Van De Geijn
Warren A Hunt Jr	Paul E Vouga
Lizy K John	Brent R Waters
Miryung Kim	Andrew B Whinston
Adam R Klivans	Emmett Witchel
Simon S Lam	David I Zuckerman

## Admission Requirements

Most entering graduate students have degrees in computer science. Students with degrees in other areas may be considered for admission; if admitted, they may be required to take undergraduate courses in computer science, without credit toward a graduate degree, to satisfy background requirements.

## Degree Requirements

### Five-Year Integrated Bachelor's and Master's Program

The Department of Computer Science offers an integrated program to enable **the currently enrolled** highly motivated undergraduate students with strong intellectual capacities to earn a Bachelor of Science in Computer Science and a Master of Science in Computer Science within a five-year period. The integrated program is designed to prepare students for competitive doctoral programs and provide strong leadership skills and technical depth to students entering professional positions.

## Master of Science

The Department of Computer Science offers two options for the master's program. The thesis option requires thirty semester hours of coursework, which includes six hours in the thesis course. The option without thesis requires thirty semester hours of coursework.

## Doctor of Philosophy

The Doctor of Philosophy is a research degree for students who wish to pursue research careers in academia or industry. The main goal of the doctoral program is to prepare students to do outstanding research. Doctoral students take courses that provide the foundation on which to build their research programs, and are expected to become involved in research during their first semester and continue their involvement throughout their study at the University.

Students should complete all course requirements within a three-year period and maintain a grade point average of at least 3.00 in all computer science graduate courses. After application to candidacy, students must complete at least **two semesters** in residence.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Computer Science: C S

#### C S 380C. Compilers.

Basics of static analysis and transformation techniques; exploration in depth of one aspect of compilation and optimization. Three lecture hours a week for one semester. Computer Science 380C and 395T (Topic: Compilers) may not both be counted. Prerequisite: Graduate standing; Computer Science 357 and 375 are recommended.

#### C S 380D. Distributed Computing I.

Models of distributed systems; language issues, proving properties of distributed systems; time, clocks, partial ordering of events; deadlock and termination detection; diffusing computations; computing in hostile environments; distributed resource management. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Computer Science 372.

#### C S 380J. Operating Systems Implementation.

Seminar about how operating systems work. Readings and discussion about classic and recent research papers. Intensive programming assignments in the construction of a prototype operating system. Three lecture hours a week for one semester. Computer Science 380J and 395T (Topic: Operating Systems Implementation) may not both be counted. Prerequisite: Graduate standing; and an undergraduate course in operating systems, networking, or distributed systems, or consent of instructor.

#### C S 380L. Advanced Operating Systems.

Study of the formal structure, design principles, organization, implementation, and performance analysis of multiprogramming and/or multiprocessor computer systems. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Computer Science 372 or consent of instructor.

### **C S 380N. Systems Modeling.**

Theory and applications of Markovian models: birth-death models, queueing models, and networks of queues. Numerical methods: computational algorithms, approximation techniques, discrete-event simulation. Performance of scheduling disciplines: priority, time-sharing, multiple access. Three lecture hours a week for one semester. Prerequisite: Graduate standing and an undergraduate course in probability theory.

### **C S 380P. Parallel Systems.**

Explores parallel systems, from languages to hardware, from large-scale parallel computers to multicore chips, and from traditional parallel scientific computing to modern uses of parallelism. Includes discussion of and research methods in graphics, languages, compilers, architecture, and scientific computing. Three lecture hours a week for one semester. Computer Science 380P and 395T (Topic: Parallel Systems) may not both be counted. Prerequisite: Graduate standing.

### **C S 380S. Theory and Practice of Secure Systems.**

Survey of modern security, designed to introduce the basic techniques used in the design and analysis of secure systems. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Computer Science 353 and 372 or consent of instructor.

### **C S 381K. Artificial Intelligence.**

Use of computers in problem solving, game playing, theorem proving, natural language understanding, and related tasks; methods of search, knowledge representation, learning, and other topics. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Computer Science 351 or consent of instructor.

### **C S 381V. Visual Recognition.**

Subjects include fundamental representations, learning approaches, matching-based algorithms, human activity models for video, and large-scale recognition. Three lecture hours a week for one semester. Computer Science 381V and 395T (Topic: Visual Recognition) may not both be counted. Prerequisite: Graduate standing; a background in basic computer vision and machine learning is recommended.

### **C S 382M. Advanced Computer Architecture.**

Algorithms and their realizations, special techniques for coding, addressing, and control; integration of computer units; relations between programming and design considerations. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **C S 383C. Numerical Analysis: Linear Algebra.**

Same as Computational Science, Engineering, and Mathematics 383C, Mathematics 383E, and Statistics and Data Sciences 393C. Survey of numerical methods in linear algebra: floating-point computation, solution of linear equations, least squares problems, algebraic eigenvalue problems. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 383C, Computational Science, Engineering, and Mathematics 383C, Computer Science 383C, Mathematics 383E, Statistics and Data Sciences 393C, Statistics and Scientific Computation 393C. Prerequisite: Graduate standing; Computer Science 367 or Mathematics 368K; and Mathematics 340L, 341, or consent of instructor.

### **C S 383D. Numerical Analysis: Interpolation, Approximation, Quadrature, and Differential Equations.**

Same as Computational Science, Engineering, and Mathematics 383D, Mathematics 383F, and Statistics and Data Sciences 393D. Survey of numerical methods for interpolation, functional approximation, integration, and solution of differential equations. Three lecture hours a week for one semester. Only one of the following may be counted: Computational

and Applied Mathematics 383D, Computational Science, Engineering, and Mathematics 383D, Computer Science 383D, Mathematics 383F, Statistics and Data Sciences 393D, Statistics and Scientific Computation 393D. Prerequisite: Graduate standing; Computational Science, Engineering, and Mathematics 383C (or Computational and Applied Mathematics 383C), Computer Science 383C, Mathematics 383E, or Statistics and Data Sciences 393C (or Statistics and Scientific Computation 393C); and Mathematics 427K and 365C, or consent of instructor.

### **C S 384G. Computer Graphics.**

Same as Computational Science, Engineering, and Mathematics 382G. Advanced material in computer graphics, including in-depth treatments of techniques for realistic image synthesis, advanced geometric modeling methods, animation and dynamic simulation, scientific visualization, and high-performance graphics architectures. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 384G, Computational Science, Engineering, and Mathematics 382G, Computer Science 384G. Prerequisite: Graduate standing; and Computer Science 354 or another introductory course in computer graphics, or equivalent background and consent of instructor.

### **C S 384M. Multimedia Systems.**

Theoretical and practical issues in advanced systems, including multimedia systems, digital audio and video compression techniques, operating system and network support for digital audio and video, and multimedia conferencing systems. Three lecture hours a week for one semester. Prerequisite: Graduate standing; and either Computer Science 356 and 372 or 380D and 380L.

### **C S 384R. Geometric Modeling and Visualization.**

Computational image processing, computational geometry and geometric modeling algorithms with an emphasis on spatial realism, and the programmatic use of physiological simulation and visualization to quantitatively depict how things work at the molecular, cellular, tissue, organ, and system levels. Three lecture hours a week for one semester. Computer Science 384R and 395T (Topic: Graphics, Modeling, and Visualization) may not both be counted; Computer Science 384R and 395T (Topic: Multiscale Bio-Modeling and Visualization) may not both be counted; Computer Science 384R and 395T (Topic: Physically Based Geometric Modeling) may not both be counted. Prerequisite: Graduate standing, and Computer Science 354 or consent of instructor.

### **C S 384V. Introduction to VLSI Design.**

Basic techniques required to design custom negative metal oxide semiconductor digital integrated circuits. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Computer Science 352 or consent of instructor.

### **C S 386C. Dependable Computing Systems.**

System models from synchronous to asynchronous, with emphasis on in-between models such as the timed asynchronous model. Control structures such as timed state-transition systems, and constraints in temporal and real-time logics. Analysis techniques such as model checking of timed systems, and extended Presburger arithmetic. Basic building blocks such as clock synchronization, synchronous atomic broadcast, time-bounded membership protocols, real-time scheduling theory, and state recovery methods. Practical implementation issues such as special operating system data structures and algorithms, open system design, and security concerns. Three lecture hours a week for one semester. Computer Science 386C and 395T (Topic: Dependable Computing Systems) may not both be counted. Prerequisite: Graduate standing, and an undergraduate course in operating systems or consent of instructor.



**C S 386D. Database Systems.**

Introduction to the principles of database systems, including fundamental ideas and algorithms used in the construction of centralized database management systems, distributed database management systems, and database machines and their roles in Internet infrastructure. Topics include data storage and indexing algorithms, query processing and optimization, concurrency control, recovery, XML and object-oriented databases, database evaluation and tuning, and recent directions in database research. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Computer Science 347 and 375.

**C S 386K. Numerical Treatment of Differential Equations.**

The analysis of numerical methods for solving ordinary and partial differential equations. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 386K, Computer Science 386K, Mathematics 383G. Prerequisite: Graduate standing; and Computational and Applied Mathematics 383D, Computer Science 383D, Mathematics 368K, 383F, or consent of instructor.

**C S 386L. Programming Languages.**

Topics include formal syntax representations, program correctness, typing, and data abstraction. Features and problems in languages that allow parallelism. Exploration of different programming styles, such as imperative, functional, logic, data flow, and object-oriented programming. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Computer Science 345 or consent of instructor.

**C S 386M. Communication Networks.**

Switching techniques, network and protocol architectures, communication protocols, resource allocation problems, internetworking, design and analysis methods. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**C S 386S. Network Protocol Security.**

Techniques and research in Internet and network security. Three lecture hours a week for one semester. Computer Science 386S and 395T (Topic: Secure Network Protocols) may not both be counted. Prerequisite: Graduate standing.

**C S 386W. Wireless Networking.**

Fundamental concepts and principles of wireless network technologies and protocol design, ranging from physical layer to application layer, and in-depth studies of current wireless research. Three lecture hours a week for one semester. Computer Science 386W and 395T (Topic: Wireless Networking) may not both be counted. Prerequisite: Graduate standing.

**C S 388. Natural Language Processing.**

Computational methods for syntactic and semantic analysis of structures representing meanings of natural language; study of current natural language processing systems; methods for computing outlines and discourse structures of descriptive text. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and a course in artificial intelligence or consent of instructor.

**C S 388C. Combinatorics and Graph Theory.**

Counting, matching theory, extremal set theory, Ramsey theory, probabilistic method, linear algebra method, coding theory. Applications to computer science, including randomized algorithms. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Computer Science 336 or the equivalent or consent of instructor. An understanding of elementary proof and counting techniques is assumed.

**C S 388F. Automata and Formal Languages.**

Formal grammars, languages and related classes of automata, language hierarchies, operations on languages, decidability, related complexity issues, closure properties, other classes of automata. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Linguistics 340 or consent of instructor.

**C S 388G. Algorithms: Techniques and Theory.**

Sorting and searching algorithms, graph algorithms, algorithm design techniques, lower bound theory, fast Fourier transforms, NP-completeness. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Computer Science 357 or the equivalent or consent of instructor.

**C S 388H. Cryptography.**

Surveys the foundations of cryptography from formal notions of security to fundamental protocols, including one-way functions, encryption, pseudorandom generators, signature schemes, and zero-knowledge. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Computer Science 353 or consent of instructor.

**C S 388L. Introduction to Mathematical Logic.**

Introduction to some of the principal topics of mathematical logic: propositional and predicate calculus; Goedel's completeness theorem; first-order theories; formalizing mathematical reasoning; first-order arithmetic; recursive functions; Goedel's incompleteness theorems; axiomatic set theory. Three lecture hours a week for one semester. Prerequisite: Graduate standing and experience in abstract mathematical thinking.

**C S 388M. Communication Complexity.**

Covers the most important models of communication complexity and their applications, including recent research results and various open problems. Three lecture hours a week for one semester. Computer Science 388M and 395T (Topic: Communication Complexity) may not both be counted. Prerequisite: Graduate standing.

**C S 388P. Parallel Algorithms.**

Parallel algorithm design on shared memory machines (PRAMs); parallel complexity results; lower bounds; relationship of PRAM model to other models of parallel computation. Three lecture hours a week for one semester. Prerequisite: Graduate standing; and Computer Science 357 or the equivalent, or Computer Science 388G, or consent of instructor.

**C S 388R. Randomized Algorithms.**

The design and analysis of efficient randomized algorithms. Three lecture hours a week for one semester. Computer Science 388R and 395T (Topic: Randomized Algorithms) may not both be counted. Prerequisite: Graduate standing, and Computer Science 357 or consent of instructor.

**C S 388S. Formal Semantics and Verification.**

Sequential execution: partial and total correctness; deductive, operational, and denotational semantics; formal derivation of programs; parallel execution: partial correctness, deadlock, and starvation; methodology, parallel versus distributed execution. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

**C S 388T. Theory of Computation.**

Models of computation, decidability, complexity theory, relations between complexity classes, reductions, and completeness; NP-complete problems, randomized computation; approximability; circuit complexity; parallel computation. Three lecture hours a week for one semester. Prerequisite: Graduate standing; and Computer Science 353 or 357 or consent of instructor.

### **C S 389L. Automated Logical Reasoning.**

Subjects include automated reasoning techniques for propositional logic, first-order logic, linear arithmetic over reals and integers, theory of uninterpreted functions, and combinations of these theories. Examines automated logical reasoning both from a theoretical and practical perspective, giving a hands-on experience building useful tools, such as SAT and SMT solvers. Three lecture hours a week for one semester. Computer Science 389L and 395T (Topic: Automated Logical Reasoning) may not both be counted. Prerequisite: Graduate standing.

### **C S 389M. Principles of Object-Oriented Software Technology.**

Fundamental principles of object-oriented software engineering, including design and implementation of object-oriented analysis methods, software architectures, translators of high-level programming language representations, translations to multiple-software architectures. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Computer Science 371S or the equivalent, and consent of instructor.

### **C S 389R. Recursion and Induction I.**

The development of a formal theory for reasoning about computer programs, with emphasis on recursively defined functions in the LISP style and proof by mathematical induction. Heavy emphasis on student discovery and presentation of proofs. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **C S 390D. Distributed Computing II.**

Synchronous and asynchronous algorithms, with particular emphasis on notations for expressing the algorithms and logics for reasoning about them. Algorithms from a variety of application areas and for a variety of architectures. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Computer Science 380D.

### **C S 391D. Data Mining: A Mathematical Perspective.**

Mathematical and statistical aspects of data mining. Topics include supervised learning (regression, classification, support vector machines) and unsupervised learning (clustering, principal components analysis, dimensionality reduction). Uses technical tools that draw from linear algebra, multivariate statistics, and optimization. Three lecture hours a week for one semester. Computer Science 391D and 395T (Topic: Data Mining: A Statistical Learning Perspective) may not both be counted. Prerequisite: Graduate standing, and Mathematics 341 or the equivalent.

### **C S 391K. Artificial Intelligence II.**

Advanced course in artificial intelligence. Topics include planning, probabilistic reasoning, truth maintenance, abduction, model-based diagnosis, and speech recognition. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Computer Science 381K or equivalent knowledge of artificial intelligence and LISP.

### **C S 391L. Machine Learning.**

Computing systems that automatically improve their performance with experience, including various approaches to inductive classification such as version space, decision tree, rule-based, neural network, Bayesian, and instance-based methods; as well as computational learning theory, explanation-based learning, and knowledge refinement. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Computer Science 381K or equivalent knowledge of artificial intelligence and LISP.

### **C S 392C. Methods and Techniques for Parallel Programming.**

Models of parallel fundamental concepts for representation of parallel computation structures, study of representative parallel programming languages, formulation of languages and translation methods, translation

of parallel programs to multiple targets, laboratory exercises in parallel programming. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **C S 392F. Automated Software Design.**

Model driven engineering; metamodels, UML diagrams, constraints, transformations, software product lines, feature models, feature modularity, category theory, functors, commuting diagrams, program algebras, feature interactions, multi-dimensional separation of concerns, design-by-transformation, parallel software architectures, correct-by-construction, architecture refinement, optimization, and extension, program refactorings, design patterns, refactoring scripts. Three lecture hours a week for one semester. Computer Science 392F and 395T (Topic: Feature-Oriented Programming) may not both be counted. Prerequisite: Graduate standing, and a basic knowledge of Java, compilers and grammars, and object-oriented design methods.

### **C S 393C. Agent-Based Electronic Commerce.**

Focuses on the intersection of computer science (including multiagent systems and machine learning), economics, and game theory. Explores economic mechanisms of exchange suitable for use by automated intelligent agents, including auctions and auction theory, game theory and mechanism design, and autonomous bidding agents. Students demonstrate programming proficiency in a trading agent competition. Three lecture hours a week for one semester. Computer Science 393C and 395T (Topic: Agent-Based Electronic Commerce) may not both be counted. Prerequisite: Graduate standing.

### **C S 393D. Topics in Numerical Analysis.**

Recent topics have included numerical methods in ordinary differential equations, numerical methods in partial differential equations, computational problems in linear algebra, numerical solution of systems of equations, numerical methods in functional approximation, numerical integration. Three lecture hours a week for one semester. Some sections are offered on the credit/no credit basis only; these are identified in the Course Schedule. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **C S 393N. Numerical Solution of Elliptic Partial Differential Equations.**

Same as Mathematics 393N. The numerical solution of large systems of linear algebraic equations arising in the solution of elliptic partial differential equations by discretization methods. Three lecture hours a week for one semester. Computational and Applied Mathematics 393M and Computer Science 393N may not both be counted. Prerequisite: Graduate standing; and Computational Science, Engineering, and Mathematics 383K (or Computational and Applied Mathematics 386K), Computer Science 386K, Mathematics 387C (or 383G), or consent of instructor.

### **C S 393R. Autonomous Robots.**

Covers the steps necessary to create and program fully functional teams of autonomous robots, including locomotion, object manipulation, vision (segmentation and object detection), localization, inter-robot communication, Kalman filters and control theory, individual behavior creation, and multiagent coordination and strategic reasoning. Three lecture hours a week for one semester. Computer Science 393R and 395T (Topic: Autonomous Robots) may not both be counted. Prerequisite: Graduate standing.

### **C S 394C. Algorithms for Computational Biology.**

Algorithm design in computational molecular biology, with a focus on multiple sequence alignment and phylogeny (evolutionary history) reconstruction. Topics include the design and analysis of algorithms under probabilistic models of evolution, heuristics, and exact solutions for NP-

hard optimization problems. Three lecture hours a week for one semester. Computer Science 394C and 395T (Topic: Algorithms for Computational Biology) may not both be counted. Prerequisite: Graduate standing, and Computer Science 357 or the equivalent.

#### **C S 394F. Knowledge Representation and Reasoning.**

Surveys the research and practice of building knowledge systems, including knowledge representation, automated reasoning, knowledge acquisition, and explanation generation. Three lecture hours a week for one semester. Prerequisite: Graduate standing; and Computer Science 381K or the equivalent or consent of instructor.

#### **C S 394N. Neural Networks.**

Biological information processing; architectures and algorithms for supervised learning, self-organization, reinforcement learning, and neuro-evolution; theoretical analysis; hardware implementations and simulators; applications in engineering, artificial intelligence, and cognitive science. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### **C S 394P. Automatic Programming.**

Automatic generation of computer programs from high-level specifications. Program analysis, optimization, and transformation; partial evaluation; object-oriented programming; transformation of formal specifications; specialization of generic procedures; views. Three lecture hours a week for one semester. Prerequisite: Graduate standing. Computer Science 375 and 381K are recommended.

#### **C S 394R. Reinforcement Learning: Theory and Practice.**

Introduces the theory and practice of modern reinforcement learning, with emphasis on temporal difference learning algorithms. Three lecture hours a week for one semester. Computer Science 394R and 395T (Topic: Reinforcement Learning: Theory and Practice) may not both be counted. Prerequisite: Graduate standing.

#### **C S 195, 295, 395. Conference Course.**

Conference course. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

#### **C S 195T, 395T. Topics in Computer Science.**

From eight to fifteen topics are offered each semester. One or three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**Topic 1: Parallel Computations.** Computer Science X95T (Topic 1) is same as Computational and Applied Mathematics 195T, 295T, 395T. Computational and Applied Mathematics 395T (Topic 1: Parallel Computations) and Computer Science 395T (Topic 1) may not both be counted.

#### **C S 396. Research Practice and Experience.**

Open only to those in their first two years as graduate students in computer science. Designed to provide an early research experience for new doctoral students in computer science. Students conduct an independent research project and present the results. Individual instruction. May not be counted toward a master's degree in computer science. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### **C S 396M. Advanced Networking Protocols.**

Topics include routing, multiple access, internetworking, security, performance models, and verification methods. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **C S 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in computer science and consent of the graduate adviser; for 698B, Computer Science 698A.

#### **C S 398T. Supervised Teaching in Computer Science.**

Supervised teaching experience, and seminar focused on curriculum construction and teaching methods. Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and appointment as a teaching assistant.

#### **C S 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

#### **C S 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Computer Science 399R, 699R, or 999R.

## **Human Development and Family Sciences**

*Master of Arts  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Sarah M. and Charles E. Seay Building (SEA) 1.432A, phone (512) 475-8800, fax (512) 475-8662; campus mail code A2702

**Mailing address:** The University of Texas at Austin, Graduate Program in Human Development and Family Sciences, School of Human Ecology, 108 East Dean Keeton Street Stop A2702, Austin TX 78712

**E-mail:** [he-hdfgrad@utlists.utexas.edu](mailto:he-hdfgrad@utlists.utexas.edu)

**URL:** <http://www.he.utexas.edu/hdfs/graduate-program>

### **Facilities for Graduate Work**

The Department of Human Development and Family Sciences is housed in the Sarah M. and Charles E. Seay Building, which provides excellent resources for teaching and research. Computer facilities are extensive. In addition to the facilities of Information Technology Services, students have access to the department's computer laboratory, a state-of-the-art facility equipped with advanced computers and statistical software. These resources are supplemented by extensive computer equipment in individual faculty laboratories.

The Human Development and Family Sciences Reference Room houses a noncirculating collection of more than five hundred volumes and twenty journals.

The half-day preschool and infant/toddler programs of the Priscilla Pond Flawn Child and Family Laboratory provide a setting for research by faculty members and graduate students, a facility for student observation and training, and a model program for children and their families. They also provide opportunities for family involvement in the classroom, parent education programs, parent conferences, and family research. Because the laboratory has served Austin families for over eighty years, the opportunities for multigenerational and longitudinal research are significant.

The department has extensive facilities for observing and recording social interaction. The Marital and Family Interaction Laboratory is available for recording husband-wife and family interaction in a comfortable setting. The laboratory consists of a naturalistic living room connected to well-equipped control rooms that enable interactions to be recorded unobtrusively. The facility is augmented by numerous other one-way observation and coding rooms that enable recorded data to be analyzed using state-of-the-art computer-video analysis systems.

The department also has excellent facilities for conducting survey research. These include a series of individual interview rooms and a telephone research center.

Several rich sets of data, many of which include longitudinal data from families, are housed in the department and are available to graduate students for research. These sets of data focus on a wide range of topics, including the impact of courtship experiences on marriage; the prediction of divorce and remarriage and their impact on children; parent-child interaction; the connection between family and peer relationships; the connection between work roles and family relationships; and the impact of poverty, television, child care policy, and adoption policy on children.

## Areas of Study

The graduate program in human development and family sciences is designed to prepare students for research, teaching, and administrative positions in colleges and universities, as well as for positions in government, policy-related research organizations, and other public and private settings. The program emphasizes research and theory on the interplay among individual development, family relationships, and institutions outside the family. Development of the individual is considered within the contexts of the family, peer group, community, and culture. The family is studied as a system of relationships, with attention to roles, communication, conflict resolution and negotiation, and family members' perceptions of each other and of their family. Public policies and care settings outside the family are among the community influences considered in relation to the development of individuals and families. The program emphasizes the investigation of the family and other social processes that contribute to competence and optimal development in individuals from birth to maturity and how such competence is reflected in interpersonal relationships and family interactions.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Edward R Anderson	Nancy L Hazen-Swann
Aprile D Benner	Deborah B Jacobvitz
Robert Crosnoe	Su Yeong Kim
Theodore H Dix	Karrol A Kitt
Paul Eastwick	Judith H Langlois
Karen L Fingerman	Timothy J Loving
Elizabeth Thompson Gershoff	Lisa Ann Neff
Marci Elizabeth Joy Gleason	Anita L Vangelisti

## Degree Requirements

### Master of Arts

The master's degree requires completion of at least thirty-six semester hours of coursework; a core course sequence of fifteen semester hours, consisting of theoretical and methodological foundations courses; twelve hours in research and thesis; and nine hours of electives. The graduate program in human development and family sciences is designed primarily to lead to the Doctor of Philosophy degree. Students normally earn the

Master of Arts degree only in the course of work leading to the doctoral degree. Further information is available from the graduate adviser.

## Doctor of Philosophy

Detailed descriptions of admission procedures and program requirements are available from the graduate adviser. Work leading to the Doctor of Philosophy includes: (1) the substantive major, which consists of a cohesive sequence of courses in human development and family sciences and related disciplines; (2) coursework in research design and statistics; (3) the supporting program, which consists of work complementary to the substantive major; (4) ongoing supervised research experience; (5) a predoctoral research project (the equivalent of a master's thesis); (6) a series of field-relevant tasks, such as preparing manuscripts for publication and applying for external funding in order to advance to candidacy; and (7) the dissertation.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Human Development and Family Sciences: HDF

#### HDF 380K. Research Methods.

Two lecture hours and one and one-half laboratory hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in human development and family sciences, or graduate standing and consent of instructor.

**Topic 1: Research Methods in Human Development and Family Sciences.** Human Development and Family Sciences 480K (Topic 1) and 381K may not both be counted.

**Topic 2: Foundational Statistics and Nested Models in Human Development and Family Sciences.** This course focuses on data organization and statistics used in the social behavioral sciences. It begins with a review of basic data management, inferential statistics, graphing, advanced regression, and ANOVA, then concludes with an introduction into the analysis of nested data.

**Topic 3: Analyzing Development and Change.**

**Topic 4: Advanced Regression and Structural Models.**

#### HDF 192, 292, 392, 692. Research Problems.

Directed research in various topics in the area of human development and family sciences. One, two, three, or six lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in human development and family sciences, or graduate standing and consent of instructor.

**Topic 1: Child Development.**

**Topic 2: Family Relationships.**

**Topic 3: Marital Relationships.**

**Topic 4: Peer Relationships.**

**Topic 5: Parent-Child Relationships.**

**Topic 6: The Family and Public Policy.**

**Topic 7: The Family and the Mass Media.**

#### HDF 394. Graduate Seminar.

Seminars in various topics in the area of human development and family sciences. Three lecture hours a week for one semester. May be repeated

for credit when the topics vary. Prerequisite: Graduate standing in human development and family sciences, or graduate standing and consent of instructor.

**Topic 1: Parent-Child Interaction.**

**Topic 2: Family-Peer Relationships.**

**Topic 3: Marital Relationships.**

**Topic 4: Sex Roles in Family Relationships.**

**Topic 5: Immigration and the Family .**

**Topic 6: Intergenerational Parenting.**

**Topic 7: Divorce.**

**Topic 8: Family Systems Theory.**

**Topic 9: Children and Poverty.**

**Topic 10: Adult Development.**

**Topic 11: Issues in Early Childhood Development.**

**Topic 12: Attachment and Development through the Life Span.**

**Topic 13: The Self in Relationships.**

**Topic 14: Adoptive Family Relationships.**

**Topic 16: Development of Close Relationships.**

**Topic 17: Prevention, Intervention, and Evaluation in Human Development and Family Sciences.** Human Development and Family Sciences 394 (Topic: Prevention, Intervention, and Evaluation in Human Development and Family Sciences) and 394 (Topic 17) may not both be counted.

### **HDF 395. Recent Advances in Human Development and Family Sciences.**

Research and theory focused on the interplay between individual development, family relationships, and institutions and relationships outside the family. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in human development and family sciences, or graduate standing and consent of instructor.

**Topic 1: Child and Adolescent Development.**

**Topic 2: Contextual Influences on Individual and Family Development.**

**Topic 3: Adult Development and Aging.** A multidisciplinary overview of adult development from young adulthood through old age. Examines major sociological, psychological, and biological theory and research in the field of adult development such as adult development and the aging process from cells to social security with an emphasis on social and emotional development, as well as psychological aspects of adult development.

**Topic 4: The Formation and Development of Intimate Relationships.** Critical review of theory and research on dating and marital relationships, with an emphasis on how relationships change over time. Subjects include attraction, relationship initiation and formation, relationship maintenance processes and relationship dissolution.

### **HDF 397P. Practicum in Human Development and Family Sciences.**

Practicum hours to be arranged. Prerequisite: Graduate standing and consent of the graduate adviser.

### **HDF 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in human development and family sciences and consent of the graduate adviser; for 698B, Human Development and Family Sciences 698A.

### **HDF 398T. Supervised Teaching in Human Development and Family Sciences.**

Teaching under close supervision, group meetings, individual conferences, and reports. Conference course. Prerequisite: Graduate standing and appointment as a teaching assistant.

### **HDF 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **HDF 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Human Development and Family Sciences 399R, 699R, or 999R.

## **Human Ecology**

In addition to the following course, the School of Human Ecology offers graduate degree programs in human development and family sciences, nutritional sciences, and textile and apparel technology. These programs are described elsewhere in this chapter.

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### **Human Ecology: H E**

#### **H E 392. Research Problems.**

Problems may be chosen from the areas of family and consumer economics or textiles and apparel. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

## **Marine Science**

*Master of Science in Marine Science  
Doctor of Philosophy*

### **For More Information**

**Location:** 750 Channel View Drive, Port Aransas, phone (361) 749-6801, fax (361) 749-6777; campus mail code: T2500

**Mailing address:** University of Texas Marine Science Institute, Graduate Program, 750 Channel View Drive, Port Aransas TX 78373-5015

**E-mail:** gradinfo@utlists.utexas.edu

**URL:** <http://www.utmsi.utexas.edu/>

### **Facilities for Graduate Work**

Facilities for graduate work in marine science are located at the shoreside laboratory of the Marine Science Institute in Port Aransas. The institute is located on the Aransas Pass ship channel among the dunes at the tip of Mustang Island, with easy access to bays, beaches, and the Gulf of Mexico. Environmental systems nearby include the hypersaline Laguna Madre, seagrass meadows, fresh and salt water marshes, and the continental shelf. The Port Aransas facility offers a specialized library, classrooms, laboratories, and a flowing seawater system. The institute's fleet includes a fifty-seven foot trawler (*R/V Katy*) and ten smaller boats. In addition, there is a pool of four-wheel-drive vehicles for work in and

around the local habitats. The shoreside research and teaching facilities also include a cafeteria, dormitories, and graduate student apartments.

Graduate students take their early coursework in Austin, including supporting work in other departments. Many courses taught in Port Aransas are available to students on the Austin campus via videoteleconference facilities. Normally, one or two long semesters are spent in Austin. Most students then reside in Port Aransas while they undertake thesis and dissertation research at the Marine Science Institute. These students also take additional instruction at the Institute, including organized courses and seminars.

## Areas of Study

Graduate study is organized around a curriculum with three core areas: fish physiology and ecology, ecosystems dynamics, and biogeochemistry. Each of these broad core areas includes specialized topics. Further information is available from the graduate adviser.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Bryan Andrew Black	Lee A Fuiman
Edward J Buskey	Amber Hardison
Robert Wayne Dickey	Zhanfei Liu
Kenneth H Dunton	James W McClelland
Deana L Erdner	Peter Thomas
Brad Erisman	Tracy A Villareal
Andrew Jerome Esbaugh	Benjamin D Walther

## Admission Requirements

A prospective student's undergraduate training should include twenty-four semester hours in one of the life or physical sciences. At least twelve of these hours must be in upper-division work. Adequate preparation in mathematics is expected of all students.

## Degree Requirements

### Master of Science in Marine Science

For the master's degree, students must complete at least thirty semester hours of acceptable graduate work in marine science and related natural sciences, including Marine Science 698. Each student must complete the three core courses listed below and is expected to complete two advanced courses in marine science as required by the Graduate Studies Committee or the supervising committee. A minimum of six semester hours of coursework outside of the area of specialization selected by the student and approved by the graduate adviser and supervising professor make up the minor or supporting area.

### Doctor of Philosophy

Doctoral candidates must complete the three core courses listed below, for a total of twelve hours. While additional courses are not specified, each student is expected to complete two advanced courses in marine science, as required by the Graduate Studies Committee or the supervising committee. A minimum of six semester hours of coursework outside of the area of specialization selected by the student and approved by the graduate adviser and supervising professor make up the minor or supporting area.

Students are expected to fulfill all requirements for candidacy by the end of the fifth long session semester after arrival at the University. This involves, as a minimum, completion of the required core courses and

passage of a candidacy examination to demonstrate competence in the core areas and mastery of the chosen area of specialization, as well as selection of a dissertation committee and supervising professor.

Further information on graduate work and on available fellowships and assistantships may be found at the Marine Science Institute's Web site (<http://www.utmsi.utexas.edu>) and by consultation with the graduate adviser.

## Core Courses

Marine Science 481C, *Marine Ecosystem Dynamics*  
Marine Science 482C, *Marine Biogeochemistry*  
Marine Science 483C, *Adaptations to the Marine Environment*

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## Marine Science: MNS

### MNS 180, 380, 680. Research in Marine Science.

Restricted to students in marine science. For each semester hour of credit earned, the equivalent of one class hour a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

### MNS 481C. Marine Ecosystem Dynamics.

Interactions between organisms and the physical processes that regulate productivity and distribution of marine life in oceanic and coastal ecosystems. Four lecture hours a week for one semester. Prerequisite: Graduate standing; and either consent of instructor or the following: six semester hours of coursework in biological sciences chosen from Biology 311C, 311D, and the equivalent; and Chemistry 301 and 302, or the equivalent.

### MNS 382. Principles of Marine Science.

Lectures, laboratory, and fieldwork. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 6: Marine Ichthyology.** Systematics of fishes, including major classifications, comparative anatomy, embryology, and general distribution. Additional prerequisite: Comparative vertebrate anatomy or consent of instructor.

**Topic 9: Endocrinology.** Endocrinology, with special reference to lower vertebrates and the evolution of control systems. Marine Science 352 (Topic 9: Endocrinology) and 382 (Topic 9) may not both be counted. Additional prerequisite: Courses in physiology and consent of instructor.

**Topic 14: Biology of Seagrasses.** Analyses of plant and animal characteristics of seagrass ecosystems, including biomass, reciprocal salinity transplants, productivity. Marine Science 352 (Topic 14: Biology of Seagrasses) and 382 (Topic 14) may not both be counted.

### MNS 482C. Marine Biogeochemistry.

Study of chemical, biological, geological, and physical processes that influence cycling of bioactive elements in marine waters and sediments. Four lecture hours a week for one semester. Prerequisite: Graduate standing; and either consent of instructor or the following: Physical Science 303 and 304, or the equivalent; Chemistry 301, 302, 310M,

and 310N, or the equivalent; and six semester hours of coursework in biological sciences chosen from Biology 311C, 311D, and the equivalent.

### **MNS 383. Topics in Marine Science.**

Two lecture hours and one laboratory hour a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Biogeochemistry of Carbon.** Production, distribution, composition, and preservation of organic matter in the sea. Marine Science 353 (Topic 1: Biogeochemistry of Carbon) and 383 (Topic 1) may not both be counted.

**Topic 7: Isotope Ecology.** Consideration of the stable hydrogen, carbon, nitrogen, and sulfur stable isotope ratio variations in ecological settings, including chemical fundamentals; current literature on food-webs and source studies. Additional prerequisite: Graduate standing in one of the natural sciences.

**Topic 8: Benthic Plants and Animals.** Interactions among organisms, sediments, and physical processes of estuarine systems, including the factors that regulate primary and secondary productivity.

**Topic 10: Methods in Marine Science.** Introduction through laboratory and field work to the methods of marine science and oceanographic research. Topics include small boat handling and safety; field collection of physical, chemical, and biological data; and laboratory analysis of seawater chemistry and marine organisms.

**Topic 11: Global Change.** Study of natural and anthropogenically mediated changes in the earth's climate and biogeochemical cycles.

**Topic 12: Larval Fish Ecology.** The ecology of marine fish larvae in relation to fisheries oceanography and aquaculture. Additional prerequisite: Ability to use the World Wide Web and knowledge of Microsoft Excel.

**Topic 13: Marine Botany.** Introduction through lectures and field work to the diversity and importance of marine vegetation of the South Texas coast. Includes the evolution, taxonomy, ecology, physiology, and trophic importance of marine vegetation.

**Topic 14: Marine Isotope Geochemistry.** The use of isotopes (stable, radiogenic, uranium series, and anthropogenic) in the study of marine science.

**Topic 15: Molecular Methods in Marine Science.** Introduction to the principles and methods of molecular biology and the application of molecular techniques to research in marine science.

**Topic 16: Zooplankton Ecology.** Advanced study of the morphological, physiological, and behavioral adaptations of zooplankton to their environment.

**Topic 17: Coastal Watersheds.** Covers water use, land use and land cover change, and climate change as they relate to biological, physical, and geochemical processes in watersheds. Includes the impact of changing watershed export on coastal ocean ecosystems. Emphasizes case studies on different regions of the United States.

### **MNS 483C. Adaptations to the Marine Environment.**

The physiological basis for organismal and population-level responses to marine environments. Four lecture hours a week for one semester. Prerequisite: Graduate standing; and either consent of instructor or the following: six semester hours of coursework in biological sciences chosen from Biology 311C, 311D, and the equivalent; and Chemistry 301 and 302, or the equivalent.

### **MNS 384C. Benthic Ecology.**

Interactions among organisms, sediments, and physical processes of estuarine and oceanic bottoms. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Marine Science 354 or the equivalent, and consent of instructor.

### **MNS 384E. Marine Microbial Ecology.**

Metabolism of photosynthetic and chemosynthetic microorganisms in the sea. Three lecture hours and eight laboratory hours a week for one semester. Marine Science 354E and 384E may not both be counted. Prerequisite: Graduate standing; six semester hours of coursework in biological science chosen from Biology 311C, 311D, or the equivalent; Chemistry 301 and 302, or the equivalent; and consent of instructor.

### **MNS 384F. Marine Geology.**

Development of ocean basins; marine and coastal depositional environments, processes, and sedimentary parameters; marine field techniques. Three lecture hours a week for one semester. Marine Science 354F and 384F may not both be counted. Prerequisite: Graduate standing; six semester hours of coursework in general chemistry or mineralogy; six semester hours of coursework in biology or paleontology; and six semester hours of upper-division coursework in geological sciences or consent of instructor.

### **MNS 384J. Marine Ecology.**

Principles of competition and of predator-prey, herbivore-plant, and reproductive interactions within diverse marine phyla. Three lecture hours a week for one semester. Prerequisite: Graduate standing, a basic course in biological science, and consent of instructor.

### **MNS 384K. Ecology of Fishes.**

Organismal, population, and community ecology of marine and freshwater fishes. Three lecture hours a week for one semester. Prerequisite: Graduate standing in marine science or biological sciences; and consent of instructor.

### **MNS 384L. Marine Chemistry.**

Chemical processes in the sea. Three lecture hours and eight laboratory hours a week for one semester. Prerequisite: Graduate standing, general physics, and six semester hours of upper-division coursework in chemistry.

### **MNS 384T. Biological Oceanographic Processes.**

An advanced course in biological processes in oceanic and coastal waters, with emphasis on empirical and theoretical concepts of marine ecosystem dynamics, primary and secondary production, and detrital cycling. Three lecture hours and eight laboratory hours a week for one semester. Prerequisite: Graduate standing; and either consent of instructor or the following: six semester hours of coursework in biological sciences chosen from Biology 311C, 311D, and the equivalent; and Chemistry 301 and 302, or the equivalent.

### **MNS 384U. Reproductive Physiology of Fishes.**

Endocrine and environmental control of reproductive cycles in teleost fishes. Three lecture hours a week for one semester. Prerequisite: Graduate standing, a beginning course in physiology, and consent of instructor.

### **MNS 385E. Marine Macrophytes.**

A lecture, laboratory, and field course that examines the systematics, ecology, and productivity of marine macroalgae and seagrasses, strategies and seasonal patterns of growth, photosynthesis, and carbon metabolism in relation to in situ light environments. Three lecture hours a week for one semester, with forty hours of laboratory and fieldwork. Prerequisite: Graduate standing, six semester hours of upper-division coursework in biology, and consent of instructor.

### **MNS 385F. Environmental Modeling.**

Introductory course in modeling, with emphasis on the models used in ecology, oceanography, and earth sciences. Two lecture hours and one

and one-half laboratory hours a week for one semester. Prerequisite: Graduate standing in marine science and consent of instructor.

### **MNS 386. Phytoplankton Ecology.**

The interactions of physiology, morphology, and behavior of microalgae with physical, chemical, and biological features of the environment as related to the distribution of marine phytoplankton. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor. Biology 478L; 448L or 455L; and 456L or 373.

### **MNS 387. Pelagic Ecosystems.**

Advanced study of processes affecting the distribution and abundance of marine planktonic and nektonic organisms, primary and secondary production in marine pelagic environments, and food web interactions in the pelagia. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **MNS 188, 388. Marine Research Training Cruise.**

Shipboard training in marine research through participation in research projects and completion of report. One five- to seven-day cruise; additional laboratory work is required for 388. Prerequisite: Graduate standing and consent of instructor.

### **MNS 191. Seminar in Marine Science.**

Recent advances in the marine sciences, discussed by students, faculty and staff members, and guest lecturers. Topics to be announced. One lecture hour a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **MNS 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in marine science and consent of the graduate adviser; for 698B, Marine Science 698A.

### **MNS 398T. Supervised Teaching in Marine Science.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **MNS 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **MNS 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Marine Science 399R, 699R, or 999R.

## **Mathematics**

*Master of Arts  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Robert Lee Moore Hall (RLM) 8.100, phone (512) 471-7711, fax (512) 471-9038; campus mail code: C1200

**Mailing address:** The University of Texas at Austin, Department of Mathematics, Attn: Graduate Program, 2515 Speedway C1200, Austin TX 78712-1202

**E-mail:** gradadv@math.utexas.edu

**URL:** <http://www.ma.utexas.edu/>

## **Facilities for Graduate Work**

The Kuehne Physics Mathematics Astronomy Library (<http://www.lib.utexas.edu/pma>) has a broad range of mathematical literature for study and research. The collection offers access to a wide variety of print-based and electronic research tools, including bibliographic databases and research and teaching journals in all areas of mathematics. The collection of e-journals is extensive. Electronic resources are accessible through the University Libraries Web site (<http://www.lib.utexas.edu>).

The Department of Mathematics computer system is available for use in connection with courses and investigations in both pure and applied mathematics.

## **Areas of Study**

Graduate study in mathematics is offered in the areas of algebra, number theory, analysis, topology, geometry, applied mathematics, probability and statistics, numerical analysis, network and information theory, and actuarial mathematics.

## **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Daniel J Allcock	Francesco Maggi
Todd J Arbogast	Lauren A Meyers
Francois Baccelli	Amir Mohammadi
Chandrajit L Bajaj	J S Moore II
William Beckner	Peter Mueller
David D Ben-Zvi	Hossein Namazi
Andrew Justin Blumberg	Andrew M Neitzke
Lewis P Bowen	J T Oden
Patrick L Brockett	Natasa Pavlovic
Luis A Caffarelli	Timothy Perutz
Thomas Chen	Charles L Radin
Mirela Ciperiani	Alan W Reid
Alan K Cline	Kui Ren
Jeffrey E Danciger	Lorenzo A Sadun
Katherine M Davis	Travis Schedler
Bjorn Engquist	Mihai Sirbu
Alessio Figalli	Michael P Starbird
Daniel S Freed	Philip U Treisman
Irene M Gamba	Yen-Hsi Tsai
John E Gilbert	Jeffrey D Vaaler
Robert E Gompf	Alexis F Vasseur
Oscar Gonzalez	Mikhail M Vishik
Cameron M Gordon	Jose F Voloch
Ronny Hadani	Stephen G Walker
Raymond C Heitmann	Rachel A Ward
Arie Israel	Tandy Warnow
Sean M Keel	Mary F Wheeler
Daniel F Knopf	Thaleia Zariphopoulou
Hans A Koch	Gordan Zitkovic
John E Luecke	David I Zuckerman

## **Degree Requirements**

### **Master of Arts**

Most students take thirty semester hours of coursework and the report course. The thirty hours are divided into major and minor areas. The major consists of mathematics courses, and the minor area consists of courses that are related to mathematics. Students should consult the graduate adviser about the courses that are allowable for the minor.



Students must complete eighteen to twenty-four hours in the major area and six to twelve hours in the minor area. Some students qualify for an option of completing thirty-three semester hours of coursework (eleven courses) without thesis or report; consult the graduate adviser for details.

A special concentration in actuarial mathematics is available. Students in this concentration may select one of two options. The report option requires thirty semester hours of coursework (ten courses) and the report course. The option without thesis or report requires thirty-three semester hours of coursework (eleven courses). The major and minor requirements are the same as those described in the preceding paragraph except that the option without thesis or report requires seven to nine courses in the major area and two to four courses in the minor area. For both options, no more than nine semester hours of upper-division coursework may be counted.

## Doctor of Philosophy

A detailed description of the procedure for admission to candidacy is available from the graduate adviser. Each student is first required to pass preliminary examinations. A small advisory committee is then set up to approve the student's choice of coursework. This committee administers an advanced examination in the chosen area of specialization. The preliminary examinations are given once each semester. The advanced examination may be given by mutual agreement of the student and the advisory committee at any time after the student has passed the preliminary examinations, but before the end of the student's third year; the student must pass the advanced examination before admission to candidacy will be approved.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Mathematics: M

#### M 380C. Algebra.

A survey of algebraic structures, including groups, fields, rings, and modules. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor or the graduate adviser.

#### M 380D. Algebra.

Continuation of Mathematics 380C. Three lecture hours a week for one semester. Prerequisite: Graduate standing, consent of instructor or the graduate adviser, and Mathematics 380C.

#### M 381C. Real Analysis.

Measure and integration over abstract spaces; Lebesgue's theory of integration and differentiation on the real line. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 381R, Computational Science, Engineering, and Mathematics 385R, Mathematics 381C. Prerequisite: Graduate standing and consent of instructor or the graduate adviser.

#### M 381D. Complex Analysis.

Same as Computational Science, Engineering, and Mathematics 385S. Introduction to complex analysis. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 381D, Computational Science, Engineering, and

Mathematics 385S, Mathematics 381D. Prerequisite: Graduate standing and consent of instructor or the graduate adviser.

#### M 381E. Functional Analysis.

Introduction to functional analysis. Three lecture hours a week for one semester. Computational and Applied Mathematics 381S and Mathematics 381E may not both be counted. Prerequisite: Graduate standing; Computational Science, Engineering, and Mathematics 385R (or Computational and Applied Mathematics 381R) or Mathematics 381C; and consent of instructor or the graduate adviser.

#### M 382C. Algebraic Topology.

Surfaces, covering spaces, fundamental group, and homology. Three lecture hours a week for one semester. Prerequisite: Graduate standing, an undergraduate course in topology, and consent of instructor or the graduate adviser.

#### M 382D. Differential Topology.

Continuation of Mathematics 382C. Manifolds and maps, differential forms, transversality, and intersection theory. Three lecture hours a week for one semester. Prerequisite: Graduate standing, consent of instructor or the graduate adviser, and Mathematics 382C.

#### M 382E. Advanced Algebraic Topology.

Continuation of Mathematics 382C. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor or the graduate adviser.

#### M 382F. Algebraic Topology.

Continuation of Mathematics 382E. Three lecture hours a week for one semester. Prerequisite: Graduate standing, consent of instructor or the graduate adviser, and Mathematics 382E.

#### M 382G. Differential Geometry.

Continuation of Mathematics 382D. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor or the graduate adviser.

#### M 383C. Methods of Applied Mathematics.

Same as Computational Science, Engineering, and Mathematics 386C. Topics include basic normed linear space theory; fixed-point theorems and applications to differential and integral equations; Hilbert spaces and the spectral theorem; applications to Sturm-Liouville problems; approximation and computational methods such as the Galerkin, Rayleigh-Ritz, and Newton procedures. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 385C, Computational Science, Engineering, and Mathematics 386C, Mathematics 383C. Prerequisite: Graduate standing.

#### M 383D. Methods of Applied Mathematics.

Same as Computational Science, Engineering, and Mathematics 386D. Topics include distributions, fundamental solutions of partial differential equations, the Schwartz space and tempered distributions, Fourier transform, Plancherel theorem, Green's functions, Sobolev spaces, weak solutions, differential calculus in normed spaces, implicit function theorems, applications to nonlinear equations, smooth variational problems, applications to classical mechanics, constrained variational problems. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 385D, Computational Science, Engineering, and Mathematics 386D, Mathematics 383D. Prerequisite: Graduate standing; and Computational Science, Engineering, and Mathematics 386C (or Computational and Applied Mathematics 385C) or Mathematics 383C.

### **M 383E. Numerical Analysis: Linear Algebra.**

Same as Computer Science 383C, Computational Science, Engineering, and Mathematics 383C, and Statistics and Data Sciences 393C. Survey of numerical methods in linear algebra: floating-point computation, solution of linear equations, least squares problems, algebraic eigenvalue problems. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 383C, Computational Science, Engineering, and Mathematics 383C, Computer Science 383C, Mathematics 383E, Statistics and Data Sciences 393C, Statistics and Scientific Computation 393C. Prerequisite: Graduate standing; Computer Science 367 or Mathematics 368K; and Mathematics 340L, 341, or consent of instructor.

### **M 383F. Numerical Analysis: Interpolation, Approximation, Quadrature, and Differential Equations.**

Same as Computer Science 383D, Computational Science, Engineering, and Mathematics 383D, and Statistics and Data Sciences 393D. Survey of numerical methods for interpolation, functional approximation, integration, and solution of differential equations. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 383D, Computational Science, Engineering, and Mathematics 383D, Computer Science 383D, Mathematics 383F, Statistics and Data Sciences 393D, Statistics and Scientific Computation 393D. Prerequisite: Graduate standing; Computational Science, Engineering, and Mathematics 383C (or Computational and Applied Mathematics 383C), Computer Science 383C, Mathematics 383E, or Statistics and Data Sciences 393C (or Statistics and Scientific Computation 393C); and Mathematics 427K and 365C, or consent of instructor.

### **M 384C. Mathematical Statistics I.**

Mathematics X84C is same as Computational Science, Engineering, and Mathematics 384R and Statistics and Data Sciences 384 (Topic 2). The general theory of mathematical statistics. Includes distributions of functions of random variables, properties of a random sample, principles of data reduction, an overview of hierarchical models, decision theory, Bayesian statistics, and theoretical results relevant to point estimation, interval estimation, and hypothesis testing. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 384R, Computational Science, Engineering, and Mathematics 384R, Mathematics 384C, Statistics and Data Sciences (Topic 2), Statistics and Scientific Computation 384 (Topic 2). Prerequisite: Graduate standing; and Mathematics 362K and 378K, Statistics and Scientific Computation 382, or consent of instructor.

### **M 384D. Mathematical Statistics II.**

Mathematics X84D is same as Computational Science, Engineering, and Mathematics 384S and Statistics and Data Sciences 384 (Topic 3). Continuation of Computational Science, Engineering, and Mathematics 384R and Mathematics 384C. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 384S, Computational Science, Engineering, and Mathematics 384S, Mathematics 384D, Statistics and Data Sciences 384 (Topic 3), Statistics and Scientific Computation 384 (Topic 3: Mathematical Statistics II). Prerequisite: Graduate standing; Computational Science, Engineering, and Mathematics 384R (or Computational and Applied Mathematics 384R), Mathematics 384C, or Statistics and Scientific Computation 384 (Topic 2: Mathematical Statistics I); and Mathematics 362K and 378K, Statistics and Data Sciences 382 (or Statistics and Scientific Computation 382), or consent of instructor.

### **M 384E. Design and Analysis of Experiments.**

Mathematics X84E is same as Computational Science, Engineering, and Mathematics 384U and Statistics and Data Sciences 384 (Topic 6). Design and analysis of experiments, including one-way and two-

way layouts; components of variance; factorial experiments; balanced incomplete block designs; crossed and nested classifications; fixed, random, and mixed models; and split plot designs. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 384U, Computational Science, Engineering, and Mathematics 384U, Mathematics 384E, Statistics and Data Sciences 384 (Topic 6), Statistics and Scientific Computation 384 (Topic 6: Design and Analysis of Experiments). Prerequisite: Graduate standing; and Mathematics 362K and 378K, Statistics and Data Sciences 382 (or Statistics and Scientific Computation 382), or consent of instructor.

### **M 384F. Design of Experiments.**

Design of experiments, including  $2n$  and  $3n$  factorial experiments, confounding, fractional factorials, sequential experimentation, orthogonal arrays, D-optimal experiments, and response surface methodology. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Mathematics 378K or the equivalent or consent of instructor.

### **M 384G. Regression Analysis.**

Same as Computational Science, Engineering, and Mathematics 384T and Statistics and Data Sciences 384 (Topic 4). Simple and multiple linear regression, inference in regression, prediction of new observations, diagnosis and remedial measures, transformations, and model building. Emphasis on both understanding the theory and applying theory to analyze data. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 384T, Computational Science, Engineering, and Mathematics 384T, Mathematics 384G, Statistics and Data Sciences 384 (Topic 4), Statistics and Scientific Computation 384 (Topic 4: Regression Analysis). Prerequisite: Graduate standing; and Mathematics 362K and 378K, Statistics and Data Sciences 382, (or Statistics and Scientific Computation 382), or consent of instructor.

### **M 384H. Multivariate Statistical Analysis.**

Introduction to the general multivariate linear model; a selection of techniques, such as principle component, factor, and discriminant analysis. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **M 385C. Theory of Probability.**

Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 384K, Computational Science, Engineering, and Mathematics 384K, Mathematics 385C. Prerequisite: Graduate standing and consent of instructor.

### **M 385D. Theory of Probability.**

Same as Computational Science, Engineering, and Mathematics 384L. Continuation of Computational Science, Engineering, and Mathematics 384K and Mathematics 385C. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 384L, Computational Science, Engineering, and Mathematics 384L, Mathematics 384L, 385D. Prerequisite: Graduate standing; Computational Science, Engineering, and Mathematics 384K (or Computational and Applied Mathematics 384K) or Mathematics 385C; and consent of instructor.

### **M 387C. Numerical Analysis: Algebra and Approximation.**

Same as Computational Science, Engineering, and Mathematics 383K. Advanced introduction to scientific computing, theory and application of numerical linear algebra, solution of nonlinear equations, and numerical approximation of functions. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 386K, Computational Science, Engineering, and

Mathematics 383K, Mathematics 387C. Prerequisite: Graduate standing, and consent of instructor or the graduate adviser.

### **M 387D. Numerical Analysis: Differential Equations.**

Same as Computational Science, Engineering, and Mathematics 383L. Advanced introduction to the theory and practice of commonly used numerical algorithms for the solution of ordinary differential equations, and elliptic, parabolic, and hyperbolic partial differential equations. Three lecture hours a week for one semester. Prerequisite: Graduate standing; and Computer Science 383C, Mathematics 387C (or 383G), or consent of instructor.

### **M 389D. Introduction to Financial Mathematics for Actuaries.**

Covers the financial derivative topics on the Society of Actuary FM/2 exam: general derivatives, options, hedging, investment strategies, forwards, futures, and swaps. Covers option pricing techniques in the MFE/3F exam: binomial option pricing, Monte Carlo Valuation using risk neutral probabilities, and Black-Scholes. Three lecture hours a week for one semester. Prerequisite: Mathematics 389F.

### **M 389F. Theory of Interest.**

Measurement of interest, present and accumulated value, amortization, sinking funds, bonds, duration, and immunization. Covers the interest theory portion of an exam of the Society of Actuaries and the Casualty Actuarial Society. Three lecture hours a week for one semester. Actuarial Foundations 329 and Mathematics 389F may not both be counted. Prerequisite: Graduate standing and Mathematics 408D or 408L.

### **M 389J. Probability Models with Actuarial Applications.**

Introductory actuarial models for life insurance, property insurance, and annuities. With Mathematics 389P, covers the syllabus for the professional actuarial exam on model construction. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Mathematics 358K or 378K with a grade of at least C.

### **M 389P. Actuarial Statistical Estimates.**

Statistical estimation procedures for random variables and related quantities in actuarial models. With Mathematics 389J, covers the syllabus for the professional actuarial exam on model construction. Three lecture hours a week for one semester. Prerequisite: Graduate standing; and Mathematics 341 or 340L, and 389J with a grade of at least C in each.

### **M 189S. Seminar on Actuarial Practice.**

Presentations by working actuaries on current issues in actuarial practice. One lecture hour a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing; and Actuarial Foundations 329 or Mathematics 389F, and Mathematics 389J or 389U with a grade of at least C in each.

### **M 389T. Time Series and Survival-Model Estimation.**

Introduction to the probabilistic and statistical properties of time series; parameter estimation and hypothesis testing for survival models. Covers 30 percent of the syllabus for exam #4 of the Society of Actuaries and the Casualty Actuarial Society. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Mathematics 341 or 340L, 358K or 378K, and 389U.

### **M 389U. Actuarial Contingent Payments I.**

Intermediate actuarial models for life insurance, property insurance, and annuities. Three lecture hours a week for one semester. Prerequisite: Graduate standing; Mathematics 362K with a grade of at least C; credit with a grade of at least C or registration for Mathematics 340L (or

341); and credit with a grade of at least C or registration for Actuarial Foundations 329 or Mathematics 389F.

### **M 389V. Actuarial Contingent Payments II.**

Advanced actuarial models for life insurance, property insurance, and annuities. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Mathematics 389F and 389U with a grade of at least C in each.

### **M 389W. Financial Mathematics for Actuarial Applications.**

Subjects include pricing, stock price, and interest rate models for actuarial applications. Tools include lognormal distribution, Brownian motion, Black-Scholes, and delta hedging. Three lecture hours a week for one semester. Prerequisite: Mathematics 389D with a grade of at least C-.

### **M 390C. Topics in Algebra.**

Recent topics have included algebraic geometry, number theory, algebraic curves, algebraic number theory, algebraic functions, rational curves on varieties, homological algebra. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **M 391C. Topics in Analysis.**

Recent topics have included measure and integration, real variables, complex analysis, functional analysis, ordinary differential equations, partial differential equations, integral transforms, operator theory, approximation theory, abstract harmonic analysis. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **M 392C. Topics in Topology.**

Recent topics have included algebraic topology, differential topology, geometric topology, Lie groups. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **M 393C. Topics in Applied Mathematics.**

Recent topics have included quantum mechanics, statistical physics, ergodic theory, group representations, statistical mechanics, quantum field theory, introductory partial differential equations, monotone operators and partial differential equations, Hilbert space methods for partial differential equations, Hamiltonian dynamics, nonlinear functional analysis, Euler and Navier-Stokes equations, microlocal calculus and spectral asymptotics, calculus of variations. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **M 393N. Numerical Solution of Elliptic Partial Differential Equations.**

Same as Computer Science 393N. The numerical solution of large systems of linear algebraic equations arising in the solution of elliptic partial differential equations by discretization methods. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 393N, Computational Science, Engineering and Mathematics 393N, Mathematics 393N. Prerequisite: Graduate standing; and Computational Science, Engineering, and Mathematics 383K (or Computational and Applied Mathematics 386K), Computer Science 386K, Mathematics 387C (or 383G), or consent of instructor.

### **M 394C. Topics in Probability and Statistics.**

Mathematics X94C is same as Computational and Applied Mathematics 394C. Recent topics have included nonparametric statistics, advanced probability. Three lecture hours a week for one semester. May be

repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **M 395C. Topics in Logic and Foundations.**

Recent topics have included set theory, model theory, proof theory, axiomatic theorem proving, automatic theorem proving, foundations of mathematics, recursion theory. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **M 396C. Topics in Mathematics.**

Recent topics have included set theory, history of mathematics. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **M 396D. Conference Course.**

Supervised study in mathematics. Conference course. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **M 397C. Topics in Numerical Analysis.**

Recent developments and advanced topics in the field of numerical analysis. Three lecture hours a week for one semester. Mathematics 393D and 397C may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **M 197S, 397S. Seminar in Mathematics.**

One or three lecture hours a week for one semester. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **M 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in mathematics and consent of the graduate adviser; for 698B, Mathematics 698A.

### **M 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in mathematics and consent of the supervising professor and the graduate adviser.

### **M 398T. Supervised Teaching in Mathematics.**

Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and appointment as a teaching assistant.

### **M 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **M 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Mathematics 399R, 699R, or 999R.

## **Neuroscience**

*Master of Science in Neuroscience  
Doctor of Philosophy*

## **For More Information**

**Campus address:** Norman Hackerman Building Building (NHB) 2.504, phone (512) 471-3640, fax (512) 471-0390; campus mail code: C7000

**Mailing address:** The University of Texas at Austin, Institute for Neuroscience, 100 E 24th Street Stop C7000, Austin TX 78712

**E-mail:** [neuroscience@mail.clm.utexas.edu](mailto:neuroscience@mail.clm.utexas.edu)

**URL:** <http://neuroscience.utexas.edu/>

## **Facilities for Graduate Work**

The Institute for Neuroscience offers excellent opportunities for multidisciplinary graduate study in the neurosciences. Facilities include those maintained by the participating programs in the Colleges of Natural Sciences, Liberal Arts, Pharmacy, Education, Communication, and in the Cockrell School of Engineering. Institutional support, training grants, and federal and state grants to investigators in the institute provide stipends and support research. Faculty members throughout the institute participate in interdisciplinary seminars, two semester-long broadly based neuroscience courses and multiple topically oriented neuroscience courses. The goal of the institute is to train students to employ multidisciplinary approaches in their careers in neuroscience research and teaching. Toward this end, the faculty seeks to provide a diverse, cohesive, and interactive atmosphere and a flexible curriculum that meets the needs of each individual.

## **Areas of Study**

Neuroscience encompasses behavioral, systems, cellular, molecular, and computational approaches to understanding the nervous system. The faculty use a wide variety of state-of-the-art techniques for their studies, including functional magnetic and optical imaging, various behavioral analyses of animals and humans, transmission and scanning electron microscopy, molecular and cellular biophysics, cellular- and systems-level neurophysiology, biochemistry, molecular genetics, and various types of computer modeling. The research-intensive environment emphasizes multidisciplinary investigations. The program offers students both a sound education in neuroscience and a broad research experience.

## **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Lawrence D Abraham  
Seema Agarwala  
Richard W Aldrich  
Greg Allen  
Nigel S Atkinson  
Chandrajit L Bajaj  
Dana H Ballard  
Jennifer S Beer  
Adela Ben-Yakar  
George D Bittner  
James Booth  
Alan C Bovik  
Craig A Champlin  
Bharath Chandrasekaran  
Jessica A Church-Lang  
Laura Lee Colgin  
Lawrence K Cormack  
Yvon Delville  
Juan M Dominguez  
Michael P Domjan  
Michael Drew  
Andrew K Dunn  
Christine L Duvauchelle  
Johann K Eberhart  
Ila P Fiete  
Richard H Finnell  
Wilson S Geisler III  
Nace L Golding  
Rueben A Gonzales  
F Gonzalez-Lima  
Andrea C Gore  
Lisa Griffin  
Jeffrey M Gross  
Andreana P Haley  
Kristen M Harris  
R A Harris  
Mary M Hayhoe

Maya L Henry  
Johann Hofmann  
Alexander C Huk  
Jody Jensen  
Daniel Johnston  
Theresa A Jones  
Robert A Josephs  
Hongjoo J Lee  
Jarrod Alan Lewis-Peacock  
W T Maddox  
Michela Marinelli  
Michael Mauk  
Robert Messing  
S J Mihic  
Risto P Miikkulainen  
Marie H Monfils  
Hitoshi Morikawa  
Richard A Morrisett  
Somshuvra Mukhopadhyay  
Ian Michael Nauhaus  
Hiroshi Nishiyama  
Steven M Phelps  
Jonathan T Pierce-Shimomura  
Martin Poenie  
George D Pollak  
Alison R Preston  
Nicholas J Priebe  
Kimberly Raab-Graham  
Michael J Ryan  
Timothy J Schallert  
David M Schnyer  
Eyal Seidemann  
Jason B Shear  
D M Snodderly  
Harold H Zakon  
Boris Zemelman

be approved by the student's faculty supervisor and program graduate adviser.

## Doctor of Philosophy

Students must complete a core curriculum that includes Neuroscience 482T, *Principles of Neuroscience I*; Neuroscience 383T, *Principles of Neuroscience II*; a statistics course; an ethics course; four graduate elective courses in neuroscience; and a graduate seminar in neuroscience. A qualifying exam is taken in the spring of the second year in which the student prepares a written proposal and defends it before an examining committee made up of Institute for Neuroscience faculty members who are experts in the scientific areas covered by the proposal. All eligible students must submit a predoctoral fellowship application by their third year of study, and all students must serve as teaching assistants for undergraduate or graduate courses.

## Dual Degree Program

### Doctor of Philosophy/Doctor of Medicine

The graduate program in neuroscience participates in a dual degree program with the University of Texas Medical Branch at Galveston (UTMB). Applicants must apply separately to and be admitted to both the PhD program in neuroscience at the University of Texas at Austin and the medical school at UTMB; this program is not accepting new applications. Students accepted into the dual degree program spend their first two years in the medical school at UTMB, followed by three to four years of doctoral work at UT Austin and eighteen months of clinical rotations. The degrees are conferred separately by each institution. Additional information may be found at the MD-PhD dual degree program Web site (<http://www.mdphd.utexas.edu>).

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

Courses in other fields of study that are related to the graduate program in neuroscience are described in other sections of this catalog. A list of these courses is available from the advising office.

### Neuroscience: NEU

#### NEU 380E. Vision Systems.

Introduction to the anatomy, physiology, and psychophysics of human vision from an information-processing and computational perspective. Three lecture hours a week for one semester. Neuroscience 380E and Psychology 380E may not both be counted. Prerequisite: Graduate standing and consent of instructor.

#### NEU 380G. Visual Neuroscience.

Physiology of the eye, the retina, and the visual pathways. Nutritional influences on risks for blinding diseases. Functional and ecological adaptations of primate vision. Three class hours a week for one semester. Neuroscience 380G and 385L (Topic: Visual Neuroscience) may not both be counted. Prerequisite: Graduate standing and consent of instructor.

#### NEU 080M. Dual MD/PhD Program with UT Medical Branch.

Preclinical medical study at the University of Texas Medical Branch at Galveston. May not be taken concurrently with another course at

## Admission Requirements

The requirements of the Graduate School for admission into a Doctor of Philosophy degree program must be met. However, the qualifications of most admitted applicants exceed these minimum requirements. All applicants must hold a bachelor's degree from an accredited college or university, usually in a biological science, chemistry, computer science, experimental psychology, pharmacy, or engineering. Undergraduate preparation should include one year of chemistry, one year of biology, mathematics through calculus, and courses in psychology and physics. However, students without some of these prerequisites may be admitted on the condition that they make up any deficiencies during their first two years of study.

## Degree Requirements

### Master of Science in Neuroscience

This degree has two tracks: a research track and a coursework-only track. Students in both tracks must complete thirty semester hours of coursework. Required courses for both tracks include two core courses in neuroscience (Neuroscience 482T, *Principles of Neuroscience I*, and Neuroscience 383T, *Principles of Neuroscience II*), a statistics course, and elective courses tailored to the student's interests and background. Students who select the research track must take at least six hours of thesis coursework, and they must submit a thesis based on their individual research during their final semester in the program. All coursework must

the University of Texas at Austin. Prerequisite: Graduate standing and admission to the MD/PhD dual degree program in neuroscience.

### **NEU 381N. Basic Processes of Nerve Cells.**

Same as Biology 381N. Degeneration and regeneration in nervous systems following traumatic injury; invertebrate versus vertebrate, peripheral nervous system versus central nervous system, axonal versus cell body, role of glia versus neurons. Three lecture hours a week for one semester. Only one of the following may be counted: Biology 381K (Topic 10), 381N, Neuroscience 381N, 385L (Topic 1). Prerequisite: Graduate standing.

### **NEU 382E. Epigenetics.**

Same as Biology 382E. Study of how epigenetic modifications are covalent modifications of DNA or histones that cause changes in gene expression and how epigenetic modifications appear to be a method through which nurture or the environment can influence nature. Emphasis on how experience or environmental factors epigenetically modify health or behavior of animals. Three lecture hours a week for one semester. Only one of the following may be counted: Biology 381K (Topic: Epigenetics), 382E, Neuroscience 382E. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

### **NEU 482T. Principles of Neuroscience I.**

Examines the core material on essential topics in neuroscience from the molecular to the systems and behavioral levels. Four lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

### **NEU 383C. Functional Neuroanatomy.**

An examination of the anatomy of the brain and spinal cord, emphasizing connections and functions of neural systems. Three lecture hours a week for one semester. Neuroscience 383C and Psychology 383C may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **NEU 383D. Neuropharmacology.**

An advanced survey of neurotransmitters and systems in the brain. Emphasis is on pharmacological analysis at the molecular level to determine mechanisms of action of drugs that act on the brain. Three lecture hours a week for one semester. Only one of the following may be counted: Neuroscience 383D, Pharmacy 383D, Pharmacy Graduate Studies 383D. Prerequisite: Graduate standing and consent of instructor.

### **NEU 383M. Data Analysis and Statistics for the Neurosciences.**

Statistical applications relevant to areas of research in neuroscience. Three lecture hours a week for one semester. Prerequisite: Graduate standing, an undergraduate statistics course, and consent of instructor.

### **NEU 383T. Principles of Neuroscience II.**

Review and discussion of research in all fields of neuroscience, including molecular, cellular, behavioral, and systems. Examines important early studies and contemporary work. Three lecture hours a week for one semester. Neuroscience 383T and Psychology 383T may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **NEU 384C. Bootstrap Statistics.**

Same as Psychology 384C. An introduction to modern methods of statistical analysis based on numerical computer simulation. Covers a range of common data analysis situations drawn mainly from the fields of neuroscience and experimental psychology. Techniques include point estimation, two-group and multiple group experiments, regression and curve fitting, and Bayesian analysis. Three lecture hours a week for one semester. Only one of the following may be counted: Neuroscience

384C, 385L (Topic: Bootstrap Statistics), Psychology 384C, 394U (Topic: Bootstrap Statistics). Prerequisite: Graduate standing, an undergraduate statistics course, and consent of instructor.

### **NEU 384M. Advanced Statistics: Inferential.**

Same as Psychology 384M. Covers t-test, chi-square, analysis of variance, and nonparametric tests. Three lecture hours a week for one semester. Prerequisite: Graduate standing, an undergraduate statistics course, and consent of instructor.

### **NEU 185D. Responsible Conduct of Science.**

Ethical considerations in the conduct of science, including issues of animal welfare, data analysis, fraud, publications, misconduct, intellectual property, grants, peer review, and mentor responsibility. One lecture hour a week for one semester. Only one of the following may be counted: Neuroscience 185D, Pharmacy 185D, Pharmacy Graduate Studies 185D. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **NEU 185L, 285L, 385L, 485L. Topics in Neuroscience.**

For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. Additional laboratory hours may vary with the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; twelve semester hours of upper-division coursework in biology; and consent of instructor.

**Topic 3: Addiction Biology.** Current research in addiction biology. Students present individual research papers and reports. Three lecture hours a week for one semester. Biology 381K (Topic 8: Addiction Biology) and Neuroscience 385L (Topic 3) may not both be counted.

**Topic 5: Behavioral Neuroendocrinology.** Current research in neuroendocrinology, including action of neuroendocrine systems on behavior, assays of substances in the blood to identify gene products, and examination of stress from neuroendocrine, behavioral, health, and immunity perspectives. Three lecture hours a week for one semester. Only one of the following may be counted: Neuroscience 385L (Topic 5), 394P (Topic: Behavioral Neuroendocrinology), Psychology 394P (Topic 17), 394P (Topic: Behavioral Neuroendocrinology).

**Topic 6: Foundations of Human Neuroimaging.** A survey of the foundations for neuroimaging research with a focus on cognitive neuroscience. Describes the physical methods of image acquisition and physiological mechanisms used for functional imaging. Emphasis on magnetic resonance methods for structural and functional imaging. Surveys other imaging modalities, including positron emission tomography (PET), optical, and EEG/MEG electrical source localization. Only one of the following may be counted: Biology 381K (Topic: Foundations of Neuroimaging), Neuroscience 385L (Topic 6), 394P (Topic: Foundations of Magnetic Resonance Imaging Research), Psychology 394P (Topic: Foundations of Magnetic Resonance Imaging Research), 394P (Topic 13).

**Topic 7: Topics in Vision and Hearing.** Current research in human vision and hearing. Three lecture hours a week for one semester. Neuroscience 385L (Topic 7) and Psychology 394U (Topic 8: Topics in Vision and Hearing) may not both be counted.

**Topic 8: Ion Channels and Neuronal Signaling.** Molecular properties of ion channels and the mechanisms of electrical signaling in neurons and other excitable cells. Three lecture hours a week for one semester.

**Topic 9: Synaptic Physiology and Plasticity in the Central Nervous System.** Detailed background in the physiology and plasticity of synaptic transmission in the mammalian central nervous system. Three lecture hours a week for one semester.

**Topic 12: Quantifying Brain Structure.** Concepts and hands-on applications for quantifying aspects of brain and cellular structure, with a focus on stereological approaches. Three lecture hours a week for one semester. Only one of the following may be counted:

Neuroscience 385L (Topic 12), 394P (Topic: Quantitative Methods for Brain Structure), Psychology 394P (Topic 16: Quantifying Brain Structure), 394P (Topic: Quantitative Methods for Brain Structure).  
**Topic 13: Neurobiology of Disease.** Examines the neurobiological basis of disorders of the brain, with a focus on mental illness. Emphasis on the neural circuitries and neurochemical events that underlie specific mental processes and behaviors. Neuroscience 385L (Topic: Neurobiology of Disease) and Neuroscience 385L (Topic 13) may not both be counted.

#### **NEU 386G, 486G. Functional and Synaptic Neuroanatomy.**

Neuroanatomy and functional connectivity as a basis for brain function and behavior examined from gross structure, cytology and nanoscale synaptic connectivity. Subjects includes somatosensory, motor, visual, auditory, olfactory, taste, limbic, vestibular, hypothalamus, and other systems in addition to the synaptic basis of learning and memory, fear, sleep, stress, and synaptic changes during development, aging, mental retardation, and neurological diseases. Laboratory projects include three-dimensional reconstructions from serial section electron microscopy. For Neuroscience 386G, two lecture hours and one and one half laboratory hours a week for one semester; for Neuroscience 486G, three lecture hours and one and one half laboratory hours a week for one semester. Only one of the following may be counted: Neuroscience 385L (Topic 10), 386G, 486G. Prerequisite: Graduate standing and principles of neuroscience, vertebrate physiology, or other introductory neuroscience course; or consent of instructor.

#### **NEU 190, 290, 390. Research.**

The equivalent of one, two, or three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and fifteen semester hours of coursework in neuroscience; students must contact the Neuroscience Graduate Studies Office before registering.

#### **NEU 191. Graduate Seminar in Neuroscience.**

Presentations and discussions of research topics in neuroscience. One lecture hour a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

#### **NEU 391N. Learning and Memory.**

Same as Psychology 391N. Presentation of contemporary approaches to the study of conditioning and learning at the behavioral level. Focuses on empirical data and theoretical analysis of acquisition and performance in Pavlovian and instrumental conditioning. Includes discussion of habituation, sensitization, stimulus control, and other paradigms for studying cognitive processes in nonverbal organisms. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **NEU 394P. Seminars in Neuroscience.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Current Topics in Behavioral Neuroscience.** Brain-behavior relationships, particularly recent research in behavioral neuroscience, including the anatomical and neurochemical mechanisms of behavioral events, and behavioral influences on the brain. Neuroscience 394P (Topic 1) and Psychology 394P (Topic 1: Current Topics in Behavioral Neuroscience) may not both be counted. Offered on the credit/no credit basis only.

**Topic 3: Neurobiology of Learning and Memory.** Neuroanatomical systems that are functionally related to basic forms of learning and memory in mammals. Neuroscience 394P (Topic 3) and Psychology 394P (Topic 3: Neurobiology of Learning and Memory) may not both be counted.

**Topic 4: Advanced Topics in Neuroanatomy.** Neuroanatomical systems and function across species. Basic forms of neuroanatomy in mammals. Neuroscience 394P (Topic 4) and Psychology 394P (Topic 7: Advanced Topics in Neuroanatomy) may not both be counted.

**Topic 7: Analysis of Functional Magnetic Resonance Imaging Data.** Functional magnetic resonance imaging experimental design and analysis. Neuroscience 394P (Topic 7) and Psychology 394P (Topic 14: Analysis of Functional Magnetic Resonance Imaging Data) may not both be counted. Additional prerequisite: Basic knowledge of functional neuroanatomy.

**Topic 8: Topics in Systems Neuroscience.** Focuses on one or two topics and examines them in depth through group discussions of key scientific manuscripts. Discusses both classical studies and contemporary research. Only one of the following may be counted: Neuroscience 394P (Topic 8), Psychology 394U (Topic 14: Topics in Systems Neuroscience), 394U (Topic: Advanced Topics in Systems Neuroscience).

**Topic 9: Perception and Action.** Current topics in visually guided behavior, including eye movements, attention, and motor control, from behavioral, computational, and neurophysiological approaches. Neuroscience 394P (Topic 9) and Psychology 394U (Topic 16: Perception and Action) may not both be counted.

**Topic 10: Statistical Methods in Computational Neuroscience.** Same as Psychology 394U (Topic 19: Statistical Methods in Computational Neuroscience). Introduction to statistical and computational methods for understanding information processing in the nervous system, with emphasis on neural coding and statistical modeling of neural responses. Three class hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

#### **NEU 396D. Clinical Psychopharmacology.**

Same as Psychology 396D. Recent findings concerning the mechanisms of action and the behavioral effects of psychoactive drugs, particularly those used in psychiatry. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### **NEU 698. Thesis.**

The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in neuroscience and consent of the graduate adviser; for 698B, Neuroscience 698A.

#### **NEU 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

#### **NEU 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Neuroscience 399R, 699R, or 999R.

## **Nutritional Sciences**

*Master of Arts  
Doctor of Philosophy*

### **For More Information**

**Campus address:** T. S. Painter Hall (PAI) 4.36B, phone (512) 471-0337, fax (512) 471-5844; campus mail code: A2703

**Mailing address:** The University of Texas at Austin, Graduate Program in Nutritional Sciences, Department of Nutritional Sciences, 200 W 24th Street Stop A2703, Austin TX 78712

**E-mail:** hegrad@uts.cc.utexas.edu

**URL:** <http://www.he.utexas.edu/ntr/graduate-program>

## Facilities for Graduate Work

Facilities for research and graduate instruction in nutritional sciences include modern laboratories for biochemical, immunological, and cellular/molecular biological techniques such as cell and tissue culture, immunological assays, cytokine bioassays, radioisotope analyses, stable isotope analyses, and protein structure and function determination.

Facilities are also available for analysis of vitamins, amino acids, minerals, lipids, carbohydrates, and other substances of nutritional and physiological importance. Local, state, and federal health, child-care, and geriatrics programs provide research and clinical settings. Other resources are the Life Science Library, the Mallet Chemistry Library, the Perry-Castañeda Library, the Animal Resources Center, and Information Technology Services. Graduate students have access to the Student Microcomputer Facility and to statistical applications maintained by the Department of Nutritional Sciences.

## Programs of Study

The graduate program has biochemical, molecular-biological, and clinical components and includes study in the following areas: molecular and cellular aspects of nutrient function; molecular and cellular approaches to the study of nutrition and disease; nutritional biochemistry; behavioral and child nutrition; nutrient requirements and intakes and health assessment; nutrition and cancer, obesity, aging, and immunity; and nutrition education.

The master's degree program is designed to prepare individuals for teaching in community colleges; administration in public health programs; technical positions at food, pharmaceutical, and chemical laboratories; and, for those who are registered dietitians, advanced practitioner and teaching positions in clinical dietetics. Students may also apply to the Coordinated Program in Dietetics, which provides courses and experience that will meet the requirements for registration eligibility of the Commission on Dietetic Registration of the American Dietetic Association.

The doctoral degree program is designed to prepare students for research, teaching, and administrative positions in colleges, universities, government, and industry. Competence in related fields is emphasized, and supporting work is selected from areas such as biochemistry, biology, molecular biology, computer science, genetics, communication, geriatrics, immunology, physiology, kinesiology, psychology, or health promotion.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Molly S Bray	Michele Forman
Margaret E Briley	Jeanne H Freeland-Graves
Jaimie N Davis	Christopher A Jolly
Linda A Degraffenried	Bob G Sanders
John Digiovanni	Stefano Tiziani
Richard H Finnell	Bugao Xu

## Admission and Degree Requirements

The preliminary training of students seeking a graduate degree should include courses in the following fields: inorganic chemistry with laboratory, organic chemistry with laboratory, biochemistry with laboratory, vertebrate or human physiology, cellular and molecular biology, statistics, and

nutrition. The Graduate Studies Committee may recommend that some or all of these courses be completed as a prerequisite for admission to the program or in addition to the courses required for the graduate degree. For students who wish to combine the advanced degree with courses and experiences meeting the requirements for registration eligibility with the American Dietetic Association, additional courses may be required.

A handbook available from the graduate coordinator gives details of policies, procedures, and requirements.

## Master of Arts

The Graduate Studies Committee must approve the Program of Work before the student is admitted to candidacy for the master's degree. Thirty semester hours are required, distributed as follows: (1) eighteen hours in specified nutrition courses; (2) six hours in a minor or supporting field such as biology, anthropology, biochemistry, immunology, educational psychology, curriculum and instruction, health education, public health, pharmacology, or kinesiology; and (3) six hours in the thesis course, involving an original research project. The eighteen hours in nutrition must include at least three hours in research methods, at least three in research problems, at least three in seminar, and at least six in recent advances; the remaining three hours may be in either research methods or recent advances.

A degree program with report is also available, for students seeking a terminal master's degree. In this program, Nutrition 398R and three additional hours in either research methods or recent advances replace the thesis course.

## Doctor of Philosophy

The doctoral program typically requires four to five years of full-time study. Students are expected to meet the following requirements for admission to candidacy by the end of the second year: (1) completion of courses conditional to admission; (2) eighteen semester hours in nutrition, including the following courses with a grade of at least *B* in each: Nutrition 390 (Topic 1: *Advances in Nutritional Sciences I*), 390 (Topic 6: *Molecular Nutritional Sciences*), 390 (Topic 7: *Advances in Nutritional Sciences II*), and 394 (Topic 1: *General Nutrition*); (3) six hours of graduate coursework outside nutrition in fields germane to the dissertation research, such as biology, biochemistry, molecular biology, educational psychology, curriculum and instruction, health education, and kinesiology; (4) presentation and defense of a dissertation research proposal and satisfactory response to questions on nutrition and related sciences; and (5) approval by the Graduate Studies Committee of the proposed course plan and proposed dissertation research program. Further supporting work in nutrition or related sciences is usually needed to augment the program. All doctoral candidates must write a dissertation based on the results of their original research and must make a formal oral defense of the dissertation. The Graduate Studies Committee must certify that all of the degree requirements have been completed.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.



## Nutrition: NTR

### NTR 380K. Research Methods in Nutritional Sciences.

One lecture hour and six laboratory hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in nutrition, or graduate standing and consent of instructor.

**Topic 1: Experimental Nutrition.**

**Topic 2: Nutritional Immunology.**

**Topic 3: Experimental Design and Statistics.**

**Topic 4: Advanced Experimental Design and Statistics.** Additional prerequisite: Nutrition 380K (Topic 3) or consent of instructor.

**Topic 5: Carcinogenesis.**

**Topic 6: Nutritional Biochemistry.**

### NTR 390. Recent Advances in Nutritional Sciences.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; and one of the following: Chemistry 339K and 339L, Chemistry 369, equivalent coursework, or consent of instructor.

**Topic 1: Advances in Nutritional Sciences I.** Required of all graduate students in nutrition.

**Topic 2: Carbohydrates and Fiber.**

**Topic 3: Lipids.**

**Topic 4: Vitamins and Minerals.**

**Topic 5: Minerals.**

**Topic 6: Molecular Nutritional Sciences.**

**Topic 7: Advances in Nutritional Sciences II.** Required of all graduate students in nutrition.

**Topic 8: Clinical Nutrition.** Additional prerequisite: Nutrition 370 or the equivalent or consent of instructor.

**Topic 9: Nutrition, Immunology, and Cancer.**

**Topic 10: Geriatric Nutrition and Metabolism.** Study of how aging influences nutrient requirements and metabolism at the biochemical and molecular level. Discussion of dietary changes to offset the effects of aging and to improve quality of life.

**Topic 11: Nutrition, Cancer, and Development.** The role of nutrition in development from embryo to adult, the role of nutrition in the prevention and treatment of cancer, and the ability of nutrients to affect development and disease.

### NTR 392. Research Problems in Nutritional Sciences.

One lecture hour and six laboratory hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Biochemical Nutrition.**

**Topic 2: Nutrient Requirements.**

**Topic 3: Nutrition and Cancer.**

**Topic 4: Nutrition and Immunology.**

**Topic 5: Food Sciences.**

**Topic 6: Clinical Nutrition.**

**Topic 7: Nutrition Education.**

**Topic 8: Developmental Nutrition.**

**Topic 9: Foodservice Systems.**

**Topic 10: Nutrition and Metabolism.**

**Topic 11: Obesity.**

### NTR 194, 294, 394. Graduate Seminar in Nutritional Sciences.

One, two, or three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: General Nutrition.** Required of all students.

**Topic 2: Clinical Nutrition.**

**Topic 3: Molecular and Cellular Nutrition.**

**Topic 4: Nutrition, Immunology, and Disease.**

**Topic 5: Nutrition through the Life Cycle.**

### NTR 397C, 697C. Conference Course in Nutritional Sciences.

For 397C, one lecture hour and six laboratory hours a week for one semester; for 697C, two lecture hours and twelve laboratory hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### NTR 698. Thesis.

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in nutrition and consent of the graduate adviser; for 698B, Nutrition 698A.

### NTR 398R. Master's Report.

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in nutrition and consent of the supervising professor.

### NTR 398T. Supervised Teaching in Nutrition.

Teaching under close supervision; group meetings, individual conferences, and reports. Three lecture hours a week for one semester. Prerequisite: Graduate standing and appointment as a teaching assistant.

### NTR 399R, 699R, 999R. Dissertation.

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### NTR 399W, 699W, 999W. Dissertation.

Offered on the credit/no credit basis only. Prerequisite: Nutrition 399R, 699R, or 999R.

## Physics

*Master of Arts  
Master of Science in Applied Physics  
Doctor of Philosophy*

## For More Information

**Campus address:** Robert Lee Moore Hall (RLM) 5.224, phone (512) 471-1664, fax (512) 471-9637; campus mail code: C1600

**Mailing address:** The University of Texas at Austin, Graduate Program, Department of Physics, 2515 Speedway Stop C1600, Austin TX 78712

**E-mail:** [graduate@physics.utexas.edu](mailto:graduate@physics.utexas.edu)

**URL:** <http://www.ph.utexas.edu/>

## Facilities for Graduate Work

Modern facilities for graduate study and research include a large-scale cryogenic laboratory; synthesis and strong magnetic field equipment; nuclear magnetic and electron paramagnetic resonance laboratories; extensive facilities for tunneling and force microscopy and nanostructure characterization, SQUID magnetometry, and electron spectroscopy; well-equipped laboratories in optical spectroscopy, quantum optics, femtosecond spectroscopy and diagnostics, electron-atom and surface scattering and high-intensity laser science; and facilities for turbulent flow and nonlinear dynamics experiments. Plasma physics experiments are conducted at the major national tokamaks in Boston and San Diego. Experiments in high-energy heavy ion nuclear and particle physics are

conducted at large accelerator facilities such as Brookhaven National Laboratory (New York), Fermi National Accelerator Laboratory (Illinois), and Stanford Linear Accelerator Center (California). Theoretical work in plasma physics, condensed matter physics, acoustics, nonlinear dynamics, relativity, astrophysics, statistical mechanics, and particle theory is conducted within the Department of Physics. Students have access to excellent computer and library facilities. The department maintains and staffs a machine shop, student workshop, low-temperature and high-vacuum shop, and electronics design and fabrication shop.

## Areas of Study

The Department of Physics has active research groups in nine main areas of current physics research: atomic, molecular, and optical physics; classical physics; nuclear physics; statistical and thermal physics; plasma physics; condensed matter physics; nonlinear dynamics; relativity and cosmology; and elementary particle physics. In most of these fields both experimental and theoretical work is in progress.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Sanjay K Banerjee	Karol Lang
Herbert L Berk	Xiaoqin E Li
Arno R Bohm	Allan H Macdonald
Boris Breizman	Swadesh M Mahajan
James R Chelikowsky	Michael P Marder
Charles B Chiu	Hans M Mark
William R Coker	Christina Markert
Alejandro L De Lozanne	John T Markert
Alexander A Demkov	Richard A Matzner
Duane A Dicus	Milos Milosavljevic
Jacques Distler	Tessie J Moon
Todd Ditmire	Philip J Morrison
Michael W Downer	Andrew M Neitzke
James L Erskine	Qian Niu
Gregory A Fiete	Peter Onyisi
Manfred Fink	Raymond Lee Orbach
Willy Fischler	Sonia Paban
Richard Fitzpatrick	Charles L Radin
Ernst-Ludwig Florin	Mark G Raizen
Daniel S Freed	Linda E Reichl
Kenneth W Gentle	Jack L Ritchie
Austin M Gleeson	Roy F Schwitters
John B Goodenough	Paul R Shapiro
Vernita Gordon	Chih-Kang Shih
Mark F Hamilton	Gennady Shvets
Richard D Hazeltine	Greg O Sitz
Bjorn Hegelich	George Sudarshan
Daniel J Heinzen	Harry L Swinney
Paul S Ho	Maxim Tsai
Gerald W Hoffmann	Jack S Turner
Vadim Kaplunovsky	James W Vick
John W Keto	Francois Waelbroeck
Can Kilic	Steven Weinberg
Hans A Koch	John C Wheeler
Keji Lai	Zhen Yao
Sheldon Landsberger	

## Degree Requirements

It is assumed that the student has an undergraduate background that includes mechanics, electricity and magnetism, statistical mechanics and thermodynamics, atomic physics, and quantum mechanics.

### Master of Arts

The Master of Arts is not a part of the qualifying process for the doctoral degree. First-year students plan the first semester registration with the graduate adviser in physics. Students are encouraged to investigate all research groups in the department before selecting a professor to supervise a thesis project. The degree plan is then designed by the student, the supervising professor, and the graduate adviser. The time involved for completing a master's degree is related to the quality of the student's undergraduate background: the average time for completion by students with a good undergraduate background is one calendar year and one semester.

### Master of Science in Applied Physics

This degree program is designed to provide students with a broad background in physics and related fields, with an emphasis on those aspects of the science most used in an industrial setting. The required physics courses include Physics 380N, 386K, 386N, 387K, and 389K; Physics 385K, *Classical Mechanics*, may be taken as an optional course. The supporting work must be in engineering, chemistry, or geological sciences. A thesis is also required.

### Doctor of Philosophy

To be admitted to candidacy for the doctoral degree, the student must (1) fulfill the core course requirement described below; (2) show evidence of exposure to modern methods of experimental physics; this exposure may be gained in a senior-level laboratory course taken by the student as an undergraduate and approved by the graduate adviser and the chair of the Graduate Studies Committee, by previous participation in an experimental program, or in Physics 380N; and (3) fulfill the oral examination requirement described below.

**Core courses.** During the first two years of graduate study, the student must take four core courses: Physics 385K, 385L, 387K or 387L, and 389K or 389L. The student must earn an official grade of at least B- in each course and a grade point average of at least 3.33 in the four courses. The student may ask for the grade he or she earns in Physics 380N to be substituted for the grade in one of the core courses when the average is computed. A well-prepared student may seek to fulfill the core course requirement by earning satisfactory grades on the final examinations for some of these courses rather than by registering for them; in this case, the student does not receive graduate credit for these courses and the grade is not counted toward the required average.

**The oral qualifying examination.** After satisfying the first two requirements above, and within twenty-seven months of entering the program, the student must take an oral qualifying examination. The examination consists of a presentation before a committee of four physics faculty members, one of whom is a member of the Graduate Studies Subcommittee. The presentation is open to all interested parties. It is followed by a question period restricted to the student and the committee. The questions during this session are directed toward clarifying the presentation and helping the committee determine whether the student has a solid grasp of the basic material needed for research in his or her specialization. The student passes the examination by obtaining a positive vote from at least three of the four faculty members on the oral qualifying committee.

Each Program of Work for the doctoral degree must include at least four advanced courses in physics; a list of acceptable courses is maintained by the Graduate Studies Subcommittee. The program must also include three courses outside the student's area of specialization. One of these must be an advanced physics course; another must be outside the Department of Physics; the third may be either an advanced physics course or a course outside the Department of Physics. A dissertation is required of every candidate, followed by a final oral examination covering the dissertation and the general field of the dissertation.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Physics: PHY

#### PHY 380L. Plasma Physics I.

Particle drifts, equations for plasmas, magnetohydrodynamics, waves and instabilities in the two-fluid model, Vlasov equation, Landau damping, controlled thermonuclear research, plasma diagnostics. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### PHY 380M. Plasma Physics II.

Plasma containment, stability theory in fluid models, derivation of Vlasov and Fokker-Planck equations, the dielectric tensor, velocity space and gradient instabilities, Nyquist diagrams. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Physics 380L or consent of instructor.

#### PHY 380N. Experimental Physics.

Experimental work to provide exposure to physics research techniques. Eighteen laboratory hours a week for one semester. Prerequisite: Graduate standing and concurrent enrollment in Physics 390.

#### PHY 380T. Advanced Study in Physics.

Not open to physics majors. Special topics for physics teachers. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, a bachelor's degree in science or mathematics, and consent of the graduate adviser.

#### PHY 381C. Computational Physics.

Dynamical and static descriptions and solutions of many-body, nonlinear physical systems by computation. Theory of computation and applications to various branches of physics. Three lecture hours a week for one semester. Computational and Applied Mathematics 381C and Physics 381C may not both be counted. Prerequisite: Graduate standing; and Physics 385K and 387K, or consent of instructor.

#### PHY 381M. Methods of Mathematical Physics I.

Same as Computational Science, Engineering, and Mathematics 385M. Theory of analytic functions; linear algebra and vector spaces; orthogonal functions; ordinary differential equations; partial differential equations; Green's functions; complex variables. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 381M, Computational Science, Engineering, and Mathematics 385M, Physics 381M. Prerequisite: Graduate standing.

#### PHY 381N. Methods of Mathematical Physics II.

Same as Computational Science, Engineering, and Mathematics 385N. Continuation of Computational Science, Engineering, and Mathematics 385M and Physics 381M. Topology, functional analysis, approximation methods, group theory, differential manifolds. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 381N, Computational Science, Engineering, and Mathematics 385N, Physics 381N. Prerequisite: Graduate standing; and Computational Science, Engineering, and Mathematics 385M (or Computational and Applied Mathematics 381M) or Physics 381M.

#### PHY 382M. Fluid Mechanics.

Flow of ideal and viscous fluids; introduction to turbulence; boundary layers; sound and shock waves. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Physics 381M, 385K, and 387K.

#### PHY 382N. Nonlinear Dynamics.

Basic concepts of evolution and stability, examples of instabilities, low dimensional dynamical systems, chaos, characterization of temporal chaos, pattern formation, Hamiltonian systems. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### PHY 382P. Biophysics I.

The cell, small molecules and chemical kinetics, forces on the molecular scale, proteins, lipids and membranes, biopolymers, neurons and electrical signal transduction, and complex pattern formation in cells and cell aggregates. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### PHY 382Q. Biophysics II.

Advanced biophysics with emphasis on biologically relevant questions addressed with physical approaches. Biopolymer mechanics, protein-nucleic acid interaction, protein structure and dynamics, membrane dynamics, cytoskeletal dynamics, motor proteins, cell shape and motility, cell communication, tissue mechanics. Three lecture hours a week for one semester. Prerequisite: Graduate standing; and Physics 382P or consent of instructor.

#### PHY 382S. Seminar in Nonlinear Dynamics.

Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

#### PHY 385K. Classical Mechanics.

Classical and relativistic Hamiltonian mechanics; Hamilton-Jacobi theory; Lagrangian mechanics for continuous media; symmetry principles and conservation laws. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### PHY 385L. Statistical Mechanics.

Equilibrium statistical mechanics; introduction to nonequilibrium concepts; ensembles; classical and quantum gases; statistical physics of solids. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Physics 385K or consent of instructor.

#### PHY 385S. Seminar in Statistical Physics.

Topics to be announced. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**PHY 385T. Special Topics in Statistical Physics.**

Topics to be announced. Three lecture hours a week for one semester. With consent of the graduate adviser, may be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

**PHY 386K. Physics of Sensors.**

Physical principles of acoustic, optical, electromagnetic, radiation, and motion sensors. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

**PHY 386N. Technical Seminar.**

Physics for applied and industrial purposes. Three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of the graduate adviser.

**PHY 386S. Seminar in Applied Physics.**

Topics to be announced. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**PHY 387K. Electromagnetic Theory I.**

Electrostatics and magnetostatics; boundary value problems; Maxwell's equations; plane waves; wave guides; diffraction; multipole radiation. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**PHY 387L. Electromagnetic Theory II.**

Magnetohydrodynamics and plasmas; relativity; collisions of charged particles; radiation from moving charges; radiation damping. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Physics 387K.

**PHY 387M. Relativity Theory I.**

Tensor calculus; Riemannian geometry; geometry of Minkowski space-time; special relativity theory. Three lecture hours a week for one semester. Offered in the fall semester only. Prerequisite: Graduate standing and Physics 387K.

**PHY 387N. Relativity Theory II.**

General relativity theory; gravitational field equations; weak field approximations; Schwarzschild solution, observable consequences; other topics. Three lecture hours a week for one semester. Offered in the spring semester only. Prerequisite: Graduate standing and Physics 387M.

**PHY 388M. Graduate Colloquy.**

Reviews of current topics in physics research. Three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

**PHY 388S. Seminar in Teaching Physics.**

Topics to be announced. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**PHY 389K. Quantum Mechanics I.**

Hilbert space and operators; Schroedinger and Heisenberg equations; solutions for systems in one and three dimensions; theory of spin and orbital angular momentum; the effect of symmetries; approximation techniques; elementary scattering theory. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**PHY 389L. Quantum Mechanics II.**

Perturbation techniques; systems of identical particles; quantum theory of radiation; emission and absorption of photons; selection rules; life times; scattering theory for light and particles, S-matrix; relativistic corrections

to electron motion. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Physics 389K.

**PHY 190, 290, 390, 690. Graduate Research.**

For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. May not be counted toward the master's degree in physics. Prerequisite: Graduate standing, and written consent of instructor filed with the graduate adviser.

**PHY 391M. Nonlinear Plasma Theory.**

Quasi-linear theory, weak turbulence, large amplitude waves, plasma radiation, shock waves, shock structure, computer techniques. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Physics 380L.

**PHY 391S. Seminar in Plasma Physics.**

Topics to be announced. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**PHY 391T. Special Subjects in Plasma Physics.**

Subjects to be announced. Three lecture hours a week for one semester. With consent of instructor, may be repeated for credit. Prerequisite: Graduate standing, Physics 380L, and consent of instructor.

**PHY 391U. Seminar in Plasma Theory.**

Current topics in plasma theory. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**PHY 392K. Solid-State Physics I.**

Lattice vibrations and thermal properties of solids; band theory of solids; transport properties of metals and semiconductors; optical properties; magnetic properties; magnetic relaxation; superconductivity. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Physics 389K, and Physics 375S or the equivalent.

**PHY 392L. Solid-State Physics II.**

Elementary excitations: phonons, electrons, spin waves; interactions: phonon-phonon, electron-electron, electron-phonon; theory of metals and semiconductors; transport theory; optical properties. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Physics 392K.

**PHY 392N. Many-Body Theory.**

Overview of many-body theory; second quantization; Green's functions and Feynman diagrams; finite-temperature, imaginary-time Green's functions; the disordered metal; path integrals; broken symmetries; and local moments. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

**PHY 392S. Seminar in Solid-State Physics.**

Topics to be announced. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**PHY 392T. Special Topics in Solid-State Physics.**

Topics to be announced. Three lecture hours a week for one semester. With consent of instructor, may be repeated for credit. Prerequisite: Graduate standing, Physics 392K, and consent of instructor.

**PHY 393S. Seminar in Relativity.**

Topics to be announced. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**PHY 393T. Special Topics in Relativity.**

Topics to be announced. Three lecture hours a week for one semester. With consent of instructor, may be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

**PHY 394U. Special Topics in Theoretical Physics.**

Topics to be announced. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**PHY 395. Survey of Atomic and Molecular Physics.**

Spectra of atoms and diatomic molecules; quantum electronics; experimental techniques. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**PHY 395K. Nonlinear Optics and Lasers.**

Gaussian beam optics, interaction of electromagnetic radiation with matter, semiclassical laser theory, experimental laser systems, nonlinear optical susceptibilities, harmonic generation, wave mixing, electro-optic and acousto-optic effects, coherent transient effects, optical breakdown, laser-plasma interactions. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and either Physics 387K and 389K or consent of instructor.

**PHY 395M. Laser Physics.**

Continuation of Physics 395K. Advanced atomic physics of various laser systems, optical coherence and diffraction theory, pulse propagation and dispersion effects, advanced laser oscillator and amplifier physics, laser amplifier chain design, and chirped-pulse amplification. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Physics 387K, 389K, and 395K, and consent of instructor.

**PHY 395S. Seminar in Atomic and Molecular Physics.**

Topics to be announced. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**PHY 395T. Special Topics in Atomic and Molecular Physics.**

Topics to be announced. Three lecture hours a week for one semester. With consent of instructor, may be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

**PHY 396J. Introduction to Elementary Particle Physics.**

Historical introduction to elementary particles, elementary particle dynamics, relativistic kinematics, symmetries, bound states, the Feynman calculus, quantum electrodynamics, electrodynamics of quarks and hadrons, quantum chromodynamics, weak interactions, gauge theories. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Physics 389K, and knowledge of special relativity and scattering.

**PHY 396K. Quantum Field Theory I.**

Quantization of the Klein-Gordon, Dirac, and electromagnetic field theories; theory of interacting fields, perturbation theory, and renormalization. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Physics 389K.

**PHY 396L. Quantum Field Theory II.**

Path-integral formalism, massless particles, electrodynamics, nonperturbative methods, one-loop calculations in quantum electrodynamics, general renormalization theory, soft photons, bound states in quantum electrodynamics. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Physics 396K.

**PHY 396P. String Theory I.**

Introduction to string theory and conformal field theory. The free string, conformal invariance and conformal field theory, supersymmetry and string interactions. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Physics 396K or the equivalent or consent of instructor.

**PHY 396Q. String Theory II.**

Advanced conformal field theory, perturbative string theory and compactification. Introduction to nonperturbative aspects of string theory. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Physics 396P.

**PHY 396S. Seminar in Particle Physics.**

Topics to be announced. Three lecture hours a week for one semester. With consent of instructor, any topic may be repeated for credit. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**PHY 396T. Special Topics in Particle Physics.**

Topics to be announced. Three lecture hours a week for one semester. With consent of instructor, may be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

**PHY 396U. Theory Group Seminar.**

Seminars in theoretical physics. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**PHY 397K. Nuclear Physics.**

Systematics of stable nuclei; nuclear structure; decay of the nucleus; cross sections and reaction mechanisms; the elementary particles. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and Physics 389K or consent of instructor.

**PHY 397S. Seminar in Nuclear Physics.**

Topics to be announced. Three lecture hours a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

**PHY 397T. Special Topics in Nuclear Physics.**

Topics to be announced. Three lecture hours a week for one semester. With consent of instructor, may be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

**PHY 197U. Graduate Seminar in Nanoscience.**

Various seminar topics in nanoscience. One lecture hour a week for one semester. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

**PHY 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in physics and written consent of the supervising professor filed with the graduate adviser; for 698B, Physics 698A.

## PHY 398T. Supervised Teaching in Physics.

A review of physics teaching strategies, administrative procedures, and classroom responsibilities. Includes a review and critique of each participant's classroom teaching. Three lecture hours a week for one semester. Prerequisite: Graduate standing and appointment as a teaching assistant.

## PHY 399R, 699R, 999R. Dissertation.

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and written consent of instructor filed with the graduate adviser.

## PHY 399W, 699W, 999W. Dissertation.

Offered on the credit/no credit basis only. Prerequisite: Physics 399R, 699R, or 999R; and written consent of instructor filed with the graduate adviser.

# Statistics

*Master of Science in Statistics*  
*Doctor of Philosophy*

## For More Information

**Campus address:** Gates Dell Complex (GDC) 7.504, phone (512) 232-0693, fax (512) 475-8297, campus mail code: D9800

**Mailing address:** The University of Texas at Austin, Graduate Program in Statistics, Department of Statistics and Data Sciences, 2317 Speedway Stop D9800, Austin TX 78712

**E-mail:** [vicki.keller@cns.utexas.edu](mailto:vicki.keller@cns.utexas.edu)

**URL:** <https://stat.utexas.edu/graduate>

## Facilities for Graduate Work

The Department of Statistics and Data Sciences is located in the Gates Dell Complex, which houses classrooms, faculty and administrative offices, and a statistical consulting center. The department offers campus-wide programming with the assistance of over one hundred associated faculty members in nine colleges and schools, the Population Research Center, and the Texas Advanced Computing Center. The department supports a computer lab for undergraduate and graduate courses, statistical consulting courses, a lecture series, an annual summer statistics institute, short courses on statistical software, and a graduate fellows program for students seeking consulting experience.

## Areas of Study

Graduate degree candidates are expected to develop broad competence in the discipline as a whole as well as expertise in their chosen area of concentration. The Master of Science in Statistics is a two-year program that offers advanced training for students in classical and modern statistical methods. The program is designed for students preparing for careers in statistical professions, as well as those seeking additional statistical training while pursuing a doctoral degree in another discipline. The PhD program is a four-year degree that focuses on training future researchers on theory and methods of statistics. Major emphases are placed on probability models and modern computational statistical tools. Throughout the program, students are exposed to central ideas of both Bayesian and classical approaches to inference. The program integrates the following substantive areas of application into the Program of Work: biology, computer science, economics, education, engineering, government, neuroscience, and psychology.

# Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Paul C Adams	Douglas J Morrice
Susan N Beretvas	Peter Mueller
J Eric Bickel	Marc A Musick
Patrick L Brockett	Daniel A Powers
Carlos Marinho Carvalho	William H Press
Lawrence K Cormack	Pradeep Ravikumar
Paul Damien	Brian E Roberts
Michael Daniels	Maytal Saar-Tsechansky
Inderjit S Dhillon	Thomas W Sager
Dragan Djurdjanovic	Purnamrita Sarkar
Betsy S Greenberg	Sahotra Sarkar
John J Hasenbein	James G Scott
Stephen A Jessee	Thomas S Shively
Timothy H Keitt	Chandler W Stolp
David A Kendrick	Paul Von Hippel
Lizhen Lin	Stephen G Walker
Tse-Min Lin	Claus O Wilke
John E Luecke	Sinead Williamson
Robert C Luskin	Mingyuan Zhou
Lauren A Meyers	

## Degree Requirements

Upon admission to the program, the student should demonstrate a background knowledge of mathematics and statistics equivalent to that acquired in an upper-division course in probability and statistics. Deficiencies may be made up by taking courses suggested by the graduate adviser. In most cases, these courses may not be counted toward the degree.

## Master of Science in Statistics

The master's program is offered in two tracks: track A and track B. Track A is designed for students seeking a terminal Master of Science in Statistics degree, or for students currently pursuing doctoral programs other than statistics. Track B is designed for students enrolled in the PhD in statistics program who transfer into the master's program from the PhD program. Both tracks require completion of thirty-two semester hours of approved coursework and include the completion of a master's report.

Degree requirements for both tracks are distributed as follows: (1) six core courses that provide a foundation for further study, including the following coursework with a grade of at least *B*: a two-course sequence in theoretical statistics, two courses in statistical modeling, one course in computational methods, and one course in research; (2) six hours of statistics courses chosen from an approved list; (3) six hours of supporting coursework, which may be in a subject area other than statistics but must be logically related and, together with the other degree coursework, constitute a coherent degree program; and (4) three hours of master's report, which is expected to approximate a publishable journal article in length and quality.

## Doctor of Philosophy

A doctoral student in statistics must complete a core set of courses in statistical theory and methods. At the end of the first year, students must complete a preliminary written examination covering the main concepts in these core courses. By the end of the second year, students must successfully present a plan of study and demonstrate research proficiency in an oral examination to qualify for candidacy. Students are expected

to write and defend their dissertation within two years of admission to candidacy.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

These courses are taught by department faculty and associated faculty members. Statistics and data sciences courses are open to University graduate students in any academic program. Additional information about the department's courses and its programs is available on the Department of Statistics and Data Sciences' Web site (<https://stat.utexas.edu>). Not all courses may be applied to the Master of Science in Statistics degree requirements.

### Statistics and Data Sciences: SDS

#### SDS 380C. Statistical Methods I.

Introduction to the fundamental concepts and methods of statistics. Includes descriptive statistics, sampling distributions, confidence intervals, and hypothesis testing. May include simple and multiple linear regression, analysis of variance, and categorical analysis. Use of statistical software is emphasized. Three lecture hours a week for one semester. Statistics and Data Sciences 380C and Statistics and Scientific Computation 380C may not both be counted. Prerequisite: Graduate standing.

#### SDS 380D. Statistical Methods II.

Continuation of Statistics and Data Sciences 380C (or Statistics and Scientific Computation 380C). Surveys advanced statistical modeling and may include random and mixed effects models, time series analysis, survival analysis, Bayesian methods, and multivariate analysis of variance. Use of statistical software is emphasized. Three lecture hours a week for one semester. Statistics and Data Sciences 380D and Statistics and Scientific Computation 380D may not both be counted. Prerequisite: Graduate standing, and Statistics and Data Sciences 380C (or Statistics and Scientific Computation 380C) or the equivalent.

#### SDS 381. Mathematical Methods for Statistical Analysis.

Introduction to mathematical concepts and methods essential for multivariate statistical analysis. Areas may include basic matrix algebra, eigenvalues and eigenvectors, quadratic forms, vector and matrix differentiation, unconstrained optimization, constrained optimization, and applications in multivariate statistical analysis. Three lecture hours a week for one semester. Statistics and Data Sciences 381 and Statistics and Scientific Computation 381 may not both be counted. Prerequisite: Graduate standing and a course in statistics.

#### SDS 382. Introduction to Probability and Statistics.

Expectation and variance of random variables, conditional probability and independence, sampling distributions, point estimation, confidence intervals, hypothesis tests, and other topics. Three lecture hours a week for one semester. Statistics and Data Sciences 382 and Statistics and Scientific Computation 382 may not both be counted. Prerequisite: Graduate standing and a second-semester calculus class.

#### SDS 383C. Statistical Modeling I.

An introduction to core applied statistical modeling ideas from a probabilistic, Bayesian perspective. Topics include exploratory data analysis, programming in R, Bayesian probability models, an introduction

to the Gibbs sampler, applied regression analysis, and hierarchical models. Three lecture hours a week for one semester. Statistics and Data Sciences 383C and Statistics and Scientific Computation 383C may not both be counted. Prerequisite: Graduate standing.

#### SDS 383D. Statistical Modeling II.

Use of structured, probabilistic models that incorporate multiple layers of uncertainty to describe real-world systems. Topics include multivariate normal distribution, mixture models, nonparametric Bayesian analysis, advanced hierarchical models and latent-variable models, generalized linear models, and advanced topics in linear and nonlinear regression. Three lecture hours per week for one semester. Statistics and Data Sciences 383D and Statistics and Scientific Computation 383D may not both be counted. Prerequisite: Graduate standing; Economics 392M (Topic 19), Statistics and Data Sciences 384 (or Statistics and Scientific Computation 384), or the equivalent; and 383C (or Statistics and Scientific Computation 383C).

#### SDS 183K. Data Analysis Applications.

Introduction to the use of statistical or mathematical applications for data analysis. Two lecture hours a week for eight weeks. Statistics and Data Sciences 183K and Statistics and Scientific Computation 183K may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

**Topic 1: SPSS Software.** Statistics and Data Sciences 183K (Topic 1) and Statistics and Scientific Computation 183K (Topic 1) may not both be counted. Offered on the credit/no credit basis only.

**Topic 2: SAS Software.** Statistics and Data Sciences 183K (Topic 2) and Statistics and Scientific Computation 183K (Topic 2) may not both be counted. Offered on the credit/no credit basis only.

**Topic 3: Stata Software.** Statistics and Data Sciences 183K (Topic 3) and Statistics and Scientific Computation 183K (Topic 3) may not both be counted. Offered on the credit/no credit basis only.

**Topic 4: The R Software Environment.** Statistics and Data Sciences 183K (Topic 4) and Statistics and Scientific Computation 183K (Topic 4) may not both be counted. Offered on the credit/no credit basis only.

#### SDS 384. Topics in Statistics and Probability.

Concepts of probability and mathematical statistics with applications in data analysis and research. Three lecture hours a week for one semester. Statistics and Data Sciences 384 and Statistics and Scientific Computation 384 may not both be counted unless topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; and Statistics and Data Sciences 382 (or Statistics and Scientific Computation 382), an introductory probability course and a statistics course, or consent of instructor.

**Topic 1: Applied Probability.** Basic probability theory, combinatorial analysis of random phenomena, conditional probability and independence, parametric families of distributions, expectation, distribution of functions of random variables, and limit theorems. Statistics and Data Sciences 384 (Topic 1) and Statistics and Scientific Computation 384 (Topic 1) may not both be counted.

**Topic 2: Mathematical Statistics I.** Same as Computational Science, Engineering, and Mathematics 384R and Mathematics 384C. The general theory of mathematical statistics. Includes distributions of functions of random variables, properties of a random sample, principles of data reduction, an overview of hierarchical models, decision theory, Bayesian statistics, and theoretical results relevant to point estimation, interval estimation, and hypothesis testing. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 384R, Computational Science, Engineering, and Mathematics 384R, Mathematics 384C, Statistics and Data Sciences (Topic 2), Statistics

and Scientific Computation 384 (Topic 2). Additional prerequisite: Graduate standing; and Mathematics 362K and 378K, Statistics and Scientific Computation 382, or consent of instructor.

**Topic 3: Mathematical Statistics II.** Same as Computational Science, Engineering, and Mathematics 384S and Mathematics 384D. Continuation of Computational Science, Engineering, and Mathematics 384R and Mathematics 384C. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 384S, Computational Science, Engineering, and Mathematics 384S, Mathematics 384D, Statistics and Data Sciences 384 (Topic 3), Statistics and Scientific Computation 384 (Topic 3: Mathematical Statistics II). Additional prerequisite: Graduate standing; Computational Science, Engineering, and Mathematics 384R (or Computational and Applied Mathematics 384R), Mathematics 384C, or Statistics and Scientific Computation 384 (Topic 2: Mathematical Statistics I); and Mathematics 362K and 378K, Statistics and Data Sciences 382 (or Statistics and Scientific Computation 382), or consent of instructor.

**Topic 4: Regression Analysis.** Same as Computational Science, Engineering, and Mathematics 384T and Mathematics 384G. Simple and multiple linear regression, inference in regression, prediction of new observations, diagnosis and remedial measures, transformations, and model building. Emphasis on both understanding the theory and applying theory to analyze data. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 384T, Computational Science, Engineering, and Mathematics 384T, Mathematics 384G, Statistics and Data Sciences 384 (Topic 4), Statistics and Scientific Computation 384 (Topic 4: Regression Analysis). Additional prerequisite: Graduate standing; and Mathematics 362K and 378K, Statistics and Data Sciences 382, (or Statistics and Scientific Computation 382), or consent of instructor.

**Topic 6: Design and Analysis of Experiments.** Same as Computational Science, Engineering, and Mathematics 384U and Mathematics 384E. Design and analysis of experiments, including one-way and two-way layouts; components of variance; factorial experiments; balanced incomplete block designs; crossed and nested classifications; fixed, random, and mixed models; and split plot designs. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 384U, Computational Science, Engineering, and Mathematics 384U, Mathematics 384E, Statistics and Data Sciences 384 (Topic 6), Statistics and Scientific Computation 384 (Topic 6: Design and Analysis of Experiments). Additional prerequisite: Graduate standing; and Mathematics 362K and 378K, Statistics and Data Sciences 382 (or Statistics and Scientific Computation 382), or consent of instructor.

**Topic 7: Bayesian Statistical Methods.** Fundamentals of Bayesian inference in single-parameter and multi-parameter models for inference and decision making, including simulation of posterior distributions, Markov chain Monte Carlo methods, hierarchical models, and empirical Bayes models. Statistics and Data Sciences 384 (Topic 7) and Statistics and Scientific Computation 384 (Topic 7) may not both be counted.

**Topic 8: Time Series Analysis.** Introduction to statistical time series analysis. Includes autoregressive integrated moving average (ARIMA) and more general models, forecasting, spectral analysis, time domain regression, model identification, estimation of parameters, and diagnostic checking. Statistics and Data Sciences 384 (Topic 8) and Statistics and Scientific Computation 384 (Topic 8) may not both be counted. Additional prerequisite: Mathematics 384D.

**Topic 9: Computational Statistics.** Modern, computation intensive statistical methods, including simulation, optimization methods, Monte Carlo integration, maximum likelihood estimation and expectation-maximization parameter estimation, Markov chain Monte Carlo methods, resampling methods, and nonparametric density estimation.

Statistics and Data Sciences 384 (Topic 9) and Statistics and Scientific Computation 384 (Topic 9) may not both be counted.

**Topic 10: Stochastic Processes.** Concepts and techniques of stochastic processes, with emphasis on the nature of change of variables with respect to time. Includes characterization, structural properties, and inference. Statistics and Data Sciences 384 (Topic 10) and Statistics and Scientific Computation 384 (Topic 10) may not both be counted.

### SDS 385. Topics in Applied Statistics.

Theories, models, and methods for the analysis of quantitative data. Three lecture hours a week for one semester. Statistics and Data Sciences 385 and Statistics and Scientific Computation 385 may not both be counted unless topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; and Statistics and Data Sciences 380C (or Statistics and Scientific Computation 380C), 382 (or Statistics and Scientific Computation 382), or consent of instructor.

**Topic 1: Experimental Design.** Principles, construction, and analysis of experimental designs. Includes one-way classification, randomized blocks, Latin squares, factorial and nested designs, fixed and random effects, multiple comparisons, and analysis of covariance. Statistics and Data Sciences 385 (Topic 1) and Statistics and Scientific Computation 385 (Topic 1) may not both be counted.

**Topic 2: Applied Regression.** Examination of the foundation of regression analysis. Subjects include simple and multiple linear regression, residual analysis, transformations, building models with real data, testing models, logistic regression, and panel data analysis. Statistics and Data Sciences 385 (Topic 2) and Statistics and Scientific Computation 385 (Topic 2) may not both be counted. Additional prerequisite: Graduate standing, and one of the following: Public Affairs 397, Statistics and Data Sciences 380C (or Statistics and Scientific Computation 380C), 382 (or Statistics and Scientific Computation 382), or consent of instructor.

**Topic 3: Applied Multivariate Methods.** Introduction to the analysis of multivariate data as applied to examples from the social sciences. Includes multivariate linear models, principal components and factor analysis, discriminant analysis, clustering, and canonical correlation. Statistics and Data Sciences 385 (Topic 3) and Statistics and Scientific Computation 385 (Topic 3) may not both be counted. Additional prerequisite: Statistics and Data Sciences 385 (Topic 2) (or Statistics and Scientific Computation 385 (Topic 2)), or the equivalent.

**Topic 4: Analysis of Categorical Data.** Methods for analyzing categorical data. Includes categorical explanatory variables within the general linear model, models of association among categorical variables, and models in which the response variable is categorical or is a count. Emphasis on logical similarities across methods. Statistics and Data Sciences 385 (Topic 4) and Statistics and Scientific Computation 385 (Topic 4) may not both be counted.

**Topic 5: Structural Equation Modeling.** Introduction to the basic concepts, methods, and computing tools used in structural equation modeling. Designed to help students develop a working familiarity with some common statistical procedures and their application through the use of statistical software. Statistics and Data Sciences 385 (Topic 5) and Statistics and Scientific Computation 385 (Topic 5) may not both be counted. Additional prerequisite: Statistics and Data Sciences 385 (Topic 2) (or Statistics and Scientific Computation 385 (Topic 2)), or the equivalent or consent of instructor.

**Topic 6: Hierarchical Linear Models.** Introduction to multilevel data structures, model building and testing, effect size, fixed and random effects, missing data and model assumptions, hierarchical linear modeling (HLM) logistics, statistical power, and design planning. Statistics and Data Sciences 385 (Topic 6) and Statistics and Scientific Computation 385 (Topic 6) may not both be counted. Additional prerequisite: Statistics and Data Sciences 385 (Topic 2) (or Statistics



and Scientific Computation 385 (Topic 2)), or the equivalent or consent of instructor.

**Topic 7: Survey Sampling and Methodology.** Survey planning, execution, and analysis. Includes the principles of survey research, including sampling and measurement; questionnaire construction and distribution; response effects; validity and reliability; scaling data sources; and data reduction and analysis. Statistics and Data Sciences 385 (Topic 7) and Statistics and Scientific Computation 385 (Topic 7) may not both be counted.

**Topic 8: Introduction to Bayesian Methods.** A practical introduction to Bayesian statistical inference, with an emphasis on applications in behavioral and measurement research. Examines how Bayesian statistical inference differs from classical inference in the context of simple statistical procedures and models, such as hypothesis testing, analysis of variance (ANOVA), and regression. Statistics and Data Sciences 385 (Topic 8) and Statistics and Scientific Computation 385 (Topic 8) may not both be counted. Additional prerequisite: Statistics and Data Sciences 385 (Topic 2) (or Statistics and Scientific Computation 385 (Topic 2)) or the equivalent, or consent of instructor.

**Topic 9: Longitudinal Data Analysis.** Applications of models to data collected at successive points in time. Includes latent growth curve models, models for nonlinear growth, discrete-time and continuous-time event history models, multilevel models for change, random coefficient models, and applications of models to event-occurrence data. Statistics and Data Sciences 385 (Topic 9) and Statistics and Scientific Computation 385 (Topic 9) may not both be counted.

**Topic 10: Modern Statistical Methods.** Introduction to conducting statistical analysis using modern resampling methods, including bootstrapping and Monte Carlo simulation. Emphasis on theoretical understanding and application. Statistics and Data Sciences 385 (Topic 10) and Statistics and Scientific Computation 385 (Topic 10) may not both be counted.

**Topic 11: Applied Mathematical Statistics.** Introduction to the basic concepts of probability and mathematical statistics. Includes probability distributions and estimation theory and hypothesis testing techniques. Designed for doctoral students who plan to use statistical methods in their research but do not require a highly mathematical investigation of the subject. Statistics and Data Sciences 385 (Topic 11) and Statistics and Scientific Computation 385 (Topic 11) may not both be counted. Additional prerequisite: A calculus course covering integration and differentiation.

**Topic 12: Meta-Analysis.** Introduction to the statistics used to synthesize results from a set of studies. May include calculation of different effect sizes, calculating pooled estimates using fixed and random effects models, testing moderating variables using fixed and mixed effects models, testing heterogeneity of effect sizes, and assessing and correcting publication bias. Statistics and Data Sciences 385 (Topic 12) and Statistics and Scientific Computation 385 (Topic 12) may not both be counted.

**Topic 13: Factor Analysis.** Introduction to exploratory and confirmatory factor analysis. May include review of matrix algebra and vector geometry, principal components and principal axis factoring, and factor rotation methods, as well as single-factor and multiple-factor multisample models, multitrait-multimethod technique, and latent means modeling. Emphasis on critiquing current research. Statistics and Data Sciences 385 (Topic 13) and Statistics and Scientific Computation 385 (Topic 13) may not both be counted. Additional prerequisite: Statistics and Data Sciences 385 (Topic 2) (or Statistics and Scientific Computation 385 (Topic 2)), or the equivalent or consent of instructor.

**Topic 14: Maximum-Likelihood Statistics.** Introduction to the likelihood theory of statistical inference. Includes probability distributions, estimation theory, and applications of maximum-likelihood estimation (MLE) to models with categorical or limited dependent variables, even count models, event history models, models for time-

series cross-section data, and models for hierarchical data. Statistics and Data Sciences 385 (Topic 14) and Statistics and Scientific Computation 385 (Topic 14) may not both be counted.

**Topic 15: Survival Analysis and Duration Modeling.** Focuses on the statistical methods related to the analysis of survival or of time to event data. Emphasis on practical applications in medicine, biology, economics, criminology, sociology, and engineering. May include Kaplan-Meier estimators, semiparametric and parametric regression models, model development, and model adequacy assessment. Statistics and Data Sciences 385 (Topic 15) and Statistics and Scientific Computation 385 (Topic 15) may not both be counted.

### SDS 386C. Probabilistic Graphical Models.

An introduction to statistical learning methods, exploring both the computational and statistical aspects of data analysis. Topics include numerical linear algebra, convex optimization techniques, basics of stochastic simulation, nonparametric methods, kernel methods, graphical models, decision trees, and data resampling. Three lecture hours a week for one semester. Statistics and Scientific Computation 386C and Statistics and Data Sciences 386C may not both be counted. Prerequisite: Graduate standing.

### SDS 386D. Monte Carlo Methods in Statistics.

Stochastic simulation for Bayesian inference, designed to develop an understanding of Markov chain Monte Carlo methods and their underlying theoretical framework. Topics include Markov chains, Monte Carlo integration, Gibbs sampler, Metropolis-Hastings algorithms, slice sampling, and sequential Monte Carlo. Three lecture hours a week for one semester. Statistics and Data Sciences 386D and Statistics and Scientific Computation 386D may not both be counted. Prerequisite: Graduate standing; and Economics 392M (Topic 19), Statistics and Data Sciences 384 (or Statistics and Scientific Computation 384), or the equivalent.

### SDS 387. Linear Models.

An exploration of practical applications of the projection approach to linear models, building from a review of essential linear algebra concepts to the theory of linear models from a projection-based perspective. Introduction to Bayesian ideas. Additional topics include analysis of variance, generalized linear models, and variable selection techniques. Three lecture hours a week for one semester. Statistics and Data Sciences 387 and Statistics and Scientific Computation 387 may not both be counted. Prerequisite: Graduate standing; Economics 392M (Topic 19: Probability and Statistics), Statistics and Data Sciences 384 (or Statistics and Scientific Computation 384), or the equivalent; and basic coding skills in R, Matlab, or Stata.

### SDS 388. Consulting Seminar.

Supervised experience in applying statistical or mathematical methods to real problems. Includes participation in weekly consulting sessions, directed readings in the statistical literature, the ethics of research and consulting, and report writing and presentations. The equivalent of three lecture hours a week for one semester. Statistics and Data Sciences 388 and Statistics and Scientific Computation 388 may not both be counted. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### SDS 389. Time Series and Dynamic Models.

Exploration of the general class of state-space models, or dynamic models. Emphasis is placed on the implementation and use of the models presented, with applications focused on the social sciences. Topics include dynamic regression models, the Kalman filter, time series models, multivariate time series models, conditional variance models, Markov chain Monte Carlo algorithms for state-space models, and particle filters. Three lecture hours a week for one semester. Statistics and Data Sciences 389 and Statistics and Scientific Computation 389 may not

both be counted. Prerequisite: Graduate standing; Economics 392M (Topic 19), Statistics and Data Sciences 384 (or Statistics and Scientific Computation 384), or the equivalent; and coding skills in R, Matlab, or Stata.

### **SDS 189R, 289R, 389R, 489R. Graduate Research.**

Individual research project supervised by one or more faculty members. For each semester hour of credit earned, the equivalent of one lecture hour a week for one semester. May be repeated for credit. Prerequisite: Graduate standing.

### **SDS 190. Readings in Statistics.**

Faculty directed research seminar. Activities may vary, but will include readings of cutting-edge research papers, discussion of on-going student and faculty projects, and consulting projects. May be repeated for credit. Prerequisite: Graduate standing.

### **SDS 391D. Data Mining.**

Study of various mathematical and statistical aspects of data mining. Includes supervised learning (regression, classification, and support vector machines) and unsupervised learning (clustering, principal components analysis, and dimensionality reduction). Uses technical tools drawn from linear algebra, multivariate statistics, and optimization. Three lecture hours a week for one semester. Statistics and Data Sciences 391D and Statistics and Scientific Computation 391D may not both be counted. Prerequisite: Graduate standing and a linear algebra course.

### **SDS 292, 392. Introduction to Scientific Programming.**

Introduction to programming using both the C and Fortran (95/2003) languages, with applications to basic scientific problems. Covers common data types and structures, control structures, algorithms, performance measurement, and interoperability. For each semester hour of credit earned, one lecture hour a week for one semester. Only one of the following may be counted: Statistics and Data Sciences 222, 322, 292, 392, Statistics and Scientific Computation 222, 322, 292, 392. Prerequisite: Graduate standing and credit or registration for a first-semester calculus course.

### **SDS 392M. Computational Economics.**

Introduction to the development and solution of economic models of growth, macroeconomic fluctuations, environmental economics, financial economics, general equilibrium models, game theory, and industrial economics. Includes neural nets, genetic algorithms and agent-based methods, and stochastic control theory applied to a variety of economic topics. Three lecture hours a week for one semester. Statistics and Data Sciences 392M and Statistics and Scientific Computation 392M may not both be counted. Prerequisite: Graduate standing.

### **SDS 393C. Numerical Analysis: Linear Algebra.**

Same as Computer Science 383C, Computational Science, Engineering, and Mathematics 383C, and Mathematics 383E. Survey of numerical methods in linear algebra: floating-point computation, solution of linear equations, least squares problems, algebraic eigenvalue problems. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 383C, Computational Science, Engineering, and Mathematics 383C, Computer Science 383C, Mathematics 383E, Statistics and Data Sciences 393C, Statistics and Scientific Computation 393C. Prerequisite: Graduate standing; Computer Science 367 or Mathematics 368K; and Mathematics 340L, 341, or consent of instructor.

### **SDS 393D. Numerical Analysis: Interpolation, Approximation, Quadrature, and Differential Equations.**

Same as Computer Science 383D, Computational Science, Engineering, and Mathematics 383D, and Mathematics 383F. Survey of numerical

methods for interpolation, functional approximation, integration, and solution of differential equations. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 383D, Computational Science, Engineering, and Mathematics 383D, Computer Science 383D, Mathematics 383F, Statistics and Data Sciences 393D, Statistics and Scientific Computation 393D. Prerequisite: Graduate standing; Computational Science, Engineering, and Mathematics 383C (or Computational and Applied Mathematics 383C), Computer Science 383C, Mathematics 383E, or Statistics and Data Sciences 393C (or Statistics and Scientific Computation 393C); and Mathematics 427K and 365C, or consent of instructor.

### **SDS 394. Scientific and Technical Computing.**

Comprehensive introduction to computing techniques and methods applicable to many scientific disciplines and technical applications. Covers computer hardware and operating systems, systems software and tools, code development, numerical methods and math libraries, and basic visualization and data analysis tools. Three lecture hours a week for one semester. Statistics and Data Sciences 394 and Statistics and Scientific Computation 394 may not both be counted. Prerequisite: Graduate standing, and a third-semester calculus course or the equivalent; prior programming experience is recommended.

### **SDS 394C. Parallel Computing for Science and Engineering.**

Parallel computing principles, architectures, and technologies. Parallel application development, performance, and scalability. Designed to prepare students to formulate and develop parallel algorithms to implement effective applications for parallel computing systems. Three lecture hours a week for one semester. Statistics and Data Sciences 394C and Statistics and Scientific Computation 394C may not both be counted. Prerequisite: Graduate standing, a third-semester calculus course or the equivalent, a linear algebra course or a matrices course, and prior programming experience using C or Fortran on Linux or Unix systems.

### **SDS 394D. Distributed and Grid Computing for Science and Engineering.**

Distributed and grid computing principles and technologies. Covers common modes of grid computing for scientific applications, developing grid-enabled applications, and future trends in grid computing. Three lecture hours a week for one semester. Statistics and Data Sciences 394D and Statistics and Scientific Computation 394D may not both be counted. Prerequisite: Graduate standing, a third-semester calculus course or the equivalent, a linear algebra course or a matrices course, and prior programming experience using C or Fortran on Linux or Unix systems.

### **SDS 394E. Visualization and Data Analysis for Science and Engineering.**

Scientific visualization principles, practices, and technologies, including remote and collaborative visualization. Introduces statistical analysis, data mining, and feature detection. Three lecture hours a week for one semester. Statistics and Data Sciences 394E and Statistics and Scientific Computation 394E may not both be counted. Prerequisite: Graduate standing, a third-semester calculus course or the equivalent, a linear algebra course or a matrices course, and prior programming experience using C or Fortran on Linux or Unix systems.

### **SDS 395. Advanced Topics in Scientific Computation.**

Three lecture hours a week for one semester. Statistics and Data Sciences 395 and Statistics and Scientific Computation 395 may not both be counted unless topics vary. May be repeated for credit when the topics

vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

### **SDS 197R. Statistics Internship.**

May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of graduate adviser.

### **SDS 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Statistics and Data Sciences 398R and Statistics and Scientific Computation 398R may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in statistics and data sciences, consent of supervising professor, and consent of graduate adviser.

### **SDS 398T. Supervised Teaching in Statistics and Data Sciences.**

Supervised teaching experience; weekly group meetings, individual consultations, and reports. Three lecture hours a week for one semester. Statistics and Data Sciences 398T and Statistics and Scientific Computation 398T may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and appointment as a teaching assistant.

### **SDS 399R, 699R, 999R. Dissertation.**

Statistics and Data Sciences 399R, 699R, 999R and Statistics and Scientific Computation 399R, 699R, 999R may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and written consent.

### **SDS 399W, 699W, 999W. Dissertation.**

Statistics and Data Sciences 399W, 699W, 999W and Statistics and Scientific Computation 399W, 699W, 999W may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing; Statistics and Data Sciences 399R (or Statistics and Scientific Computation 399R), 699R (or Statistics and Scientific Computation 699R), or 999R (or Statistics and Scientific Computation 999R); and written consent.

## **Textile and Apparel Technology**

*Master of Science in Textile and Apparel Technology*

### **For More Information**

**Campus address:** Mary E. Gearing Hall (GEA) 121, phone (512) 471-0941, fax (512) 471-5630; campus mail code: A2700

**Mailing address:** The University of Texas at Austin, Graduate Program in Textile and Apparel Technology, 200 West 24th Street Stop A2700, Austin TX 78712

**E-mail:** [he-txa@utlists.utexas.edu](mailto:he-txa@utlists.utexas.edu)

**URL:** <http://www.he.utexas.edu/txa/>

### **Areas of Study**

The international textile and apparel industry operates as a total system that integrates environment, strategy, structure, and performance. Innovative research, effective product management and design, and optimal product management rely on the creative use of advanced technology. The master's program is designed to prepare students to meet the challenges of design-driven industries through innovative

problem solving, product development, and managerial strategies that incorporate the application of new technologies.

## **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Jonathan Yan Chen  
Richard L Corsi  
Sheldon Ekland-Olson

Mourad Krifa  
Julia A Reed  
Bugao Xu

## **Admission and Degree Requirements**

Students seeking a graduate degree in textile and apparel technology should have a strong academic background in textiles, apparel, or a related field.

### **Master of Science in Textile and Apparel Technology**

Thirty-one to thirty-two semester hours of coursework are required for the degree and should be distributed as follows: (1) thirteen to fourteen hours in specified textiles and apparel core courses; (2) twelve hours in supporting fields, nine hours of which are specified; and (3) six hours in the thesis completing an original research project. The Graduate Studies Committee must approve the student's Program of Work.

## **Graduate Courses**

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### **Textiles and Apparel: TXA**

#### **TXA 392. Research Problems in Textile and Apparel Technology.**

Directed research in various topics in the area of textile and apparel technology. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in textile and apparel technology, or graduate standing and consent of instructor.

#### **TXA 394. Recent Advances in Textile and Apparel Technology.**

An in-depth study of textile and apparel topics. Students may read original research papers and carry out fieldwork assignments. Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in textile and apparel technology, or graduate standing and consent of instructor.

#### **Topic 1: Advances in Product Development and Technical Design.**

Development of specification, sizing, grading systems, and quality control methodology. Three lecture hours a week for one semester.

#### **Topic 2: International Sourcing and the Global Economy.**

Economic, social, and public issues related to international production and sourcing of textiles and apparel. Three lecture hours a week for one semester.

**Topic 3: E-Commerce and Direct Marketing.** Recent developments and evaluation of nontraditional retailing of apparel. Three lecture hours a week for one semester.

**Topic 4: Textile Instrumentation.** Application of image analysis, neural networks, and wavelet transforms to textile and apparel products. Three lecture hours a week for one semester.

**Topic 5: Digital Design and Printing.** Principles and elements of digital design and printing. Recent developments in digital knits, weaves, prints, and nonwoven textiles. Two lecture hours and three laboratory hours a week for one semester.

**Topic 6: Textile Functional Finishes.** Study of the application and adaptation of functional finishes to textiles. Three lecture hours a week for one semester.

**Topic 7: Textile Microscopy and Image Analysis.** Basic techniques for characterizing fiber properties visually with a microscope and using technology and computer analysis. Three lecture hours a week for one semester.

**Topic 8: Digital Modeling of Textiles.** Recent developments in two- and three-dimensional modeling. Three lecture hours a week for one semester.

**Topic 9: Production Mechanics and Properties of Woven Fabrics.** The relationship between the mechanics of production and mechanical properties of woven fabric; the unit operations required to prepare yarns for weaving and the mechanisms employed in weaving; fabric structure, geometry, and mechanical properties; designing for specific fabric properties. Three lecture hours a week for one semester.

**Topic 10: Global Textile and Apparel Business Dynamics.** Elements of competitive strategy and planning methods within the textile complex, with an emphasis on the concepts of strategy in a mature industry, defining business in a global industry, allocating resources through strategic planning methods, and implementing strategy in single- and multi-business firms. Three lecture hours a week for one semester.

**Topic 11: Market Research in Textiles.** Study and analysis of quantitative methods employed in market research in the textile industry, including the function of market research and its proper orientation to management and decision making. Three lecture hours a week for one semester.

**Topic 12: Color Science.** The basis of modern techniques for color specification, measurement, control, and communication. Applications of color science to textiles, plastics, color reproduction, computer-based imaging, and display systems. Basic concepts are taught using computer color graphics. Three lecture hours a week for one semester.

### **TXA 395. Seminar in Textiles and Apparel.**

Lectures and discussions on current topics in textiles and apparel. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in textile and apparel technology, or graduate standing and consent of instructor.

**Topic 1: Mass Customization of Apparel.** The principles and implementation of newly developed three-dimensional technology for apparel mass customization.

**Topic 2: Advanced Functional Textiles.** Current science and technology concerning functional textiles. Emphasis is on the relationship between materials, development, structure, and properties.

### **TXA 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in textile and apparel technology and consent of the graduate adviser; for 698B, Textiles and Apparel 698A.

## **UTeach–Natural Sciences**

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### **UTeach-Natural Sciences: UTS**

#### **UTS 180, 280, 380, 680, 980. Topics in Teaching Math and Science.**

In-depth investigation of topics in math or science as related to teaching at a secondary level. For each semester hour of credit earned, one lecture hour a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of the graduate adviser or the department chair.

## **School of Nursing**

*Master of Science in Nursing*

*Doctor of Philosophy*

*Doctor of Nursing Practice*

The Master of Science in Nursing degree program is fully accredited by the Commission on Collegiate Nursing Education (CCNE).

### **For More Information**

**Campus address:** School of Nursing, phone (512) 471-7927 fax (512) 232-4777; campus mail code: D0100

**Mailing address:** The University of Texas at Austin, Graduate Student Services, School of Nursing, 1710 Red River Street Stop D0100, Austin TX 78701-1499

**E-mail:** [nugrad@uts.cc.utexas.edu](mailto:nugrad@uts.cc.utexas.edu)

**URL:** <http://www.utexas.edu/nursing/>

### **Facilities for Graduate Work**

In addition to the extensive library and computer resources of the University, certain special resources within the School of Nursing provide support for graduate work.

**The Cain Center for Nursing Research.** The focus of this office is the promotion of funded research by nursing faculty members. The staff provides support and consultation services and compiles information about opportunities for research funding and presentations, including some for which graduate students are eligible. The computer laboratory is used for graduate courses and is available for graduate student research projects. The research office also provides employment opportunities for graduate students interested in experience as research assistants.

**The Learning Center.** The Learning Center includes an audiovisual and reference library; a graphic and audiovisual production studio; clinical simulation laboratories for teaching psychomotor nursing skills; and a computer classroom and user facility equipped with Macintosh and Windows-based computers. Group study rooms and individual study carrels are available.

**Clinical research and practice sites.** The School of Nursing has access to a wide variety of private practice, community, and state facilities for

field research and clinical placement. These include all major health care facilities in Austin and in several surrounding communities.

## Areas of Study

Graduate work in the School of Nursing may lead to either the Master of Science in Nursing, Doctor of Philosophy, or Doctor of Nursing Practice degree. Students may also choose to complete an Advanced Practice Registered Nurse Certificate program. The master's degree program is designed to give students the theoretical, analytical, and clinical knowledge and skills needed for specialized nursing practice. Those preparing for advanced practice should choose either the clinical nurse specialist track, with a concentration in adult-gerontology nursing; or the nurse practitioner track, with a concentration in family, pediatric, or family psychiatric mental health. Students preparing for a career emphasizing leadership in the emerging health care system should choose the leadership in diverse settings track.

The Doctor of Nursing Practice program emphasizes leadership in the clinical area through the application of evidence-based practice and knowledge to solve problems and create a culture of change through leadership. Graduates of the program typically enter clinical leadership positions in health care institutions and faculty positions in schools of nursing. The Doctor of Philosophy program emphasizes the acquisition of a sound foundation in nursing science and research methods as a basis for developing nursing knowledge and scholarship. Graduates of the doctoral program typically enter positions in nursing education, research, or executive management of health care agencies. Some prepare to make contributions to the development of nursing theory or health policy.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Gayle J Acton	Miyong Kim
Sung-Heui Bae	Eileen K Kintner
Heather A Becker	Kavita Radhakrishnan
Mary M Benham-Hutchins	Donna L Rew
Sharon A Brown	Cherie E Simpson
Linda J Carpenter	Alexa M Stuijbergen
Patricia A Carter	Gayle M Timmerman
Jane Dimmitt Champion	Deborah L Volker
Alexandra A Garcia	Lorraine O Walker
Tracie C Harrison	Bo Xie
Sharon D Horner	Linda H Yoder
Karen Johnson	Cara Young
Terry L Jones	

## Admission and Degree Requirements

### Master of Science in Nursing

The entering student normally holds a bachelor's degree from a program accredited by the National League for Nursing or the Commission on Collegiate Nursing Education and holds a registered nurse license that allows the student to practice as a registered nurse in Texas. Registered nurses with non-nursing baccalaureate degrees may also apply. Applicants who wish to pursue the family or pediatric nurse practitioner tracks must have at least one to two years of clinical practice experience as a registered nurse within the last five years at the time of application deadline to be considered for admission. Please visit the Advanced Practice Nursing Web site ([http://www.utexas.edu/nursing/academics/gr\\_apn.html#apncomp](http://www.utexas.edu/nursing/academics/gr_apn.html#apncomp)) for more information.

Factors considered in the admission decision include satisfactory scores on the Graduate Record Examinations General Test, with attention given to the relative balance between verbal and quantitative scores; a grade point average of at least 3.00 in upper-division and graduate coursework; information derived from academic and professional references; professional background and goals; and proficiency in the English language. An interview may also be required. The composite picture presented by these factors is an important part of the admission review and decision.

All students are expected to complete an approved upper-division statistics course prior to or during the first semester of enrollment. Since all courses are not offered each semester, the student who waits to complete the statistics requirement after enrolling may find that his or her course sequence is altered. As a result, the student may need more time to complete the degree program.

The advanced practice registered nurse tracks, adult-gerontology clinical nurse specialist, family nurse practitioner, pediatric nurse practitioner, and family psychiatric/mental health nurse practitioner require a minimum of forty-eight semester hours of coursework. The leadership in diverse settings track requires a minimum of thirty-nine hours.

Preparation of a thesis is optional; when this option is chosen, an additional three to six semester hours are required.

Program components are: (1) core courses that provide advanced theoretical and research knowledge and a deeper understanding of professional issues; (2) courses in the student's track/concentration; (3) advanced practice core courses (required for students in the adult-gerontology clinical nurse specialist and nurse practitioner tracks); and (4) supporting/elective courses, which may include courses from outside nursing.

### Master of Science in Nursing: Alternate Entry

The alternate entry program is designed for the student who has no previous degrees in nursing, who desires a career in nursing practice, and who holds at least a bachelor's degree in a discipline other than nursing. The program is fully approved by the Texas Board of Nursing and is nationally accredited. Program options for alternate entry students include leadership in diverse settings, adult-gerontology clinical nurse specialist, and family psychiatric mental health nurse practitioner.

Admission requirements include at minimum a bachelor's degree in a discipline other than nursing; satisfactory scores on the Graduate Record Examinations General Test, with attention given to the relative balance between verbal and quantitative scores; a grade point average of at least 3.00 in upper-division and graduate coursework; satisfactory academic and/or professional references; personal and professional goals compatible with the purpose of the program; and proficiency in the English language. An interview may also be required. The composite picture presented by these factors is an important part of the admission review and decision.

Prerequisite courses in upper-division statistics and the natural and behavioral sciences must be completed prior to enrollment. Of the required prerequisites, the courses in anatomy, chemistry, and microbiology must be completed by December 31 of the application year. All students must be fully compliant with program requirements, including clearance of a background check from the Texas Board of Nursing prior to beginning the alternate entry pre-licensure summer courses. All pre-licensure courses must be completed with a grade of at least C to progress in the alternate entry curriculum.

Practicing nurses and nursing students are held to a high standard of competencies in order to perform responsible and safe care. Successful completion of the nursing program requires that students demonstrate ability to effectively and safely perform several essential skills. Students considering this major must meet the required standards. For more information, please see Professional and Technical Standards for Nursing Practice (PDF) ([http://www.utexas.edu/nursing/docs/academics/grad/tech\\_stand\\_nur\\_prac.pdf](http://www.utexas.edu/nursing/docs/academics/grad/tech_stand_nur_prac.pdf)).

The alternate-entry student is eligible to take the licensure examination to become a registered nurse (NCLEX-RN) in the state of Texas after completing thirty-eight semester hours of foundation courses. The student must pass Nursing 290S in order to enroll in the first semester of courses following the foundation courses. The student must be a registered nurse in order to enroll in graduate nursing courses following the foundation year. Depending on the chosen concentration, students must complete a minimum of seventy-four to eighty-three semester hours of coursework. Preparation of a thesis is optional; when this option is chosen, an additional three to six semester hours are required.

Program components are: (1) accelerated foundation courses in all major clinical areas of nursing; (2) core courses that provide advanced theoretical and research knowledge and a deeper understanding of professional issues; (3) courses in one of the nursing tracks available to the alternate-entry student; (4) advanced practice core courses (required for students in the adult-gerontology clinical nurse specialist, family psychiatric/mental health nurse practitioner); and (5) supporting/elective courses, which may include courses from outside nursing.

## Doctorate of Nursing Practice

The entering student must be a registered nurse who holds either a bachelor's or a master's degree in nursing from a program accredited by the National League for Nursing, the Commission on Collegiate Nursing Education or a recognized degree from a foreign academic institution. Factors considered in the admission decision include satisfactory scores on the Graduate Record Examinations General Test, with attention given to the relative balance between verbal and quantitative scores; a grade point average of at least 3.00 in upper-division and graduate coursework; eighteen months of professional work experience; current Texas RN licensure or Texas Board of Nursing eligible; information derived from academic and professional references; professional background; a satisfactory interview; and proficiency in the English language. The composite picture presented by these factors is an important part of the admission review and decision.

All students will complete nine hours of core courses before enrolling in supporting or clinical courses. Following completion of the core courses, twenty-four hours of supporting courses can be taken in any order. Additionally, twelve hours of clinical specialization courses will be taken in sequential order after the core courses are completed. Within these clinical specialization seminars, students will select and develop an area of focus that will culminate in the DNP project.

## Doctor of Philosophy

The entering student must be a registered nurse who holds either a bachelor's or a master's degree in nursing from a program accredited by the National League for Nursing, the Commission on Collegiate Nursing Education, or a recognized degree from a foreign academic institution. The occasional student who holds no master's degree or a master's degree in another discipline will be required to complete prescribed graduate bridge courses in nursing as a condition of admission. Bridge courses may not be counted toward degree requirements. These students may also choose to complete a Master of Science in Nursing degree en route to the PhD.

Factors considered in the admission decision include satisfactory scores on the Graduate Record Examinations General Test, with attention given to the relative balance between verbal and quantitative scores; a grade point average of at least 3.00 in upper-division and graduate coursework; information derived from academic and professional references; professional background; congruence of the student's research goals with the expertise of the nursing faculty; a satisfactory interview; and proficiency in the English language. The composite picture presented by these factors is an important part of the admission review and decision.

All students are expected to complete an approved upper-division statistics course prior to or during the first semester of enrollment. In addition, all students must pass a doctoral qualifying examination before entering candidacy for the degree. Students must complete at least fifty-seven semester hours of coursework.

The degree program requires completion of the following coursework: (1) core courses focused on advanced theoretical, analytical, and research method skills; (2) seminars and related supporting courses in a focused area of study; (3) research practicum courses; and (4) dissertation courses.

## Doctor of Philosophy: Alternate Entry

The alternate entry program is designed for the student who has no previous degrees in nursing, who desires a career as a nurse scientist, and who holds at least a bachelor's degree in a discipline other than nursing. The program is fully approved by the Texas Board of Nursing. Alternate-entry PhD students may choose to complete a Master of Science in Nursing degree en route to the PhD if desired.

Factors considered in the admission decision include at least a bachelor's degree in a discipline other than nursing; satisfactory scores on the Graduate Record Examinations General Test, with attention given to the relative balance between verbal and quantitative scores; a grade point average of at least 3.00 in upper-division and graduate coursework; information derived from academic and professional references; professional background; congruence of the student's research goals with the expertise of the nursing faculty; a satisfactory interview; and proficiency in the English language. The composite picture presented by these factors is an important part of the admission review and decision.

Prerequisite courses in upper-division statistics and the natural and behavioral sciences must also be completed prior to enrollment. Of the required prerequisites, the courses in anatomy, chemistry, and microbiology must be completed by December 31 of the application year. All students must be fully compliant with program requirements, including clearance of a background check from the Board of Nursing prior to beginning the alternate entry pre-licensure summer courses. All pre-licensure courses must be completed with a grade of at least C to progress in the alternate entry curriculum.

Practicing nurses and nursing students are held to a high standard of competencies in order to perform responsible safe care. Successful completion of the nursing program requires that students demonstrate ability to effectively and safely perform several essential skills. Students considering this major must meet the required standards. For more information please view Professional and Technical Standards for Nursing Practice (PDF) ([http://www.utexas.edu/nursing/docs/academics/grad/tech\\_stand\\_nur\\_prac.pdf](http://www.utexas.edu/nursing/docs/academics/grad/tech_stand_nur_prac.pdf)).

The alternate-entry PhD student is eligible to take the licensure examination to become a registered nurse (NCLEX-RN) in the state of Texas after completing thirty-eight semester hours of foundation courses. The student must pass Nursing 290S in order to enroll in the first semester of courses following the foundation courses. The student must be a registered nurse in order to enroll in graduate nursing courses

following the foundation year. The student must pass a doctoral qualifying examination before entering candidacy for the doctoral degree. Students must complete at least 106 semester hours of coursework.

Program components are: (1) accelerated foundation courses in all major clinical areas of nursing; (2) master's level bridge courses, which provide advanced theoretical and research knowledge and a deeper understanding of professional issues; (3) doctoral core courses focused on advanced theoretical, analytical, and research method skills; (4) seminars and related supporting courses in a focused area of study; (5) research practicum courses; and (6) dissertation courses.

## Advanced Practice Registered Nurse Certification

The post-master's Advanced Practice Registered Nurse Certification (APRN) certificate programs are designed for those nurses who have a master's in nursing from a program accredited by the National League for Nursing or the Commission on Collegiate Nursing Education or a recognized degree from a foreign academic institution and wish to complete the course work necessary to sit for national certification as an APRN. Students choose a certificate track as a 1) Family Nurse Practitioner, 2) Pediatric Nurse Practitioner, 3) Family Psych/Mental Health Nurse Practitioner, or 4) Adult-Gerontology Clinical Nurse Specialist. Upon completion of the advanced practice coursework, one of the following will appear on the student's transcript: family nurse practitioner, pediatric nurse practitioner, family psychiatric mental health nurse practitioner, or adult-gerontology clinical nurse specialist. Factors considered in the admission decision include a grade point average of at least 3.00 in upper-division and graduate coursework; satisfactory scores on the Graduate Record Examinations general test (post-master's students are not required to take the Graduate Record Examinations); information derived from academic and professional references; professional background and goals; and proficiency in the English language. An interview may also be required. The composite picture presented by these factors is an important part of the admission review and decision.

## Legal Requirements

In the interest of public safety, there are legal restrictions on enrollment in some nursing courses and on eligibility for RN licensure. Factors that may make an individual ineligible for licensure in Texas include prior denial of a license by a licensing authority; disciplinary action by a licensing/certifying authority; conviction for a crime other than a minor traffic violation; diagnosis/treatment/hospitalization in the past five years for schizophrenia or other psychotic disorders, bipolar disorder, paranoid personality disorder, antisocial personality disorder, or borderline personality disorder; addiction or treatment for addiction to alcohol or any other drug during the previous five years; and having been issued a declaratory order concerning eligibility for NCLEX examination or licensure or having received a proposal of ineligibility by the Texas Board of Nursing.

To avoid delay in course enrollment, delay or denial of licensure, or possible disciplinary action and criminal prosecution for later discovery of falsified records, those with a history of any of the factors listed above are strongly urged to apply for a determination of eligibility for licensure. Request for a determination should be made as early as possible, prior to or upon enrolling in the nursing program. Such a determination, called a Declaratory Order, is issued by the Texas Board of Nursing. Issuance of a Declaratory Order takes a minimum of three to six months. More information is available on the Texas Board of Nursing Web site (<http://www.bon.state.tx.us>).

## Compliance

Students must provide documentation confirming completion of compliance requirements prior to commencement of degree program. Log in to the School of Nursing intranet site (<https://sp.austin.utexas.edu/sites/nursing/SitePages/Home.aspx>) for more information.

- Medical clearance requirements—immunizations.
- Criminal background check—required of alternate entry students and registered nurses who received initial licensure prior to 2003. Students with concerns about eligibility are urged to seek official determination from the Texas Board of Nursing (<http://www.bon.state.tx.us>) six months in advance of beginning clinical courses to allow sufficient time for Texas Board of Nursing approval.
- Drug screen—a clear drug screen to be completed one month prior to the first day of class in the first semester of a student's program.
- CPR certification (Basic Life Support for Health Care Providers, offered by the American Heart Association).
- Basic first aid certification for alternate entry students only.
- Professional liability insurance (purchased each year through the School of Nursing).
- Completion of School of Nursing orientation training modules.
- Completion of School of Nursing scholastic dishonesty and professional integrity and honor code forms.
- Licensure as a registered nurse in Texas or holds a license that allows the student to practice as a registered nurse in Texas (except for alternate-entry students in foundation courses).
- Employment background check.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Nursing: N

#### N 180C. Psychopharmacology for Advanced Practice Nurses.

Covers prescribing and monitoring medications commonly used with patients who have psychiatric or mental health problems. One lecture hour a week for one semester. Prerequisite: Graduate standing; and Nursing 395C, 396C, 396J, and 196K, or consent of instructor.

#### N 380D. Family Care Concepts in Psychiatric and Mental Health Nursing.

Covers advanced psychiatric and mental health nursing care involving families with complex relational problems in a variety of clinical settings. Addresses theoretical, ethical, and evidence-based practices to provide culturally sensitive care within the community context. Emphasis is on recommended practices, treatment protocols, and critical thinking skills. Two lecture hours and four laboratory hours a week for one semester. Prerequisite: Graduate standing in the School of Nursing; and Nursing 392E, 392Q, 395C, 396C, 396J, 196K, 396L, and 296M, or consent of instructor.

#### N 280E. Role of the Family Psychiatric and Mental Health Nurse Practitioner.

Focuses on legal, political, and ethical issues affecting the family psychiatric and mental health nurse practitioner. Two lecture hours a

week for one semester. Prerequisite: Graduate standing in the School of Nursing.

### **N 380F. Advanced Psychiatric and Mental Health Nursing I.**

Studies the theory and evidence bases for diagnosis and management of a variety of common psychiatric and behavioral disorders. Emphasizes diagnostic reasoning, clinical decision-making, and therapeutic strategies appropriate for the role of the family psychiatric and mental health nurse practitioner. Considers the sociocultural and community context for patient care. Three lecture hours a week for one semester. Prerequisite: Graduate standing in the School of Nursing, and consent of instructor or one of the following: Nursing 392E, 392Q, 395C, 396C, 396J, 196K, 396L, and 296M; concurrent enrollment in Nursing 380G; credit or registration for Nursing 180C.

### **N 380G. Advanced Psychiatric and Mental Health Nursing I: Clinical.**

A precepted, clinical environment in which to apply knowledge related to biological and psychosocial theories, pharmacology, health promotion, and ethics to patients and families with common psychiatric and behavioral disorders. Emphasis is placed on role development using standardized procedures and tools that assist in diagnosis, treatment, and developing beginning-level therapy skills in multiple modalities. Twelve laboratory hours a week for one semester. Prerequisite: Graduate standing in the School of Nursing, and consent of instructor or one of the following: Nursing 380D, concurrent enrollment in Nursing 380F, credit or registration for Nursing 180C.

### **N 380H. Advanced Psychiatric and Mental Health Nursing II.**

In-depth focus on the role of the family psychiatric and mental health nurse practitioner using theoretical bases for care of complex psychiatric and mental health patients with psychopathology in a variety of settings across the life span. Students integrate various biological and psychosocial theories with psychopharmacology, health promotion, and ethical decision-making to develop culturally sensitive care. Emphasizes evidenced-based practices, recommended practices and treatment protocols, ethical decision making, and critical thinking strategies that are integral to the role of the family psychiatric and mental health nurse practitioner. Three lecture hours a week for one semester. Prerequisite: Graduate standing in the School of Nursing; and Nursing 380F and 380G, and concurrent enrollment in Nursing 480J, or consent of instructor.

### **N 480J. Advanced Psychiatric and Mental Health Nursing II: Clinical.**

Studies the role of the advanced psychiatric and mental health nurse practitioner in providing care for patients and families with complex psychopathology and psychiatric and mental health problems in a variety of clinical settings. Knowledge from biological and psychosocial theories, psychopharmacology, health promotion, and ethics to develop culturally sensitive care. Emphasizes role development, evidenced-based practices, recommended practices and treatment protocols, ethical decision making, and critical thinking strategies. Sixteen laboratory hours a week for one semester. Prerequisite: Graduate standing in the School of Nursing; and Nursing 380F and 380G, and concurrent enrollment in Nursing 380H, or consent of instructor.

### **N 380L. Theory Development in Nursing.**

Introduction to the nature of scientific explanation and inquiry. Critique of theoretical conceptualization in nursing. Examination of strategies for theory development. Analysis of the role of theory in nursing as a practice discipline. Three lecture hours a week for one semester. Required of all doctoral students. Prerequisite: Graduate standing.

### **N 380M. Historical and Philosophical Study of Nursing.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Philosophical Aspects of Nursing.** Introduction to the analysis of nursing language: defining terms, detecting logical fallacies, analyzing meanings, and recognizing descriptive and normative aspects of judgments.

**Topic 2: Historical Development of Nursing.** In-depth study of the history of nursing, with emphasis on influences on the profession and changes that have occurred within it. Review of the association of nursing with related disciplines, its emergence into institutions of higher learning, organizational structure and hierarchy, changes in educational focus resulting from the preparation of educational leaders, and related topics.

**Topic 3: Philosophy of Nursing Theory.** Advanced seminar in the application of philosophical aspects of nursing theory. Additional prerequisite: Nursing 380L.

**Topic 4: Philosophical and Theoretical Bases of Nursing Science.** Philosophical principles and theories that contribute to the ongoing evolution of nursing science. Explores the historical development of nursing as a professional discipline in the context of philosophy and science. Prerequisite: Graduate standing and Nursing 397L (Topic 4: Critical Review of the Literature).

### **N 280Q. Psychiatric Assessment and Therapeutic Skills.**

Introduces the advanced knowledge and skills related to psychiatric mental health assessment of individuals and families through the life span. Interviewing skills, psychiatric assessment techniques, and tools will be used to determine mental health status. Basic therapy skills from evidence-based practice and established therapeutic communication techniques are presented. Emphasis on synthesis of theories and knowledge from nursing, biology, psychiatry, psychology, and sociocultural studies as they apply to the comprehensive assessment of clients with psychiatric and mental health concerns. Assessment and therapy skills commensurate with the role of the Family Psychiatric-Mental Health Nurse Practitioner. One and one half lecture hours and two laboratory hours a week for one semester. Prerequisite: Graduate standing; and Nursing 395C, 396C, 396J, and 196K, or consent of instructor.

### **N 281C. Health Informatics.**

Explores the challenges and career opportunities associated with the increased usage of information and communication technologies in areas such as health information management, electronic health records, and consumer and public health informatics. Discusses the social, cultural, political, economic, technological, historical, and ethical issues associated with health informatics. Two lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **N 381M. Adult Health Nursing.**

The equivalent of three class hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Theoretical Foundations in Adult Health (Adult Health I).** Theoretical underpinnings for research in adult health nursing. Analysis of theories related to person, health, and environment for their applicability to adult health nursing. Nursing 381M (Topic 1) and (Topic 5) may not both be counted.

**Topic 2: Substantive Areas in Adult Health (Adult Health II).** Overview of nursing issues, psychosocial and physiological concepts, and research findings related to health promotion and health care needs of adults. Designed to help students develop the conceptual



component of the dissertation research. Nursing 381M (Topic 2) and 397L (Topic 4: Critical Review of the Literature) may not both be counted.

**Topic 3: Research in Adult Health (Adult Health III).** Application of methodology and theory development to research studies in adult health, with emphasis on analysis and development of methods for research in adult health nursing. Additional prerequisite: Nursing 381M (Topic 1 or Topic 2) and 397L.

**Topic 4: Advanced Dissertation Seminar (Adult Health IV).** Structured reference group for discussion of theoretical and methodological aspects of the dissertation research process. Additional prerequisite: Nursing 380L, 381M (Topic 1), 381M (Topic 2), 381M (Topic 3), and 397K.

**Topic 5: Theories of Health Behavior.** The theoretical underpinnings for research related to health behaviors and health behavior change for individuals, groups, or systems. Nursing 381M (Topic 1) and 381M (Topic 5) may not both be counted. Additional prerequisite: Nursing 380M (Topic 4: Philosophical and Theoretical Bases of Nursing Science).

### **N 381R. Theoretical Foundations of Aging.**

Theories in gerontology as applied to nursing practice. Two and one-half lecture hours and one and one-half laboratory hours a week for one semester. Prerequisite: Graduate standing.

### **N 381S. Gerontological Nursing.**

Physiological changes in the elderly, and their implications for nursing practice. Two lecture hours and four and one-half laboratory hours a week for one semester. Prerequisite: Graduate standing and Nursing 381R.

### **N 281V. Leadership in Diverse Settings Advanced Nursing Practicum.**

Precepted practicum focusing on advanced nursing concepts and skills in a setting selected with consideration of the student's interest, needs, goals, and objectives. Assessments of individuals, families, or groups, and their environments, implementation of appropriate evidence-based specialized nursing interventions, and evaluation the role of master's prepared nurses in diverse practice settings. Eight laboratory hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing, Nursing 396C, 396J, and credit or registration for Nursing 392Q and 395C; or graduate standing and consent of instructor.

### **N 281W. Leadership in Diverse Settings Advanced Nursing Capstone Practicum.**

Focuses on program evaluation, policy implications and analysis, and development of leadership in diverse settings. Eight laboratory hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and Nursing 281V.

### **N 382. Sociocultural Influences on Health.**

Focuses on factors associated with health status, health care, and health policies. Using an ecological approach, the course explores relationships among individual characteristics such as gender, education, income, literacy, race, ethnicity, culture, acculturation, disability, age, and sexual orientation; interpersonal factors such as communication with health care providers, family and social ties, and discrimination; and societal-level factors such as neighborhood and community context, health care organizations, economics, politics and policies and seeks to understand how those factors shape health behaviors, access to health care services, and health status locally, nationally, and globally. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **N 382H. Health Care Delivery.**

Overview of the health care delivery system in the United States--its definition, characteristics, and components. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **N 284C. Professional Nursing Foundations.**

Introduction to fundamental nursing care concepts, processes, and skills, including communication and assessment. One lecture hour and four laboratory hours a week for one semester. Prerequisite: Graduate standing and admission to the alternate entry MSN program.

### **N 384D. Conceptual Foundations of Nursing.**

Life-span, health-related phenomena and concepts essential to effective nursing practice with multiple levels of clients. Three lecture hours a week for one semester. Prerequisite: Graduate standing, admission to the alternate entry MSN program, and Nursing 484C.

### **N 484E. Nursing Responses to Physiological Alterations in Health.**

Discussion of physiological alterations across the life span and of the nursing measures indicated to restore and maintain health. Four lecture hours a week for one semester. Prerequisite: Graduate standing, admission to the alternate entry MSN program, and Nursing 484C.

### **N 484F. Adult Health Nursing I.**

Discussion and application of concepts and theories necessary to promote and restore the health of adults with biological problems and related physiological and psychological responses. One and one-half lecture hours, two hours of skills laboratory, and eight hours of clinical work a week for one semester. Nursing 484F and 387F may not both be counted. Nursing 484F and 390F may not both be counted. Prerequisite: Graduate standing, admission to the alternate entry MSN program, and Nursing 484C.

### **N 484G. Conceptual Bases of Mental Health Nursing.**

Current perspectives on the etiology, prevention, and treatment of mental disorders in individuals, families, and groups; clinical application of pertinent nursing care. Two and one-half lecture hours and six laboratory hours a week for one semester. Nursing 484G and 287G may not both be counted. Nursing 484G and 290G may not both be counted. Prerequisite: Graduate standing, admission to the alternate entry MSN program, and Nursing 484C.

### **N 484H. Nursing Care of Childbearing and Childrearing Families.**

Concepts, theories, and processes essential to understanding the health concepts and nursing care of families during the childbearing and childrearing years. Four lecture hours a week for one semester. Nursing 484H and 287H may not both be counted. Nursing 484H and 290H may not both be counted. Prerequisite: Graduate standing, admission to the alternate entry MSN program, and Nursing 384D, 484E, 484F, and 484G.

### **N 384J. Nursing Care of Childbearing and Childrearing Families Practicum.**

Clinical application of concepts, theories, processes, and skills pertinent to the care of families during the childbearing and childrearing years. Twelve laboratory hours a week for one semester. Nursing 384J and 287J may not both be counted. Nursing 384J and 290J may not both be counted. Prerequisite: Graduate standing; admission to the alternate entry MSN program; Nursing 384D, 484E, 484F, and 484G; and credit or registration for Nursing 484H.

### **N 284N. Genomic Applications in Nursing.**

The ethical, legal, psychological, and social issues involved in the integration of genetic information into nursing practice. Two lecture hours

a week for one semester. Prerequisite: Graduate standing and admission to the alternate entry MSN program.

#### **N 284P. Aging and Disability.**

Examines concepts and theories of aging and disability. Addresses the changing physical, psychological, social, economic, ethical, legal, and spiritual needs, environmental accommodations, and caregiver responsibilities and needs across the life course. Two lecture hours a week for one semester. Prerequisite: Graduate standing and admission to the alternate entry MSN program.

#### **N 484R. Adult Health Nursing II.**

Discussion and application of core concepts, including nursing management, jurisprudence, and rehabilitation. Studies theories that can be used to promote and restore health of adults with biological problems and related physiological responses. Two lecture hours and eight laboratory hours a week for one semester. Nursing 484R and 387R may not both be counted. Nursing 484R and 290R may not both be counted. Prerequisite: Graduate standing, admission to the alternate entry MSN program, and Nursing 384D, 484E, 484F, and 484G.

#### **N 484S. Integration of Clinical Nursing Knowledge.**

Integration of nursing knowledge derived from didactic and clinical courses with application in the care of clients across the life span and in a variety of settings. One lecture hour and twelve laboratory hours a week for one semester. Nursing 484S and 187S may not both be counted. Nursing 484S and 290S may not both be counted. Prerequisite: Graduate standing, admission to the alternate entry MSN program, and Nursing 484H, 384J, 484Q, and 484R.

#### **N 284T. Professional Nursing Management.**

Examines selected concepts and theories of nursing leadership and management in the context of the nursing work environment and professional nursing career development. Two lecture hours a week for one semester. Prerequisite: Graduate standing; admission to the alternate entry MSN program; Nursing 284C (or 484C), 284N, 284P, 387F, 387R, 390F; and credit or registration for Nursing 187S, 290G, 290H, 290J, 290Q, and 290R.

#### **N 385R. Community Mental Health and Wellness.**

Concepts, theories, and research on the mental health and wellness of individuals, groups, and families living and working in communities. Principles of preventive health care form a philosophical framework within which students analyze, evaluate, and synthesize the concepts and theories used to promote the health and welfare of people in the community. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **N 385S. Advanced Theory and Research in Mental Health.**

Analysis, development, and testing of theories and conceptual models of mental health and illness; examination of relationships among stress, response to traumatic events, and mental health of the individual, family, and groups. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **N 386C. Computers in Nursing.**

Development of competence in computer use and in the application of computer-based techniques to nursing problems. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **N 386E. Evidence-Based Practice and Outcomes in Health Care.**

Theories of evidence-based practice are used to examine complex nursing decision-making activities in clinical and administrative health care settings. Students appraise the health care literature to evaluate the

evidence for implementation of change protocols and apply their learning to clinical and administrative decisions about effecting change to deliver patient-centered care. Review of various methods of dissemination of evidence-based practice and outcomes data. Three lecture hours a week for one semester. Prerequisite: For students in the Master of Science in Nursing program, graduate standing and either Nursing 392 and 392E or consent of instructor; for alternate entry students, graduate standing and either Nursing 384D and 392E or consent of instructor.

#### **N 486F. Budget and Finance in Health Care.**

Conceptual and practical applications of financial management, cost analyses, and budgeting in the contemporary health care delivery system. Four lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **N 386H. Overview of Healthcare System.**

Designed to provide an extensive overview of the U.S. healthcare system. Topics include historical underpinnings, current trends, contemporary issues, and strategies for delivering healthcare in a variety of settings. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **N 386K. Management of Complex Systems in Nursing.**

Introduction to major concepts and theories of individual, group, and organizational behavior, and their application to the management of complex social systems in health care organizations. Three class hours a week for one semester. Students in the dual MSN/MBA program may substitute this course for the required business core course, Business Administration 389T. Prerequisite: Graduate standing.

#### **N 386M. Administrative Decision Making in Nursing Systems.**

Theories of nursing, economics, management science, and decision analysis are used to examine strategic and operational decision activities in the administration of nursing systems. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **N 386P. Practicum in Administrative Decision Making.**

Guided field experience to examine information management and complex decision problems in the administration of nursing systems. Twelve laboratory hours a week for one semester. Prerequisite: Graduate standing and credit or registration for Nursing 386M.

#### **N 386Q. Quality and Safety in Healthcare.**

Examination of quality and safety in the U.S. healthcare system based on quantitative and qualitative research findings, expert opinions, and cultural surveys. Explores and evaluates strategies for creating and sustaining a culture of safety in healthcare. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **N 386R. Nursing Systems: Theory and Research.**

Advanced study of theories and research related to nursing systems of care and patient aggregates within organized settings. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **N 386S. Health Care Systems Outcomes.**

Theoretical and methodological issues related to the study of outcomes of nursing systems of care, including patient, staff, organization, and community health outcomes. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **N 686V. Internship in Administration of Nursing Systems.**

Analysis and implementation of advanced nursing administrative roles. Synthesis of knowledge and skill in designing, implementing, and evaluating nursing system programs. One lecture hour a week for one

semester, and twenty hours of fieldwork a week in a health care agency. Prerequisite: Graduate standing and Nursing 386K, 386M, and 386P.

### **N 387. Best Practices in Clinical Teaching.**

Designed to prepare nurse educators to manage a group of nursing students in a variety of clinical settings. Applies learning theory to specific teaching strategies designed to prepare students for clinical practice. Explores methods for evaluating learning outcomes. Two lecture hours and four laboratory hours a week for one semester. Prerequisite: Graduate standing, and credit or registration for Nursing 387C or consent of instructor.

### **N 387C. Conceptual Foundations of Nursing Education.**

Designed to introduce the student to the essential elements of nursing education. Critical elements include the theoretical bases of teaching and learning, curriculum development, and assessment and evaluation strategies. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **N 387F. Adult Health Nursing I.**

Introduction to concepts, theories, and research findings essential for promoting and restoring the health of adults with selected commonly occurring physiological alterations and responses to health and illness. Three lecture hours a week for one semester. Nursing 484F and 387F may not both be counted. Prerequisite: Graduate standing, admission to the alternate entry MSN program, and credit or registration for Nursing 284C (or 484C).

### **N 287G. Psychiatric-Mental Health Nursing.**

The biological, environmental, cultural, and interpersonal factors affecting individuals with psychiatric-mental health problems. Four and one-half lecture hours a week for seven weeks. Nursing 484G and 287G may not both be counted. Prerequisite: Graduate standing; admission to the alternate entry MSN program; and Nursing 284C (or 484C), 284N, 284P, and 387F.

### **N 287H. Child Health Nursing.**

Integrates concepts, theories, and processes essential to understanding the health and illness of children within the context of the family. Four and one-half lecture hours a week for seven weeks. Nursing 484H and 287H may not both be counted. Prerequisite: Graduate standing; admission to the alternate entry MSN program; and Nursing 284C (or 484C), 284N, 284P, and 387F.

### **N 287J. Maternity Nursing.**

Focuses on the normal processes and physiological alterations that occur before, during, and after pregnancy. Presents concepts, theories, and processes essential for promoting health and addressing health concerns of women, neonates, and their families during the childbearing years. Four and one-half lecture hours a week for seven weeks. Nursing 384J and 287J may not both be counted. Prerequisite: Graduate standing; admission to the alternate entry MSN program; and Nursing 284C (or 484C), 284N, 284P, and 387F.

### **N 287P, 387P, 487P, 587P, 687P. Practicum in Nursing Education.**

Designed to help the student prepare for a variety of roles in nursing education based on individual professional experience and goals. Practice teaching in clinical settings, simulation laboratories, and distant and live classrooms. Students teach patients, nursing staff members, or students individually or as groups. For each semester hour of credit earned, four laboratory hours a week for one semester. Prerequisite: Graduate standing; and credit or registration for Nursing 387, 387C, or 388, or consent of instructor.

### **N 287Q. Public Health Nursing.**

Integration of nursing, public health, and social science concepts and theories essential for promoting and restoring health and preventing disease and disability in aggregates, populations, and communities. Four and one-half lecture hours a week for seven weeks. Nursing 484Q and 287Q may not both be counted. Prerequisite: Graduate standing; admission to the alternate entry MSN program; and Nursing 284C (or 484C), 284N, 284P, 387F.

### **N 387R. Adult Health Nursing II.**

Advanced concepts, theories, and research findings essential for promoting and restoring health of adults with selected complex physiological alterations and responses. Three lecture hours a week for one semester. Nursing 484R and 387R may not both be counted. Prerequisite: Graduate standing; admission to the alternate entry MSN program; Nursing 284C (or 484C), 284N, 284P, 387F; and credit or registration for Nursing 390F.

### **N 187S. Integration of Nursing Knowledge.**

Integration of nursing knowledge derived from didactic and clinical courses, with application in case studies and simulated patients across the life span and in a variety of settings. One seminar hour a week for one semester. Nursing 484S and 187S may not both be counted. Prerequisite: Graduate standing; admission to the alternate entry MSN program; Nursing 387R, 390F; and credit or registration for Nursing 290R.

### **N 388. Strategies of Teaching in Nursing.**

Designed to prepare nurse educators across a spectrum of settings, including patient education, staff development, and college teaching. Explores the application of learning theory to a variety of teaching strategies and methods of evaluating processes and outcomes. Two lecture hours and four laboratory hours a week for one semester. Prerequisite: Graduate standing, and credit or registration for Nursing 387C or consent of instructor.

### **N 389C. Adult-Gerontology Clinical Nurse Specialist: Role Dimensions.**

Survey of the underlying values and the central and core competencies of the adult-gerontology clinical nurse specialist in adults (young adults through older adults) across the spheres of influence (patient, nursing practice, organization/system). Application of theory and research to advanced practice. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and credit or registration for Nursing 392Q or consent of instructor.

### **N 389D. Adult-Gerontology Clinical Nurse Specialist: Health Promotion and Illness Prevention.**

Analysis of physiological, psychosocial, and environmental concepts and testing of assessments and interventions for selected adult patients across the life spectrum (young adults through older adults). Two and one-half lecture hours and two laboratory hours a week for one semester. Prerequisite: Graduate standing, and credit or registration for Nursing 389C, 392E, and 396J.

### **N 589E. Adult-Gerontology Clinical Nurse Specialist: Chronic Illness.**

Analysis of physiological, psychosocial, spiritual, and environmental concepts and testing of assessment and interventions for selected adult-gerontological (AG) patients. The focus is on dynamics of chronic illness and related Adult-Gerontology Clinical Nurse specialist (AG-CNS) roles. Three lecture hours and eight laboratory hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing and Nursing 389C, 389D, 489F, 392E, 395C, 396C, and 396J; or consent of instructor.

**N 389F, 489F. Adult-Gerontology Clinical Nurse Specialist: Acute Care.**

Analysis of physiological, psychosocial, and environmental concepts; testing of assessments and interventions for selected adult nursing clients. For 389F, two lecture hours and four laboratory hours a week for one semester; for 489F, two lecture hours and eight laboratory hours a week for one semester. Prerequisite: Graduate standing; and either consent of instructor or the following coursework: Nursing 389C, 396C, and 396J and credit or registration for Nursing 389D, 392E, and 395C.

**N 389J. Adult Health Nursing: Health Promotion and Risk Reduction.**

Analysis of physiological, psychosocial, cultural, and environmental issues related to health promotion. Explores risk reduction assessment, intervention strategies, the dynamics of health promotion, and related advanced nursing roles. Two lecture hours and four laboratory hours a week for one semester. Prerequisite: Graduate standing and credit or registration for Nursing 396C and 396J, or consent of instructor.

**N 389K. Adult Health Nursing: Chronic and Disabling Conditions.**

Analysis of physiological, psychosocial, cultural, and environmental issues related to chronic conditions. Includes the dynamics of health promotion and risk reduction, symptom management, acute exacerbations, and related nursing roles within the context of chronic and disabling conditions. Two lecture hours and four laboratory hours a week for one semester. Prerequisite: For students in the holistic adult health nursing concentration, graduate standing; and concurrent enrollment in Nursing 392 and 392E, or consent of instructor; for others, graduate standing; and Nursing 389J and credit or registration for Nursing 396C, or consent of instructor.

**N 389L. Adult Health Nursing: Practicum in Adult Health.**

Guided field experience in which the student applies advanced nursing concepts in a selected area of adult health nursing or role specialty. Specific focus is determined by the needs or interests of the student. One lecture hour and eight laboratory hours a week for one semester. Prerequisite: Graduate standing; and Nursing 389J, 389K, 392Q, 392E, and 392, or consent of instructor.

**N 389M. Adult-Gerontology CNS: Practicum I.**

Guided field experience and clinical application of the Adult-Gerontology Clinical Nurse Specialist (AG-CNS) core competencies of: expert coaching, collaboration, consultation, research skills, leadership, and ethical decision-making skills in medically complex adult-gerontology (AG) populations at the patient, nurse, and system level of care. One lecture hour and eight laboratory hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing; Nursing 389C, 389D, 392E, 392P, 392Q, 395C, 396C, 396J, and 489F, or consent of instructor.

**N 489N. Adult-Gerontology CNS: Practicum II.**

Guided field experience to apply the Adult-Gerontology Clinical Nurse Specialist (AG-CNS) practice model roles in the delivery of care for adult-gerontological (AG) patients within a spectrum of acute and complex medical conditions, working at the patient, nursing, and system levels. Prepare the student for certification and credentialing as an AG-CNS. One lecture hour and twelve laboratory hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Nursing 386Q, 589E, 389M, concurrent enrollment in 389P, or consent of instructor.

**N 389P. Diagnosis and Management of Adult-Gerontology Health Problems.**

This seminar course offers theoretical and clinical content for advanced nursing students to provide medical management of health problems

for adult-gerontological patients. Students will learn pattern recognition, critical thinking, analysis, diagnostic testing, differential medical diagnosis, and medical management of common adult-gerontological health problems using an interprofessional team approach. This seminar is appropriate as a support course for other interprofessional graduate students. Three seminar hours a week for a semester. Nursing 489H and 389P may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing; Nursing 589E and credit or registration for 489N, or consent of instructor.

**N 390C. Health Promotion of High-Risk Populations.**

Advanced study of health promotion/illness prevention theories and research, with a focus on selected high-risk populations in the community. Emphasis on analyzing community risk factors, research and theory related to health promotion and illness prevention as applied to individuals, families, aggregates, and organizations, and research related to health outcomes for selected population groups, nationally and internationally. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**N 390D. Public Health in a Global Context.**

Advanced study of theory and research related to public health within a global context. Examines relationships among public health needs and resources, health services, health policy, law, and population health indices. Emphasis is on developing both the knowledge fundamental to population-based health and the research base for optimizing public health through community action. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**N 390F. Adult Health Nursing I Practicum.**

Application of concepts, theories, processes and skills pertinent to promoting and restoring the health of adults with selected commonly occurring physiological alterations and responses. Twelve laboratory hours a week for one semester. Nursing 484F and 390F may not both be counted. Prerequisite: Graduate standing; admission to the alternate entry MSN program; and Nursing 284C (or 484C), 284N, 284P, and 387F.

**N 290G. Psychiatric-Mental Health Nursing Practicum.**

Application of concepts, theories, processes, and skills that are pertinent to promoting mental health and providing nursing care for people with psychiatric and mental illnesses. Seventeen and one-half laboratory hours a week for seven weeks. Nursing 484G and 290G may not both be counted. Prerequisite: Graduate standing; admission to the alternate entry MSN program; Nursing 284C (or 484C), 284N, 284P, 387F; and credit or registration for Nursing 287G and 390F.

**N 290H. Child Health Nursing Practicum.**

Application of concepts, theories, processes, and skills pertinent to the care of children within the context of the family. Seventeen and one-half laboratory hours a week for seven weeks. Nursing 484H and 290H may not both be counted. Prerequisite: Graduate standing; admission to the alternate entry MSN program; Nursing 284C (or 484C), 284N, 284P, 387F; and credit or registration for Nursing 287H and 390F.

**N 290J. Maternity Nursing Practicum.**

Application of concepts, theories, processes, and skills pertinent to the care of women, neonates, and their families during the childbearing years. Seventeen and one-half laboratory hours a week for seven weeks. Nursing 384J and 290J may not both be counted. Prerequisite: Graduate standing; admission to the alternate entry MSN program; Nursing 284C (or 484C), 284N, 284P, 387F; and credit or registration for 287J and 390F.

**N 290Q. Public Health Nursing Practicum.**

Application of public health nursing concepts, theories, and processes pertinent to the care of aggregates, populations, and communities. Seventeen and one-half laboratory hours a week for seven weeks. Nursing 484Q and 290Q may not both be counted. Prerequisite: Graduate standing; admission to the alternate entry MSN program; Nursing 284C (or 484C), 284N, 284P, 387F; and credit or registration for 287Q and 390F.

**N 290R. Adult Health Nursing II Practicum.**

Application of advanced concepts, theories, processes, and skills essential for promoting and restoring the health of adults with selected complex physiological alterations and responses. Eight laboratory hours a week for one semester. Nursing 484R and 290R may not both be counted. Prerequisite: Graduate standing; admission to the alternate entry MSN program; Nursing 284C (or 484C), 284N, 284P, 387F, 390F; and credit or registration for 284T, 387R, 187S.

**N 290S. Integration of Nursing Knowledge Practicum.**

Designed to assist the student in the application and integration of knowledge from didactic and clinical courses in the care of multiple patients. Forty laboratory hours a week for three weeks. Nursing 484S and 290S may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing; admission to the alternate entry MSN program; and Nursing 284T, 187S, 390F, 290G, 290H, 290J, 290Q, 290R.

**N 391D. Advanced Public Health Nursing: Community and Population Assessment.**

Theories and methods to assess populations, communities, and aggregates. Students apply appropriate strategies to assess the strengths and needs of a selected population or community and make public health nursing diagnoses of populations or communities as the foundation for planning public health programs for health promotion and disease prevention. One and one-half lecture hours and six laboratory hours a week for one semester. Prerequisite: Graduate standing and credit or registration for Nursing 391H.

**N 391E. Public Health Assurance and Policy.**

Processes involved in the implementation and evaluation of a population-focused health promotion program based on community data sets and previously collected data; and policy recommendations related to the program. One and one-half lecture hours and six laboratory hours a week for one semester. Prerequisite: Graduate standing and Nursing 391D.

**N 391F. Epidemiology in Public Health.**

A theoretical framework for applied public health epidemiology, including the importance of high-quality data, measures of morbidity and mortality in a population, epidemiological investigations, and the use of epidemiological study designs. Two and one-half lecture hours and two laboratory hours a week for one semester. Prerequisite: Graduate standing.

**N 391G. Public Health Program Development.**

Focus on analyzing and critiquing health promotion and disease prevention initiatives, and obtaining and using relevant community and population-level health data for developing a multilevel health promotion and disease prevention initiative. Two lecture hours and four laboratory hours a week for one semester. Prerequisite: Graduate standing, and Nursing 391D or consent of instructor.

**N 391H. Theories and Critical Issues in Public Health.**

Major concepts and theories that guide public health practice for nurses and other professionals; local, national, and global issues and trends

that shape public health. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

**N 691P. Advanced Public Health Nursing Practice.**

Synthesis of public health nursing knowledge and skills in advanced practice. The multifaceted roles involved in advanced public health nursing practice, with emphasis on the ability to articulate one's professional roles based on theory and practice. One lecture hour and twenty laboratory hours a week for one semester. Prerequisite: Graduate standing and Nursing 391D and 391E.

**N 392. Nursing Phenomena of Concern.**

The major phenomena underlying research and advanced practice in nursing. Concepts derived from these phenomena address the wide range of health, health concerns, and populations that nurses treat. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**N 392E. Applications of Health Care Research.**

Designed to prepare students to discover, examine, and evaluate knowledge, theories, and creative approaches to health care. Focuses on the skills needed to identify research questions in practice, evaluate existing practice in the light of research findings, and develop strategies to incorporate research findings into the clinical setting. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**N 392J. The Art and Science of Family Health.**

Open to all graduate students with consent of instructor. Theoretical foundations for advanced practice in nursing and other disciplines concerned with family health: family, parent, and child health and development theories; conceptual basis for understanding the context in which parent and child health and illness exist; interdisciplinary concepts and theoretical perspectives. Three lecture hours a week for one semester. Prerequisite: Graduate standing in nursing, or graduate standing and consent of instructor.

**N 592K. Parent-Child Nursing I: Childbearing Families.**

Salient concepts and clinical basis for advanced nursing practice with childbearing families, considered from biophysical, psychological, developmental, family, and sociocultural perspectives. Introduction to concepts related to role development as an advanced practice nurse, with emphasis on the promotion of wellness and prevention of illness in pregnant women and their newborns within the context of their families. Students apply these concepts in providing nursing care to childbearing families in a variety of clinical settings under supervision of faculty members and preceptors. Three class hours and eight laboratory hours a week for one semester. Prerequisite: Graduate standing, Nursing 396C and 396J, and credit or registration for Nursing 395C.

**N 592L. Parent-Child Nursing II: Childrearing Families.**

Salient concepts and clinical basis for advanced nursing practice with childbearing families, considered from biophysical, psychological, developmental, family, and sociocultural perspectives. Legal, ethical, and practice issues affecting the advanced practice nurse. Emphasis on promotion of wellness and prevention of illness in children within the context of their families. Students apply concepts in providing nursing care to childrearing families in a variety of clinical settings under supervision of faculty members and preceptors. Three lecture hours and eight laboratory hours a week for one semester. Prerequisite: Graduate standing and Nursing 592K.

**N 392M. Clinical Project in Parent-Child Nursing.**

Supervised, individual clinical project. One lecture hour and eight laboratory hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**N 392P. Health Policy, Program Planning, and Evaluation.**

Open to all University graduate students. Exploration of multilevel health care policy implementation, program development, and outcome evaluation. Focus on the application of policies from macro-level to micro-level systems. Three lecture hours a week for one semester. Prerequisite: Graduate standing; and Nursing 392E or the equivalent, or consent of instructor.

**N 392Q. Advanced Psychosocial Nursing Care of Diverse Populations.**

Emphasizes current theoretical, research, ethical, and cultural perspectives critical to the application of advanced psychosocial nursing strategies to promote health of diverse populations of individuals, groups, and families. Two and one-half lecture hours a week and two laboratory hours a week for one semester. Prerequisite: Graduate standing.

**N 492S. Advanced Practicum in Parent-Child Nursing.**

Culminating preceptorship experience: each student identifies his or her objectives for refining the role of the advanced practice nurse and selects the clinical setting and target population(s) that best support those objectives. One lecture hour and twelve laboratory hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and credit or registration for Nursing 592U.

**N 392T. Advanced Assessment in Parent-Child Nursing.**

Advanced nursing assessment strategies for childbearing and childrearing families. One and one-half lecture hours and six laboratory hours a week for one semester. Prerequisite: Graduate standing.

**N 592U. Parent-Child Nursing III: At-Risk Families.**

Salient concepts and clinical basis for advanced nursing practice with at-risk families during the childbearing years. Legal, ethical, and practice issues affecting the advanced practice nurse. Emphasis is on assessment and intervention with pregnant women and children with health problems that have a social and biophysical etiology. Students apply concepts in providing nursing care to at-risk families in a variety of clinical settings under supervision of faculty members and preceptors. Three lecture hours and eight laboratory hours a week for one semester. Prerequisite: Graduate standing and Nursing 592L.

**N 192V, 392V. Advanced Pediatric Pathophysiology.**

Pathophysiology unique to the growth and development of newborns, infants, children, and adolescents. Embryology, genetics, adaptation to extrauterine life, congenital anomalies, immunology, and the physiology and pathophysiology of puberty. Pathophysiology is studied from a developmental perspective, to encourage students' in-depth understanding of functional and dysfunctional integration of organ systems in the developing human; the goal is to give students a foundation for assessing and intervening with a variety of childhood health conditions based on pathophysiological changes. For each semester hour of credit earned, one lecture hour a week for one semester. Prerequisite: Graduate standing.

**N 492W. Advanced Practicum in Child Health.**

Prominent concepts of biophysical, psychological, developmental, family, and sociocultural perspectives, and the clinical basis for master's-level nursing practice with children and their families. Students use advanced concepts and theories in working with faculty members and preceptors in hospitals, clinics, schools, or homes. Two lecture hours and eight clinical hours a week for one semester. Prerequisite: Graduate standing and Nursing 392V, 394C, and 396T.

**N 393. Parents, Children, and Family Life.**

Study of theories on parents, children, and family life; critical review of major research findings, with emphasis on implications for further

research. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

**N 393M. Maternal/Parent-Child Nursing.**

Class and/or laboratory hours to be arranged. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

**Topic 1: Seminar in Parenthood and Family Life.** Advanced seminar on theory and research related to parenthood and family life.

**Topic 3: Work and Family: Psychological and Social Aspects of Multiple Roles.** Advanced seminar focusing on occupational and parental roles and the resulting strains and health consequences.

**Topic 4: Predictive and Interventive Research with Families.** Advanced seminar reviewing, critiquing, and applying predictive and interventive research studies.

**N 293P. Pediatric Diagnostic Reasoning and Advanced Invasive Skills.**

Interpretation of laboratory and diagnostic testing; and the development of diagnostic and psychomotor skills needed to care for acute or critically ill neonatal and pediatric patients. One and one-half lecture hours and two laboratory hours a week for one semester. Prerequisite: Graduate standing, credit or registration for Nursing 394C or the equivalent, and credit or registration for Nursing 392V or the equivalent.

**N 393Q. Advanced Neonatal Nursing I.**

Assessment and implementation of advanced nursing care of the high-risk preterm neonate. Development of a critical, analytical approach to clinical decision making; provision of care within a family-centered and developmentally supportive context. Concepts related to advanced role development of nurse practitioners. Three lecture hours a week for one semester. Prerequisite: Graduate standing, credit or registration for Nursing 293P and 395D, concurrent enrollment in Nursing 293R, and consent of instructor.

**N 293R. Advanced Neonatal Nursing I--Clinic.**

Assessment and implementation of advanced nursing care of the high-risk preterm neonate. Development of a critical, analytical approach to clinical decision making; provision of care within a family-centered and developmentally supportive context. Concepts related to advanced role development of nurse practitioners. Eight clinical hours a week for one semester. Prerequisite: Graduate standing, concurrent enrollment in Nursing 393Q, and consent of instructor.

**N 393S. Advanced Neonatal Nursing II.**

Knowledge and skills needed to recognize and respond to emerging crises and organ system dysfunction or failure in full-term neonates with complex acute, critical, or chronic health conditions. Stabilizing the patient, minimizing complications, restoring maximum health potential through risk reduction, and providing family-centered care. Current research and evidence, theoretical models, and philosophies of care. Continued development of a critical, analytical approach to clinical decision making. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Nursing 393Q and 293R, concurrent enrollment in Nursing 293T, and consent of instructor.

**N 293T. Advanced Neonatal Nursing II--Clinic.**

Continued development of advanced clinical skills in the management of high-risk neonates. Students incorporate nursing theory, current research and evidence, and complex skills into the care of full-term neonates with acute, critical, or chronic health conditions. Integration, under supervision of faculty members and preceptors, of the neonatal nurse practitioner role in the care of high-risk neonates in neonatal intensive care, labor and delivery, and interhospital and intrahospital transport. Eight clinical hours

a week for one semester. Prerequisite: Graduate standing, concurrent enrollment in Nursing 393S, and consent of instructor.

### **N 393U. Advanced Neonatal Nursing III.**

Transition to home care and follow-up care for high-risk neonates and infants and their families. Synthesis of current research and evidence and theoretical concepts in nursing and the social and behavioral sciences that are relevant to care from admission to discharge. Continued development of a critical, analytical approach to clinical decision making. Advanced role development; legal, political, and ethical issues affecting nurse practitioner practice. Three lecture hours a week for one semester. Prerequisite: Graduate standing, Nursing 393S and 293T, and concurrent enrollment in Nursing 293V.

### **N 293V. Advanced Neonatal Nursing III--Clinic.**

Continued development of advanced clinical skills in the management of high-risk neonates and infants. Under the supervision of faculty members and preceptors, students incorporate nursing theory, current research and evidence, and complex skills into the care of neonates and infants from hospital admission to discharge to follow-up care in the community. Integration of knowledge and skills needed to care effectively and efficiently for neonates and infants whose life processes are assisted by or dependent on technological devices. Eight clinical hours a week for one semester. Prerequisite: Graduate standing, concurrent enrollment in Nursing 393U, and consent of instructor.

### **N 493W. Advanced Neonatal Nursing Practicum.**

Concentrated and supervised application of knowledge and skills gained in previous courses to the management of high-risk neonates and infants. Evaluation of patients presenting with complex health problems and of their families; development of comprehensive evidence-based management plans under the supervision of faculty members and preceptors. Sixteen clinical hours a week for one semester. Prerequisite: Graduate standing, Nursing 393U and 293V, and consent of instructor.

### **N 194, 294, 394, 494. Independent Study in Nursing.**

Detailed or in-depth study in a specific topic area. Topic and mode of study are agreed upon by student and instructor. One, two, three, or four lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **N 394C. Advanced Pediatric Health and Developmental Assessment.**

Advanced developmental and health assessment of children (newborn through adolescent). Emphasis is on theories and skills applicable to the assessment of children. Two lecture hours and four laboratory hours a week for one semester. Prerequisite: Graduate standing, admission to the pediatric nurse practitioner specialization, credit or registration for Nursing 192V and 396C, and consent of instructor.

### **N 294D. Primary Health Care of the Adolescent.**

Study of health promotion, anticipatory guidance, prevention of illness, and the assessment and management of illnesses commonly affecting adolescents. Adolescent health is discussed in a developmental context. Two lecture hours a week for one semester. Prerequisite: Graduate standing, admission to the pediatric nurse practitioner specialization, credit or registration for Nursing 394C or 396J, and consent of instructor.

### **N 394E. Pediatric Primary Health Care Concepts I.**

Study of health promotion, anticipatory guidance, prevention of illness, and the assessment and management of acute illnesses commonly affecting children. Concepts related to advanced role development of nurse practitioners. Three lecture hours a week for one semester. Prerequisite: For students in the pediatric nurse practitioner concentration, graduate standing and concurrent enrollment in Nursing 394F and 395D;

for others, graduate standing, Nursing 394C and 392V, concurrent enrollment in Nursing 394F, and consent of instructor.

### **N 194F, 394F. Pediatric Primary Health Care Concepts I Clinic.**

Clinical experience in primary care settings, focusing on health promotion and management of well-child care and acute illnesses commonly encountered in children. For 394F, twelve laboratory hours a week for one semester; for 194F, four laboratory hours a week for one semester. Prerequisite: For students in the pediatric nurse practitioner concentration, graduate standing and concurrent enrollment in Nursing 394E and 395D; for others, graduate standing, Nursing 394C and 392V, concurrent enrollment in Nursing 394E, and consent of instructor.

### **N 294H. Advanced Practicum in Maternity Nursing.**

Guided field experience in which the student applies advanced nursing concepts in a selected area of maternity care. Designed to provide students, under the direction of a clinical mentor, extensive clinical experience to integrate skills relevant to his or her selected professional role. One lecture hour and eight clinical hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing; Nursing 494G, and credit or registration for Nursing 394N.

### **N 294J. Pediatric Primary Health Care Concepts III.**

Primary care management of complex conditions in children. Additional emphasis on advanced role development of the pediatric nurse practitioner. Two lecture hours a week for one semester. Prerequisite: Graduate standing, admission to the pediatric nurse practitioner specialization, Nursing 394E and 394F, concurrent enrollment in Nursing 494K, and consent of instructor.

### **N 494K. Pediatric Primary Health Care Concepts III Clinic.**

Pediatric primary health care practicum in the advanced nursing management of the health of infants, children, and adolescents. Sixteen laboratory hours a week for one semester. Prerequisite: Graduate standing, admission to the pediatric nurse practitioner specialization, Nursing 396U and 396V, concurrent enrollment in Nursing 294J, and consent of instructor.

### **N 494L. Advanced Physiologic Concepts in Maternity Nursing.**

Advanced concepts related to the physiological, pharmacologic, and environmental adaptations during childbearing. Interpretation of relevant biopsychosocial data; research related to the physiologic and pharmacologic effects in reproductive health; foundation for nursing care to the maternal-newborn dyad in the family context. Three lecture hours and four clinical hours a week for one semester. Prerequisite: Graduate standing, and Nursing 394N and 396C.

### **N 394M. Health Promotion in Maternity Nursing.**

Analysis of concepts related to health promotion, illness prevention, and health disparities throughout the perinatal period (fertility, pregnancy, birth, newborn, lactation, and parenting). Theories and research related to psychosocial concepts, family, parenting, pre-conception, systems of care, and cultural perspectives for health promotion in reproductive health are examined. Investigates the application of theoretical principles and research evidence relating to the care of women and newborns in a variety of settings under faculty and preceptor supervision. Two lecture hours and four clinical practicum hours a week for one semester. Prerequisite: Graduate standing and credit or registration for Nursing 396C.

### **N 394N. High-Risk Maternity Nursing.**

Significant biopsychosocial concepts that serve as a basis for nursing practice in high-risk maternity care; knowledge needed to identify common

maternity complications; assessment and planning of evidence-based maternity care within the family context. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Nursing 394M.

#### **N 294P. Advanced Practicum in Maternity Nursing.**

Guided field experience in which the student applies advanced nursing concepts in a selected area of maternity care. Under the direction of a clinical mentor, the student obtains extensive clinical experience to integrate skills relevant to his or her selected professional role. One lecture hour and four clinical hours a week for one semester. Prerequisite: Graduate standing, Nursing 394M, and credit or registration for Nursing 394N.

#### **N 394Q. Pediatric Acute Care Management I.**

Designed to prepare students to recognize, interpret, and respond to emerging health crises and organ system dysfunction or failure in children with complex acute, critical, and chronic health conditions. Emphasizes patient stabilization, minimizing complications, restoring maximal health potential through risk reduction, and providing physical and psychosocial support to the patient and family. Acute, critical, and chronic disorders within selected physiological systems are explored from a developmental and multicultural perspective. Six lecture hours every other week for one semester. Prerequisite: Graduate standing, Nursing 394E and 194F, credit or registration for Nursing 293P and 395D, concurrent enrollment in Nursing 294R, and consent of instructor.

#### **N 294R. Pediatric Acute Care Management I: Clinical.**

Provides an opportunity for the beginner acute care pediatric nurse practitioner student to apply advanced knowledge of pathophysiology, pharmacology, current research and evidence, and diagnostic and psychomotor skills to caring for children with complex acute, critical, and chronic health conditions, and their families. Eight laboratory hours a week for one semester. Prerequisite: Graduate standing, concurrent enrollment in Nursing 394Q, and consent of instructor. Students must also have proof of current Pediatric Advanced Life Support (PALS) training from the American Heart Association.

#### **N 394S. Pediatric Acute Care Management II.**

Designed to prepare students to recognize, interpret, and respond to emerging health crises and organ system dysfunction or failure of physiological systems in children with complex acute, critical, and chronic health conditions. Emphasizes patient stabilization, minimizing complications, and restoring maximum health potential. Explores core concepts such as transport, complex discharge planning, rehabilitation, home care, and long-term care. Six lecture hours every other week for one semester. Prerequisite: Graduate standing, Nursing 394Q and 294R, concurrent enrollment in Nursing 294T, and consent of instructor.

#### **N 294T. Pediatric Acute Care Management II: Clinical.**

Designed to prepare students for clinical competence consistent with that of a beginner acute care pediatric nurse practitioner. Under the supervision of faculty and preceptors, students integrate advanced knowledge of pathophysiology, pharmacology, current research and evidence, and diagnostic and psychomotor skills to create comprehensive management plans for children with complex acute, critical, and chronic health conditions. Eight laboratory hours per week for one semester. Prerequisite: Graduate standing, concurrent enrollment in Nursing 394S, and consent of instructor. Students must also have proof of current Pediatric Advanced Life Support (PALS) training from the American Heart Association.

#### **N 594U. Pediatric Acute Care Advanced Practicum.**

Designed to prepare students to demonstrate the clinical competence of an advanced beginner acute care pediatric nurse practitioner. Under the supervision of faculty and preceptors, students have the opportunity to

make independent and interdependent decisions in managing emerging health crises and organ system dysfunction in children with a variety of complex acute, critical, and chronic health conditions. Students work in a variety of settings, including emergency departments, intensive care units, inpatient medical and surgical units, and subspecialty clinics. Explores the legal, political, and ethical issues affecting nurse practitioner practice. Twenty laboratory hours a week for one semester. Prerequisite: Graduate standing, Nursing 394S and 294T, and consent of instructor. Students must also have proof of current Pediatric Advanced Life Support (PALS) training from the American Heart Association.

#### **N 195, 295, 395, 495, 595, 695. Topics in Nursing.**

Areas of special interest. For each semester hour of credit earned, one lecture hour a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; some topics also require consent of instructor.

#### **Topic 2: Community Programs Evaluation.**

#### **N 395C. Clinical Pharmacology and Therapeutics.**

Application of pharmacologic and pharmacokinetic principles to drug therapy management in family primary care nursing. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **N 395D. Pediatric Clinical Pharmacology and Therapeutics.**

The study of pediatric pharmacotherapeutics, with emphasis on pharmacokinetics, pharmacodynamics, administration, and education. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of instructor.

#### **N 395E. Doctor of Nursing Practice Role.**

Restricted to students in the Doctor of Nursing Practice program. Explores the role of the Doctor of Nursing Practice in the broader healthcare environment along with the development and application of knowledge in advanced practice nursing roles. Emphasizes how knowledge is acquired, the theoretical underpinnings upon which nursing practice is based, and the application of knowledge to practice. Two lecture hours and four laboratory hours a week for a semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

#### **N 395F. Theoretical Foundations for Nursing Practice.**

Restricted to students in the Doctor of Nursing Practice program. Examines the nature of theory and theory development for nursing practice; the application of theory to practice, practice change, and scholarship are also explored. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

#### **N 395G. Translating Evidence into Nursing Practice.**

Restricted to students in the Doctor of Nursing Practice program. Methods for developing best practice protocols and putting them into action. Explores analytic and measurement methods to critically appraise literature, how to function as a consultant or in a collaborative research role, and participation in dissemination of evidence-based practice guidelines to improve healthcare outcomes. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

#### **N 395H. Health Promotion among Diverse Cultures.**

Analyzes the impact of social, cultural, and ecological factors of healthcare delivery on various population groups. Emphasizes the application of sociocultural diversity as well as theories and methods for analyzing healthcare phenomena within the context of advanced practice nursing roles. In the context of an ethical and legal framework, the social issues common among vulnerable populations will also be examined.



Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Nursing 395E, N395F, and N395G.

### **N 395J. Health Policy Development and Implementation.**

Explores the leadership role of nurses in health policy, including the socio-political and economic context of health, advocacy, policy development, analysis, and implementation at the local, state, national, and global levels. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing; Nursing 394E, 395F, and 395G.

### **N 395K. Leadership in Organizations and Systems.**

Explores leadership theory, organizational theory, philosophy, culture, structure, processes, information management, interdisciplinary communication, and other areas relevant to healthcare organizations. Examines the role of the Doctor of Nursing Practice nurse within the larger context of the health care system. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing; Nursing 394E, 395F, and 395G.

### **N 395L. Quality Improvement and Safety Principles and Methods.**

Provides an overview of the components of the quality improvement processes and quality improvement methodologies to promote safe patient outcomes. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing; Nursing 395E, 395F, and 395G.

### **N 395M. Epidemiology and Population Health.**

Explores in detail the roles of federal, state, and local governments in relationship to the core functions of public health. Health disparities and the needs of priority populations will also be analyzed. Health promotion models impacting specific populations and population-focused health initiatives will be evaluated. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing; Nursing 395E, 395F, and 395G.

### **N 395N. Biostatistics.**

Basic concepts in descriptive and inferential statistical methods. Explores intermediate statistical concepts including analysis of variance (ANOVA) with planned comparisons and post-hoc tests, factorial ANOVA, bivariate linear correlation and logistic and multiple regression, survival analysis, the chi-square tests for goodness of fit and association, the Mann-Whitney U test, and the essentials of sample size estimation. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing; Nursing 395E, 395F, and 395G.

### **N 395P. Health Care Economics.**

Explores basic economic theory, market drivers and restraints, health care budget, financial management and reimbursement, cost/benefit analysis, and healthcare entrepreneurialism. Includes theory and application, with a particular focus on the clinical role of the Doctor of Nursing Practice within the contemporary healthcare environment. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing; Nursing 395E, 395F, and 395G.

### **N 395S. Healthcare Information Systems.**

Employs multidisciplinary approaches to informatics by incorporating nursing science, computer science, and information science. Examines the resources and methods required to apply these technologies to clinical guidelines, communication systems and to enhance health care delivery. Opportunities to analyze information requirements, design system alternatives, and consider the management of resources is integrated in the course. Three lecture hours a week for one semester. Offered on the

letter-grade basis only. Prerequisite: Graduate standing; Nursing 395E, 395F, and 395G.

### **N 395T. DNP Clinical Leadership Specialization Seminar and Practicum I.**

Identification of a clinical leadership specialization interest by the Doctor of Nursing Practice student beginning in the second semester of the program. The clinical specialization focus includes identification of evidence-based strategies for implementing and achieving health care outcomes, such as a significant pilot study, a program evaluation project, a quality improvement project, a policy analysis, or a practice change initiative. The student is required to submit an individualized practicum proposal and objectives for the practicum experience. One lecture and eight laboratory hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing; Nursing 395E, 395F, and 395G.

### **N 395U. DNP Clinical Leadership Specialization Seminar and Practicum II.**

Examines the feasibility of implementing and achieving health care outcomes such as a significant pilot study, a program evaluation project, a quality improvement project, a policy analysis, or a practice change initiative in an identified area of clinical leadership specialization. The student is required to submit an individualized practicum proposal and objectives for the practicum experience. One lecture and eight laboratory hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing; Nursing 395E, 395F, 395G, and 395T.

### **N 395V. DNP Clinical Leadership Specialization Seminar and Practicum III.**

Implementation of a significant pilot study, a program evaluation project, a quality improvement project, a policy analysis, or a practice change initiative in an identified area of clinical leadership specialization. Implementation strategies include incorporation of the most recent evidence-based practice in the management of patient care within an interdisciplinary practice model, utilization of evidence-based research in the clinical management of individuals, families, and communities as well as experience in leadership and systems analysis in complex organizations, managing interdisciplinary teams, and developing and implementing quality improvement projects and evidence-based management systems to improve patient, population and health systems outcomes. The student is required to submit an individualized practicum proposal and objectives for the practicum experience. One lecture hour and eight laboratory hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing; Nursing 395E, 395F, 395G, and 395U.

### **N 395W. DNP Clinical Leadership Specialization Seminar and Practicum IV.**

Provides the opportunity for dissemination of outcomes such as those resulting from a significant pilot study, a program evaluation project, a quality improvement project, a policy analysis, or a practice change initiative in an identified area of clinical leadership specialization and serves as a foundation for future scholarly practice. The student is required to submit an individualized practicum proposal and objectives for the practicum experience. One lecture hour and eight laboratory hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing; Nursing 395E, 395F, 395G, and 395V.

### **N 396C. Advanced Pathophysiology.**

Pathophysiologic concepts from the cellular level through major body systems and across the life span. Etiological, pathogenic, and presenting patterns. Fundamental concepts of anatomy and physiology. Students are expected to develop an understanding of nursing and medical interventions for common health problems and the ability to apply and

design interventions based on pathophysiologic changes. Three lecture hours a week for one semester. Nursing 396C and Pharmacy 395D may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **N 396J. Advanced Health Assessment.**

Advanced knowledge and skills involved in the assessment of individuals throughout the life span, within the context of the family, to determine their health status. Two lecture hours, three laboratory hours, and one hour of skills laboratory a week for one semester. Prerequisite: Graduate standing, admission to the advanced practice specialization, credit or registration for Nursing 396C, and consent of instructor.

### **N 196K, 296K. Advanced Health Assessment Clinic.**

Application of health assessment concepts and skills under the supervision of faculty and clinical preceptors in the clinical area. Performance of systematic health assessments of adults leading to the identification of normal and abnormal findings and the development of an initial health status list. Four or eight laboratory hours a week for one semester. Prerequisite: Graduate standing, admission to the advanced practice specialization, credit or registration for Nursing 396C and 396J, and consent of instructor.

### **N 396L. Primary Health Care Concepts I.**

Theoretical and clinical knowledge needed for advanced nursing management within the context of the family and the community of individuals who are essentially well or who have minor health problems. Three lecture hours a week for one semester. Prerequisite: Graduate standing; admission to the family nurse practitioner or the pediatric nurse practitioner specialization; Nursing 396J and 296K; concurrent enrollment in Nursing 196M, 296M, or 396M; and consent of instructor.

### **N 196M, 296M, 396M. Primary Health Care Concepts I Clinic.**

Supervised experience in the nursing management of infants, children, and/or advanced adults and families who are well or who have common acute health problems. For each semester hour of credit earned, four laboratory hours a week for one semester. Prerequisite: Graduate standing; admission to the family nurse practitioner or the pediatric nurse practitioner specialization; Nursing 396C, 396J, and 296K; concurrent enrollment in Nursing 396L; and consent of instructor.

### **N 396N. Primary Health Care Concepts II.**

Theoretical and clinical knowledge needed for the management of complex and chronic health problems of individuals and families. Three lecture hours a week for one semester. Prerequisite: Graduate standing; admission to the family nurse practitioner specialization; Nursing 396L and 396M; concurrent enrollment in Nursing 196P, 296P, or 396P; and consent of instructor.

### **N 196P, 296P, 396P. Primary Health Care Concepts II Clinic.**

Supervised experience in the nursing management of infants, children, adults, and families who have complex or chronic health problems. For each semester hour of credit earned, four laboratory hours a week for one semester. Prerequisite: Graduate standing; admission to the family nurse practitioner specialization; Nursing 391D, 396L, and 396M; concurrent enrollment in Nursing 396N; and consent of instructor.

### **N 396Q. Primary Health Care Concepts III.**

Synthesis of concepts and theories from nursing, social sciences, and biological sciences that are related to primary health care management of members of families and communities. Three lecture hours a week for one semester. Prerequisite: Graduate standing; admission to the family nurse practitioner or the pediatric nurse practitioner specialization; Nursing 391E; either Nursing 396N and 396P or 396U and 396V; concurrent

enrollment in Nursing 196R, 296R, 396R, or 496R; and consent of instructor.

### **N 196R, 296R, 396R, 496R. Primary Health Care Concepts III Clinic.**

Advanced supervised experience as a direct primary health care giver in family practice clinical settings. For each semester hour of credit earned, four laboratory hours a week for one semester. Prerequisite: Graduate standing; admission to the family nurse practitioner or the pediatric nurse practitioner specialization; Nursing 391E; either Nursing 396N and 396P or 396U and 396V; concurrent enrollment in Nursing 396Q; and consent of instructor.

### **N 196S. Special Project in Advanced Practice.**

Development of a special project in an area of research, policy, or clinical issues relevant to advanced practice. Four laboratory hours a week for one semester. Prerequisite: Graduate standing, admission to the family nurse practitioner or the pediatric nurse practitioner specialization, Nursing 396L and 396M, and consent of instructor.

### **N 396T. Ecological Approaches to Child Health.**

The ecological approach to understanding individual, parental, family, and societal determinants of children's health. Students gain knowledge of developmental and family theories and use epidemiological principles to comprehend the complex dimensions and related conceptual factors that contribute to the health and well-being of children within families. Theoretical foundations for graduate students interested in health promotion and risk reduction for children and families. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **N 396U. Pediatric Primary Health Care Concepts II.**

Theoretical knowledge relevant to the management of complex and chronic primary health care problems from infancy through adolescence. Three lecture hours a week for one semester. Prerequisite: Graduate standing; admission to the pediatric nurse practitioner or the parent/child nursing specialization; Nursing 396C, 396L, and 396M; concurrent enrollment in Nursing 196V, 296V, or 396V; and consent of instructor.

### **N 196V, 296V, 396V. Pediatric Primary Health Care Concepts II Clinic.**

Clinical practice in the management of complex or chronic health problems of infants, children, and adolescents. For each semester hour of credit earned, four laboratory hours a week for one semester. Prerequisite: Graduate standing; admission to the pediatric nurse practitioner or the parent/child nursing specialization; Nursing 396C, 396L, and 396M; and concurrent enrollment in Nursing 396U.

### **N 396W. Advanced Adult Health Assessment.**

Introduces advanced knowledge and skills related to assessing the health of adult individuals. Emphasis is on combining nursing, biological, psychological, and sociocultural knowledge with theories of health and aging as they apply to the comprehensive assessment of client concerns and interpretation of clinical data relating to health promotion, health maintenance, and illness care. Two lecture hours, one skills laboratory hour, and three laboratory hours a week for one semester. Prerequisite: Graduate standing.

### **N 197C. Doctoral Seminar I.**

Introduction to nursing science. Explores the history, current priorities, and funding mechanisms of science development in nursing along with established programs of nursing research. Provides a forum for students to develop and exchange ideas regarding research topics. One lecture hour a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

### **N 197D. Doctoral Seminar II.**

One lecture hour a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, and Nursing 197C or consent of instructor.

### **N 397K. Advanced Research in Nursing.**

Nursing science methods for developing and testing theoretical formulations: experimental, descriptive, qualitative, and historical designs. Three lecture hours a week for one semester, with additional computer laboratory hours to be arranged. Required of all doctoral students. Prerequisite: Graduate standing, Nursing 392E, and consent of instructor.

### **N 397L. Nursing Research Methods.**

Three lecture hours a week for one semester, with additional computer laboratory hours to be arranged. May be repeated for credit when the topics vary. Prerequisite: Graduate standing, Nursing 397K, and consent of instructor.

**Topic 1: Analysis and Interpretation of Data.** Critiquing, interpreting, disseminating, and using research findings.

**Topic 2: Instrumentation and Measurement.** Theoretical, methodological, and procedural aspects of measurement: norm-referenced and criterion-referenced measurement; data management and instrumentation.

**Topic 3: Conceptual Foundations of Research Design and Methods.** Theoretical approach to basic statistical and measurement concepts and their importance to research in health-related areas.

**Topic 4: Critical Review of the Literature.** Designed to assist the novice researcher in conducting a systematic and critical review of the literature in a substantial area of health-related scholarship. Nursing 381M (Topic 2: Substantive Areas in Adult Health {Adult Health II}) and 397L (Topic 4) may not both be counted.

**Topic 5: Quantitative Design, Methods, and Analysis.** The quantitative research design, methods, and analyses used in health care research. Includes descriptive, correlational, and experimental designs; related methods of analyses using statistical software; and interpretation of data. Additional prerequisite: Nursing 397L (Topic 3) or consent of instructor.

### **N 397M. Qualitative Research.**

Introduction to the theoretical and methodological aspects of qualitative research methods. Qualitative research approaches from a variety of disciplines and philosophical traditions, with emphasis on the application of research designs and data collection and analysis techniques to nursing studies. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and completion of two doctoral-level research courses or consent of instructor.

### **N 197P, 297P. Nursing Research Practicum.**

Guided experience in conceptual and methodological aspects of research: data management and analysis; critique and interpretation; instrumentation; and measurement. Four or eight laboratory hours a week for one semester. May be repeated twice for credit. May be repeated for credit. Prerequisite: Graduate standing and Nursing 397K.

### **N 397Q. Research Practicum I.**

Examines essential aspects of the responsible conduct of research and beginning skills needed to initiate a research program. Students focus on conceptual, methodological, and practical aspects of research within an ongoing faculty research project. One and one-half lecture hours and six laboratory hours a week for one semester. Prerequisite: Graduate standing; and Nursing 397L (Topic 3: Conceptual Foundations of Research Design and Methods), or credit or registration for Nursing

397L (Topic 5: Quantitative Design, Methods, and Analysis), or consent of instructor.

### **N 397R. Research Practicum II.**

Examines essential procedural aspects of conducting health-related research. Students focus on conceptual, methodological, and practical aspects of research within an ongoing faculty research project. One and one-half lecture hours and six laboratory hours a week for one semester. Prerequisite: Graduate standing; Nursing 397L (Topic 3: Conceptual Foundations of Research Design and Methods), 397L (Topic 5: Quantitative Design, Methods, and Analysis), or consent of instructor; and credit or registration for Nursing 380M (Topic 4: Philosophical and Theoretical Bases of Nursing Science), 382, or consent of instructor.

### **N 397S. Research Practicum III.**

Focuses on essential skills needed to develop a research proposal and plan an independent research program. Students focus on conceptual, methodological, and practical aspects of research within an ongoing faculty research project. One and one-half lecture hours and six laboratory hours a week for one semester. Prerequisite: Graduate standing, and Nursing 397M and 397R.

### **N 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in nursing and consent of the graduate adviser; for 698B, Nursing 698A.

### **N 398T. Supervised Teaching and Learning in Nursing.**

Designed to introduce the student to the essential elements of nursing education prior to engaging in the role of assistant instructor. Critical elements include the theoretical bases of teaching and learning; teaching strategies for clinical and classroom settings; assessment and evaluation strategies for various educational settings; ethical and legal considerations; and the importance of engaging in the scholarship of teaching. Two lecture hours and four laboratory hours a week for one semester. Prerequisite: Graduate standing.

### **N 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Completion of core doctoral courses and admission to candidacy for the doctoral degree.

### **N 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Nursing 399R, 699R, or 999R.

## **College of Pharmacy**

## **Pharmaceutical Sciences**

*Master of Science in Pharmaceutical Sciences  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Pharmacy Building (PHR) 4.220, phone (512) 471-6590, fax (512) 471-4066; campus mail code: A1900

**Mailing address:** The University of Texas at Austin, Graduate Program, College of Pharmacy, 2409 University Avenue Stop A1900, Austin TX 78712

**E-mail:** [swcrouch@austin.utexas.edu](mailto:swcrouch@austin.utexas.edu)

**URL:** <http://www.utexas.edu/pharmacy/edutrain/graduate.html>

## Facilities for Graduate Work

State-of-the-art research facilities are available for graduate education. Laboratories are equipped with the latest instrumentation and specialized support units for research in all of the areas of study mentioned below. Research space on the Austin campus is located in two pharmacy buildings, the Biomedical Engineering Building, the Dell Pediatric Research Institute, and in the Animal Resources Center. In San Antonio, basic laboratory and clinical research space is available in the McDermott Building on the campus of the University of Texas Health Science Center, and at affiliated institutions. Laboratories and offices on both campuses are outfitted with wired and wireless connections for Internet and library access. Additional facilities for collaborative research in Austin are available in the College of Natural Sciences, the Cockrell School of Engineering, the Institute for Neuroscience, and the Institute for Cellular and Molecular Biology. Students in both Austin and San Antonio have access to extensive electronic journal holdings through the University Libraries Web site (<http://www.lib.utexas.edu>).

**Drug Dynamics Institute.** The Drug Dynamics Institute (<http://www.utexas.edu/pharmacy/research/interdis/ddi>) is a graduate and postdoctoral research training center where educators, students, scientists, business people, and government officials come together to share common interests in a wide range of biomedical, pharmaceutical, and public health problems. The mission of the institute is the discovery and communication of scientific and technological knowledge in drug development, manufacturing, marketing, and therapy. Projects in pharmacokinetics and drug metabolism, industrial pharmacy and technology, pharmacology and toxicology, and clinical pharmacy are currently under way.

**Center for Pharmacoeconomic Studies.** The center (<http://www.utexas.edu/pharmacy/research/institutes/pharmacoeconomics>) combines the skills of experts in clinical pharmacy, pharmacoeconomics, management, and marketing to examine the impact of pharmaceutical products and pharmacy services on patients' quality of life and health care outcomes. The center's researchers and graduate students provide research design, data collection, and data analysis expertise to health care providers, the pharmaceutical industry, health care payers, insurers, and health care institutions and organizations. Center personnel also develop, present, and support educational programs to further public understanding of pharmacoeconomics.

**Center for Molecular and Cellular Toxicology.** The University of Texas at Austin has established an interdisciplinary Center for Molecular and Cellular Toxicology (<http://www.utexas.edu/pharmacy/cmct>) (CMCT). The mission of the CMCT is to provide leadership for the expansion of programs in environmental health sciences education and research. The CMCT is supported by the College of Pharmacy and also involves faculty in the College of Natural Sciences and the University of Texas M. D. Anderson Cancer Center, Department of Carcinogenesis, located in Smithville, Texas, about forty miles east of Austin.

The CMCT fosters interdisciplinary graduate training programs by providing the mechanism by which students can work with a range of faculty interested in toxicology. This includes facilitating interdisciplinary research collaborations and providing ancillary student and research infrastructure support. The center's faculty represent a wide variety of scientific disciplines, including pharmacology, toxicology, medicinal chemistry, pharmaceuticals, neuroscience, nutrition, biochemistry, chemistry, marine biology, and civil and mechanical engineering.

**Addiction Science Research and Education Center (ASREC).** The mission of this center (<http://www.utexas.edu/research/asrec>) is to communicate the latest findings in addiction science to the public in terms that make the message easy to understand. University researchers in this

dynamic area have been trained to communicate the latest findings in the field to a diverse audience, including addiction treatment professionals, medical personnel, social workers, psychologists, law enforcement personnel, teachers, students, and the general public.

**The Center for Advancement of Research and Education in Infectious Diseases (CARE-ID).** The mission of this center ([https://www.utexas.edu/research/eureka/institution/view?institution\\_id=125](https://www.utexas.edu/research/eureka/institution/view?institution_id=125)) is to conduct collaborative and interdisciplinary laboratory-based, translational, and clinical research for infectious diseases; foster clinical and graduate research training in infectious diseases; and enhance the knowledge of health care providers and the public about infectious diseases. Researchers include faculty members from the University of Texas at Austin, the University of Texas Health Science Center at San Antonio, University Health System in San Antonio, and the South Texas Veterans Health Care System. The center serves as the training center in infectious disease research for PharmD students, residents, fellows, and graduate students.

Additional collaborative research is conducted between pharmacy faculty members and members of research institutes and centers across campus, including the Institute for Cellular and Molecular Biology, the Institute for Neuroscience, and the Waggoner Center for Alcohol and Addiction Research.

## Areas of Study

The College of Pharmacy offers graduate study leading to the Master of Science in Pharmaceutical Sciences and the Doctor of Philosophy with a major in pharmaceutical sciences. Areas of specialization are: medicinal chemistry, including synthetic or bioorganic chemistry and structural molecular biology subspecializations; pharmacology and toxicology; pharmaceuticals, including physical pharmacy, biopharmaceutics, drug delivery and pharmaceuticals, and industrial pharmacy; pharmacy administration, including pharmacy practice and pharmacoeconomics; and pharmacotherapy. Students pursuing either the Master of Science or the Doctor of Philosophy who hold a PharmD degree from a pharmacy program accredited by the Accreditation Council for Pharmacy Education have opportunities for advanced practice training. They may complete a specialty practice residency while pursuing the graduate degree. More information is available from the graduate adviser.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Jamie C Barner  
Carolyn M Brown  
M Lynn Crismon  
Maria A Croyle  
Zhengrong Cui  
Kevin N Dalby  
Patrick J Davis  
John Digiovanni  
Christine L Duvauchelle  
Carlton K Erickson  
Walter L Fast  
Kentya C Ford  
Christopher R Frei  
Debadyuti Ghosh  
Rueben A Gonzales  
Andrea C Gore  
R A Harris  
Sean M Kerwin  
Dawit Kidane-Mulat  
Jim M Koeller  
Yui-Wing F Lam  
Kenneth A Lawson  
Seongmin Lee

Steven W Leslie  
Hung-Wen Liu  
Michela Marinelli  
Robert Messing  
S J Mihic  
Edward M Mills  
Richard A Morrisett  
Somshuvra Mukhopadhyay  
Karen L Rascati  
Kelly Renee Reveles  
John H Richburg  
Stephen R Saklad  
Marvin D Shepherd  
Hugh D Smyth  
Salomon A Stavchansky  
Carla L Vandenberg  
Karen Marie Vasquez  
Christian P Whitman  
Richard E Wilcox  
Robert O Williams III  
James P Wilson  
Casey W Wright  
Feng Zhang

## Admission Requirements

The applicant should have a bachelor's degree in pharmaceutical sciences, biology, chemistry, or a related field, or a professional pharmacy degree from an accredited institution in the United States or another country. Students are admitted to the program upon recommendation of the Graduate Studies Committee, provided that their undergraduate training includes appropriate work in fields related to the pharmaceutical and health sciences. Applicants without the appropriate background may be required to complete additional coursework after admission. For some areas of study, preference is given to students who have a Doctor of Pharmacy degree from a college accredited by the Accreditation Council for Pharmacy Education. Preference is also given to applicants for the doctoral degree.

## Degree Requirements

Pharmacy Graduate Studies 196S, *Seminar in Pharmacy* is required of all graduate students in pharmacy and is taught every semester in each division. This requirement may be waived for a specific semester by the Graduate Studies Committee for sufficient reason upon petition by the student's major professor. No more than two semester hours of credit earned in this course are counted toward the number of hours required in master's degree programs.

**Master of Science in Pharmaceutical Sciences.** The Master of Science in Pharmaceutical Sciences is offered with a specialization in administration; it is also offered with residency training in pharmacotherapy or pharmacy practice. Consult the pharmacy Web site (<http://www.utexas.edu/pharmacy/edutrain/graduate.html>) for degree requirements and additional information.

**Doctor of Philosophy.** The student selects a major professor who will supervise the qualifying examinations, act as chair of the dissertation committee, and assist with selection of suitable dissertation committee members. Upon completion of the qualifying examinations, the student meets with the Administrative Subcommittee of the Graduate Studies Committee and the graduate adviser, who then recommends to the graduate dean whether the student should be admitted to doctoral candidacy. After admission to doctoral candidacy, the student must enroll in the dissertation course each fall and spring semester.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Pharmacy Graduate Studies: PGS

#### PGS 380F. Biomedical Pharmacology I.

Basic neurotransmission and pharmacological principles. Physiological effects of drugs used in disease states including neurological, cardiovascular, psychiatric disorders, and pain relief. Three lecture hours a week for one semester. Only one of the following may be counted: Neuroscience 380F, Pharmacy 380F, 480F, Pharmacy Graduate Studies 380F. Offered on the letter-grade basis only. Prerequisite: Graduate standing and experience or prior coursework in physiology, biochemistry, or organic chemistry.

#### PGS 380G. Biomedical Pharmacology II.

Fundamental concepts of pharmacology, including molecular mechanisms of drug action, absorption, distribution and elimination, tolerance, dependence, mutagenesis, teratogenesis, and carcinogenesis. Three lecture hours a week for one semester. Pharmacy 380N, 480N, and Pharmacy Graduate Studies 380G may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing; and Pharmacy 480F (or 380F), Pharmacy Graduate Studies 380F, or consent of instructor.

#### PGS 180J, 280J, 380J. Advanced Pharmaceutics: Laboratory Research.

Three, six, or nine laboratory hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

#### PGS 180M, 280M, 380M. Advanced Pharmaceutics.

For each semester hour of credit earned, one lecture hour a week for one semester. Pharmacy 180M, 280M, 380M and Pharmacy Graduate Studies 180M, 280M, 380M may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

#### PGS 380S. Basic Principles in Experimental Design and Statistics.

Basic principles in experimental design and statistics with a focus on real world situations that may be encountered while performing scientific research. Overview of the effective presentation of statistical results, displaying professionalism, and communication skills. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

#### PGS 380T. Texas Venture Labs Startup Practicum.

Places students in teams and connects them with Austin-area startup companies. The teams then execute business consulting projects for the startup companies. Explores how these projects help companies better understand their market, competition, business model, etc, in order to accelerate their path to market and funding decisions. Three lecture hours a week for one semester. Only one of the following may be counted: Aerospace Engineering 396 (Topic: Texas Venture Labs Practicum), Electrical Engineering 390V (Topic: Texas Venture Labs Practicum), Engineering Mechanics 397 (Topic: Texas Venture Labs Practicum), Management 385 (Topic: Texas Venture Labs Practicum), Mechanical

Engineering 397 (Topic: Texas Venture Labs Practicum), Pharmacy Graduate Studies 380M (Topic: Texas Venture Labs Startup Practicum). Prerequisite: Graduate standing.

### **PGS 381F. Product Development.**

Application of physical-chemical principles to the formulation and development of stable and bioavailable drug delivery systems. Three lecture hours a week for one semester. Pharmacy 381D and Pharmacy Graduate Studies 381F may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing in the College of Pharmacy, or consent of instructor.

### **PGS 381G. Advanced Manufacturing Pharmacy.**

Physical-mechanical properties of compacts, drugs, and polymers. Properties of biodegradable and nonbiodegradable polymers in pharmaceutical formulations. Process validation and pilot plant scale-up. Three lecture hours a week for one semester. Pharmacy 381G and Pharmacy Graduate Studies 381G may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing in the College of Pharmacy, or consent of instructor.

### **PGS 381H. Advanced Pharmaceutical Processing.**

Didactic and laboratory exposure to pharmaceutical processes used in the design, development, and optimization of drug delivery systems. Emphasis on equipment and machinery used in pharmaceutical manufacturing of these dosage forms, with discussion of other issues, such as technology transfer and scale-up. Three lecture hours a week for one semester. Pharmacy 380Q and Pharmacy Graduate Studies 381H may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing in the College of Pharmacy, or consent of instructor.

### **PGS 181J, 281J, 381J. Advanced Pharmacy Administration: Laboratory Research.**

Three, six, or nine laboratory hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **PGS 181M, 281M, 381M. Advanced Pharmacy Administration.**

For each semester hour of credit earned, one lecture hour a week for one semester. Pharmacy 181M, 281M, 381M and Pharmacy Graduate Studies 181M, 281M, 381M may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

### **PGS 381N. Health Care Systems.**

Overview of the health care system in the United States and examination of the classic and contemporary literature on managed health care systems, with emphasis on pharmacy-related issues. Studies the advantages, disadvantages, and effects of these systems on patients, providers, and payers. Three lecture hours a week for one semester. Pharmacy 381N and Pharmacy Graduate Studies 381N may not both be counted. Prerequisite: Graduate standing.

### **PGS 381V. Communication Skills for Translational Scientists.**

Explores oral and written communication skills for scientists conducting translational research at the interface of basic and clinical science. Introduction to the skills necessary to successfully convey medication and healthcare-related data in a professional manner. Involves discussions addressing subjects such as medical writing, grant writing, abstract development, and poster design. Three lecture hours a week for one semester Pharmacy 381V and Pharmacy Graduate Studies 381V may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **PGS 381W. Molecular and Pharmacological Basis of Therapeutics.**

Broad issues of molecular pharmacotherapeutics, including potential and challenge for optimization of drug therapy, implications for drug development and regulation, ethical and social aspects of pharmacogenomics, signal transduction, use of knock-out mice, and informed consent process in pharmacogenomic research. Three lecture hours a week for one semester. Pharmacy 381W and Pharmacy Graduate Studies 381W may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

### **PGS 282J. Advanced Pharmacotherapy Seminar I.**

Discussion of advanced pharmacotherapeutics topics, case presentations, and journal clubs at the advanced practitioner level. Two lecture hours a week for one semester. Pharmacy 282JA and Pharmacy Graduate Studies 282J may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **PGS 282K. Advanced Pharmacotherapy Seminar II.**

Discussion of advanced pharmacotherapeutics topics, case presentations, and journal clubs at the advanced practitioner level. Two lecture hours a week for one semester. Pharmacy 282JB and Pharmacy Graduate Studies 282K may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **PGS 382R. Recent Advanced in Pharmaceutics.**

Presentation of topics of current research interest in physical pharmacy, biopharmaceutics, and pharmacokinetics. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **PGS 282S, 382S. Advanced Biopharmaceutics.**

Provides students with a more comprehensive background in biopharmaceutics and the drug approval process. For each semester hour of credit earned, one lecture hour a week for one semester. Only one of the following may be counted: Pharmacy 382S, Pharmacy Graduate Studies 280M (Topic: Advanced Biopharmaceutics), 282S, 382S. Prerequisite: Graduate standing or consent of instructor.

### **PGS 382T. Basic Concepts of Tumor Biology.**

A survey of cancer biology that includes tumor pathology, initiation, progression and metastasis, genetic instability, DNA damage and repair, cell cycle control, oncogenes, tumor suppressor genes, and the immune response. Three lecture hours a week for one semester. Pharmacy 388K (Topic: Basic Concepts of Tumor Biology) and Pharmacy Graduate Studies 382T may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **PGS 382V. Pharmaceutical Biotechnology.**

Application of protein, oligonucleotide, and related molecules as therapeutic agents: stability, formulation, kinetics, dynamics. Three lecture hours a week for one semester. Pharmacy 382V and Pharmacy Graduate Studies 382V may not both be counted. Prerequisite: Graduate standing; and the following coursework: Chemistry 339K, Pharmacy 342C, 142P, 252C, 171P, and 371S, or the equivalent; or consent of instructor.

### **PGS 182W. Ethics in Science and Clinical Practice.**

Ethical considerations in the conduct of clinical research, including institutional review boards, adherence to protocol, Food and Drug Administration and related site reviews, protection of human subjects through informed consent and confidentiality, and the use of genetic banks in research. One lecture hour a week for one semester. Pharmacy 182W and Pharmacy Graduate Studies 182W may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **PGS 383D. Neuropharmacology.**

An advanced survey of neurotransmitters and systems in the brain. Covers experimental approaches and pharmacological analysis at behavioral, neurochemical, and neuroanatomical levels to determine mechanisms of actions of drugs that act on the brain. Three lecture hours a week for one semester. Only one of the following may be counted: Neuroscience 383D, Pharmacy 383D, Pharmacy Graduate Studies 383D. Prerequisite: Graduate standing and consent of instructor.

### **PGS 383N. Solution Theory and Disperse Systems.**

The theory and technology of solutions and heterogeneous systems; applications of scientific principles to the design of pharmaceutical products; a study of factors influencing physical chemical characteristics, stability, and biopharmaceutical activity of solutions and coarse dispersions; review of recent literature. Three lecture hours a week for one semester. Pharmacy 383N and Pharmacy Graduate Studies 383N may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **PGS 383P. Advanced Pharmacokinetics.**

Study of the kinetics of absorption, distribution, metabolism, and excretion of drugs in the intact organism. Three lecture hours a week for one semester. Pharmacy 383P and Pharmacy Graduate Studies 383P may not both be counted. Prerequisite: Graduate standing, and Pharmacy 252C or an equivalent pharmacokinetics course.

### **PGS 383Q. Statistics in Translational Science.**

Pharmaceutical statistical analysis with a focus on choosing the appropriate statistical test to address both basic science and clinical research hypotheses. Students use the JMP 7 software package to execute statistical analysis on their own pharmaceutical research projects. Three lecture hours a week for one semester. Pharmacy 383Q and Pharmacy Graduate Studies 383Q may not both be counted. Prerequisite: Graduate standing in the College of Pharmacy, and an introductory statistics course or consent of instructor.

### **PGS 383R. Rate Processes in Pharmaceutical Systems.**

A study of decomposition and stabilization of drug molecules in solutions and in solid dosage forms; principles of kinetics and diffusion as applied to pharmaceutical systems. Three lecture hours a week for one semester. Pharmacy 383R and Pharmacy Graduate Studies 383R may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **PGS 383V. Research Design and Methods.**

A practical approach to classical and experimental design. Hypothesis generation, experimental design that uses translational research methods (such as incorporating basic and clinical science), grantsmanship, and protocol development. Three lecture hours a week for one semester. Pharmacy 383V and Pharmacy Graduate Studies 383V may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **PGS 383W. Biopharmaceutical Analysis.**

Analytical methods for the isolation and identification of drugs and their metabolites, specific genes, and proteins in biological fluids. Three lecture hours a week for one semester. Pharmacy 383W and Pharmacy Graduate Studies 383W may not both be counted. Prerequisite: Graduate standing in pharmacy, completion of a PharmD degree, and concurrent enrollment in Pharmacy Graduate Studies 184U.

### **PGS 384K. Fundamentals of Toxicology.**

An organ system approach to advanced topics in general toxicology. Three lecture hours a week for one semester. Required course for pharmacology and toxicology graduate students specializing in toxicology. Pharmacy 384K and Pharmacy Graduate Studies 384K may not both be

counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing, and some background in pharmacology or consent of instructor.

### **PGS 384L. Biochemical and Molecular Toxicology.**

Discussion of mechanisms of selected drugs and toxicants. Three lecture hours a week for one semester. Pharmacy 390N and Pharmacy Graduate Studies 384L may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing, and some background in pharmacology or consent of instructor.

### **PGS 384N. Health Behavior Theory and Medication Use Process.**

In-depth analysis of the social and behavioral issues that affect medication use, using the content, theories, and methodologies associated with patient compliance research. Three lecture hours a week for one semester. Pharmacy 384N and Pharmacy Graduate Studies 384N may not both be counted. Prerequisite: Graduate standing.

### **PGS 384S. Introduction to Epidemiology.**

Principles of epidemiology; descriptive analytic, and clinical epidemiology; epidemiologic perspective for health care management; epidemiology and the public policy process; pharmacoepidemiology. Three lecture hours a week for one semester. Pharmacy 384S and Pharmacy Graduate Studies 384S may not both be counted. Prerequisite: Graduate standing; with consent of instructor, may be taken by students in the professional pharmacy curriculum.

### **PGS 384T. Advanced Epidemiology.**

Review of major research methods and current issues within drug epidemiology. Emphasis on application of methods by reviewing historical and contemporary literature/examples. Areas presented include: how to read, interpret, design, conduct, review, critique and evaluate pharmacoepidemiology studies. Three lecture hours a week for one semester. Pharmacy 381M (Topic: Advanced Epidemiology) and Pharmacy Graduate Studies 384T may not both be counted. Prerequisite: Graduate standing, and Pharmacy Graduate Studies 384S (or Pharmacy 384S) or consent of instructor.

### **PGS 184U. Biopharmaceutical Analysis Laboratory.**

Analytical methods for the isolation and identification of drugs and their metabolites, specific genes, and proteins in biological fluids. One lecture hour and three laboratory hours a week for one semester. Pharmacy 184U and Pharmacy Graduate Studies 184U may not both be counted. Prerequisite: Graduate standing in pharmacy, registration for Pharmacy Graduate Studies 383W, and completion of a PharmD degree.

### **PGS 185D. Responsible Conduct of Science.**

Ethical considerations in the conduct of science, including issues of animal welfare and/or human subjects research, data analysis, fraud, publications, misconduct, intellectual property, grants, peer review, and mentor responsibility. One lecture hour a week for one semester. Only one of the following may be counted: Neuroscience 185D, Pharmacy 185D, Pharmacy Graduate Studies 185D. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and admission to the doctoral program in pharmacy, or consent of instructor.

### **PGS 185G. Grant Writing for Pharmacology and Toxicology.**

Subjects include federal and nonfederal grants, specific aims, preliminary data, hypothesis testing, experimental design, peer review, responding to critiques, biosketch, and budgeting. One lecture hour a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in the pharmacology and toxicology program or consent of instructor.

**PGS 185J, 285J, 385J. Advanced Pharmacotherapy Laboratory Research.**

Three, six, or nine laboratory hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

**PGS 385L. Clinical Pharmacokinetics.**

In-depth analysis of pharmacotherapeutic regimens, using complex mathematical models. Three lecture hours a week for one semester. Pharmacy 385L and Pharmacy Graduate Studies 385L may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

**PGS 385M. Advanced Pharmacokinetics and Pharmacodynamics.**

Continuation of Pharmacy Graduate Studies 385L. Advanced pharmacokinetic and pharmacodynamic concepts and their application. Three lecture hours a week for one semester. Pharmacy 385M and Pharmacy Graduate Studies 385M may not both be counted. Prerequisite: Graduate standing, Pharmacy Graduate Studies 385L (or Pharmacy 385L), and consent of instructor.

**PGS 185W, 285W, 385W. Advanced Topics in Pharmacotherapy.**

One, two, or three lecture hours a week for one semester. Pharmacy 185W and Pharmacy Graduate Studies 185W, 285W, 385W may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor; additional prerequisites vary with the topic.

**PGS 386C. Cellular and Systems Physiology I.**

Basic principles of human physiology and anatomy in relation to drug action. Includes cellular and subcellular physiology, membrane transport, electrophysiology, synaptic transmission, and autonomic, neurological, and cardiovascular physiology and anatomy. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing in the Institute for Cellular and Molecular Biology, the Institute for Neuroscience, pharmacy, or psychology; and a year of undergraduate coursework in both general biology and chemistry.

**PGS 386D. Cellular and Systems Physiology II.**

Principles of cellular and systems physiology. Subjects include immunology, kidney function, respiration, acid-base balance, blood and hematopoiesis, general endocrinology, neuroendocrinology, and reproduction. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing, and Pharmacy Graduate Studies 386C or consent of instructor.

**PGS 186J, 286J, 386J. Advanced Medicinal Chemistry: Laboratory Research.**

Modern laboratory techniques used in medicinal and natural products chemistry. Three, six, or nine laboratory hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

**PGS 186K, 286K, 386K. Advanced Medicinal Chemistry.**

For each semester hour of credit earned, one lecture hour a week for one semester. Pharmacy 186K, 286K, 386K and Pharmacy Graduate Studies 186K, 286K, 386K may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

**PGS 386M. Pharmaceutical Industry and Marketing.**

Subjects include the structure, size, and regulation of the pharmaceutical industry, including good manufacturing practices; drug development,

pricing, marketing, and channels of distribution; and issues that impact the drug development industry, including generic drug competition, patent life, active ingredient importation and finished drug product importation, drug counterfeiting and safety concerns, direct-to-consumer advertising, and the drug approval process. Three lecture hours a week for one semester. Pharmacy 386M and Pharmacy Graduate Studies 386M may not both be counted. Prerequisite: Graduate standing and consent of instructor.

**PGS 186N, 286N, 386N, 486N. Topics in Pharmacy.**

Current issues in translational science. For each semester hour of credit earned, one lecture hour a week for one semester. Pharmacy 186N, 286N, 386N, 486N and Pharmacy Graduate Studies 186N, 286N, 386N, 486N may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and admission to the Doctor of Philosophy in Translational Science degree program; additional prerequisites vary with the topic.

**PGS 487Q. Communication Skills for Scientists.**

Designed to enhance written and oral communication skills through lectures and practice. Covers grant writing, journal paper writing, poster presentation writing, and delivery. Four lecture hours a week for one semester. Pharmacy 487Q and Pharmacy Graduate Studies 487Q may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing in pharmacy, neuroscience, or a biological science; additional prerequisite for international students: completion of the University's English Certification Program or consent of instructor.

**PGS 388C. Introductory Bioorganic Chemistry.**

Survey of enzyme-catalyzed reactions, with emphasis on mechanism, experimental design, and applications in natural products biosynthesis. Three lecture hours a week for one semester. Pharmacy 388C and Pharmacy Graduate Studies 388C may not both be counted. Prerequisite: Graduate standing, and undergraduate courses in organic chemistry and biochemistry or consent of instructor.

**PGS 188J, 288J, 388J. Advanced Pharmacology: Laboratory Research.**

Three, six, or nine laboratory hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

**PGS 188K, 288K, 388K. Advanced Pharmacology.**

For each semester hour of credit earned, one lecture hour a week for one semester. Pharmacy 188K, 288K, 388K and Pharmacy Graduate Studies 188K, 288K, 388K may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor; additional prerequisites vary with the topic.

**PGS 389C. Pharmacy Association Management.**

An introduction to the principles involved in managing pharmacy associations. Nine hours of fieldwork a week for one semester. Only one of the following may be counted: Pharmacy 329C, 389C, Pharmacy Graduate Studies 389C. Prerequisite: Graduate standing and consent of instructor.

**PGS 389J. Advanced Pharmacotherapeutics of Cardiovascular Disorders.**

Designed to provide the student with a sound knowledge and comprehension of contemporary pharmacotherapeutic regimens used in treating cardiovascular diseases. Three lecture hours a week for one semester. Pharmacy 389J and Pharmacy Graduate Studies 389J may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.



### **PGS 389P. Advanced Pharmacotherapeutics of Infectious Diseases.**

Designed to provide the student with a sound knowledge and comprehension of contemporary therapeutic principles used in treating infectious diseases. Three lecture hours a week for one semester. Pharmacy 389P and Pharmacy Graduate Studies 389P may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

### **PGS 189Q. Seminar in Alcohol Studies.**

Presentations and discussion of current research topics in alcohol studies. One lecture hour a week for one semester. Pharmacy 189Q and Pharmacy Graduate Studies 189Q may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **PGS 190G, 290G, 390G. Advanced Pharmacotherapeutics of Human Diseases and Illnesses.**

A comprehensive analysis of disease processes and a determination of appropriate therapeutic interventions for the treatment of those diseases. For each semester hour of credit earned, one lecture hour a week for one semester. Pharmacy 190G, 290G, 390G, 490G and Pharmacy Graduate Studies 190G, 290G, 390G, 490G may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor; additional prerequisites vary with the topic.

### **PGS 190H. Advanced Pharmaceutics Research Conference.**

One lecture hour a week for one semester. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **PGS 390J. Data Analysis in Health Care.**

Statistical analysis of research data using the computer and various statistical software programs. Three lecture hours a week for one semester. Pharmacy 390J and Pharmacy Graduate Studies 390J may not both be counted. Prerequisite: Graduate standing, and an introductory course in statistics or consent of instructor.

### **PGS 390K. Experimental Design and Research Methodology in Health Care.**

Principles and procedures of experimental, quasi-experimental, and non-experimental research designs; includes reliability, validity, data collection methods, qualitative study designs, and survey methodologies. Three lecture hours a week for one semester. Pharmacy 390K and Pharmacy Graduate Studies 390K may not both be counted. Prerequisite: Graduate standing.

### **PGS 190R, 290R, 390R. Special Problems in Pharmacotherapy.**

Individual supervision of research problems in the clinical pharmacy sciences, including pharmacokinetics, pharmacodynamics, efficacy, safety, and pharmaceutical care. Three, six, or nine laboratory hours a week for one semester. Pharmacy 190R, 290R, 390R and Pharmacy Graduate Studies 190R, 290R, 390R may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor; additional prerequisites vary with the topic.

### **PGS 390U. Advanced Research Methods in Health Care.**

Advanced methodologies used in pharmacy administration research; designed to build upon the skills covered in Pharmacy 390K. Explores data management issues and statistical procedures, with emphasis on the application of research methodology concepts and principles. Three lecture hours a week for one semester. Pharmacy 390U and Pharmacy

Graduate Studies 390U may not both be counted. Prerequisite: Graduate standing and Pharmacy Graduate Studies 390K (or Pharmacy 390K).

### **PGS 291E. Advanced Hematology and Oncology Seminar I.**

In-depth discussion of the contemporary pharmacotherapy and patient care relating to hematology, oncology, and bone marrow transplantation. Two lecture hours a week for one semester. Pharmacy 491GA and Pharmacy Graduate Studies 291E may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **PGS 291F. Advanced Hematology and Oncology Seminar II.**

In-depth discussion of the contemporary pharmacotherapy and patient care relating to hematology, oncology, and bone marrow transplantation. Two lecture hours a week for one semester. Pharmacy 491GB and Pharmacy Graduate Studies 291F may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **PGS 191H. Advanced Health Outcomes and Pharmacy Practice Research Conference.**

One lecture hour a week for one semester. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **PGS 191Q. Pharmacy and Its Disciplines.**

An overview of pharmacy and its primary disciplines of pharmaceutics, medicinal chemistry, pharmacy administration and practice, pharmacotherapy, and pharmacology/toxicology. One lecture hour a week for one semester. Pharmacy 191Q and Pharmacy Graduate Studies 191Q may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **PGS 292E. Clinical Research Methods I.**

Defining a research question, general study design issues, cross-sectional and case-control studies, and diagnostic test evaluation. Two lecture hours a week for one semester. Pharmacy 292E and Pharmacy Graduate Studies 292E may not both be counted. Prerequisite: Graduate standing.

### **PGS 292F. Clinical Research Methods II.**

Prospective observational studies; randomized controlled trials, nonrandomized intervention studies; meta-analysis; and data synthesis, evaluation, and application. Two lecture hours a week for one semester. Pharmacy 292F and Pharmacy Graduate Studies 292F may not both be counted. Prerequisite: Graduate standing; and Pharmacy Graduate Studies 292E (or Pharmacy 292E) or consent of instructor.

### **PGS 092T. Joint PhD Program with Partner Institutions.**

Translational science study at partner institutions. May not be taken concurrently with another course at the University of Texas at Austin. May be repeated for credit. Prerequisite: Graduate standing and admission to the Doctor of Philosophy in Translational Science degree program.

### **PGS 393Q. Health-Related Quality of Life.**

Terms, concepts, procedures, methods, problems, and strengths associated with health-related quality of life (HRQOL) research. Three lecture hours a week for one semester. Pharmacy 393Q and Pharmacy Graduate Studies 393Q may not both be counted. Prerequisite: Graduate standing.

### **PGS 393T. Pharmacoeconomics.**

Terms, concepts, procedures, methods, problems, and strengths associated with pharmacoeconomics. Three lecture hours a week for one semester. Only one of the following may be counted: Pharmacy 393T,

394F, Pharmacy Graduate Studies 393T. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

### **PGS 193U, 293U, 393U, 693U, 993U. Pharmacotherapy Master's Mentorship.**

Experience in pharmacy practice, research, and/or administration. For each semester hour of credit earned, three hours of fieldwork a week for one semester. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

### **PGS 195H. Advanced Pharmacotherapy Research Conference.**

One lecture hour a week for one semester. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **PGS 196H. Advanced Medicinal Chemistry Research Conference.**

One lecture hour a week for one semester. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **PGS 396M. Medicinal Chemistry: General Principles, Pharmacological Classification, and Mechanism of Action.**

Introduction to medicinal chemistry, covering drug classes according to their pharmacological classification, structural class, and mechanism of action. Three lecture hours a week for one semester. Pharmacy 396M and Pharmacy Graduate Studies 396M may not both be counted. Prerequisite: Graduate standing; and undergraduate coursework in organic chemistry and biochemistry, or consent of instructor.

### **PGS 196S. Seminar in Pharmacy.**

One lecture hour a week for one semester. Pharmacy 196S and Pharmacy Graduate Studies 196S may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in pharmacy.

### **PGS 196T. Seminar in Toxicology.**

Presentations and discussion of current research topics in toxicology. One lecture hour a week for one semester. Pharmacy 196T and Pharmacy Graduate Studies 196T may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, and admission to the Toxicology Training Program or consent of instructor.

### **PGS 197H. Advanced Pharmacology Research Conference.**

One lecture hour a week for one semester. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **PGS 397M. Drug Design and Synthetic Strategy.**

A multiperspective approach to modern concepts and drug design and synthetic strategy. Three lecture hours a week for one semester. Pharmacy 397M and Pharmacy Graduate Studies 397M may not both be counted. Prerequisite: Graduate standing; and undergraduate courses in organic chemistry and biochemistry, or consent of instructor.

### **PGS 197S. Seminar in Pharmacotherapy: Advanced Topics.**

One lecture hour a week for one semester. Pharmacy 197S and Pharmacy Graduate Studies 197S may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **PGS 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Pharmacy 698A and Pharmacy Graduate Studies 698A may not both be counted. Pharmacy 698B and Pharmacy Graduate Studies 698B may not both be counted. Offered on the credit/no credit basis only. Prerequisite:

For 698A, graduate standing in pharmacy and consent of the graduate adviser; for 698B, Pharmacy Graduate Studies 698A (or Pharmacy 698A).

### **PGS 398T. College Teaching Methodology.**

Interdisciplinary course intended to provide a foundation of theoretical and practical knowledge about teaching at the post-secondary level. Instructional methods; instructional design; practice teaching; teaching philosophy; instructional technology; assessment of learning; class discussions; individual consultations. Three lecture hours a week for one semester. Only one of the following may be counted: Pharmacy 368T, 398T, Pharmacy Graduate Studies 398T. Offered on the letter-grade basis only. Prerequisite: Graduate standing or consent of instructor.

### **PGS 399R, 699R, 799R, 899R, 999R. Dissertation.**

Pharmacy 399R, 699R, 799R, 899R, 999R and Pharmacy Graduate Studies 399R, 699R, 799R, 899R, 999R may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **PGS 399W, 699W, 799W, 899W, 999W. Dissertation.**

Pharmacy 399W, 699W, 799W, 899W, 999W and Pharmacy Graduate Studies 399W, 699W, 799W, 899W, 999W may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Pharmacy Graduate Studies 399R, 699R, 799R, 899R, or 999R (or Pharmacy 399R, 699R, 799R, 899R, or 999R).

## **Translational Science**

*Doctor of Philosophy*

Translational science is an interdisciplinary joint doctoral program offered by the University of Texas Health Science Center at San Antonio, the University of Texas at San Antonio, and the University of Texas at Austin College of Pharmacy, in collaboration with the University of Texas School of Public Health, San Antonio Regional Campus.

## **For More Information**

**Campus address:** Pharmacy Building (PHR) 4.220A, phone (512) 471-6590, fax (512) 471-4066; campus mail code: A1900

**Mailing address:** The University of Texas at Austin, Graduate Program, College of Pharmacy, 2409 University Avenue Stop A1900, Austin TX 78712

**E-mail:** [swcrouch@austin.utexas.edu](mailto:swcrouch@austin.utexas.edu)

**URL:** <http://www.utexas.edu/pharmacy/edutrain/graduate.html>

## **Facilities for Graduate Work**

State-of-the-art research facilities are available for graduate education. Laboratories are equipped with the latest instrumentation and specialized support units for research in all of the areas of study mentioned below. Research space on the Austin campus is located in two pharmacy buildings, the Biomedical Engineering Building, the Dell Pediatric Research Institute, and the Animal Resources Center. In San Antonio, basic laboratory and clinical research space is available in the McDermott Building on the campus of the University of Texas Health Science Center, and at affiliated institutions. Laboratories and offices on both campuses are outfitted with wired and wireless connections for Internet and library access. Students in both Austin and San Antonio have access to extensive electronic journal holdings through the University Libraries Web site (<http://www.lib.utexas.edu>). In addition to these facilities, students will have access to facilities at the partner institutions.

The University of Texas Health Science Center at San Antonio, one of the components in the University of Texas System, consists of five schools: the School of Medicine, the School of Dentistry, School of Nursing, School of Health Professions, and Graduate School of Biomedical Sciences. The UT Health Science Center has become the primary training site for health professionals serving the south Texas region.

The University of Texas at San Antonio is the second largest university in the UT System and one of the state's fastest growing public universities. It is designated by the United States Department of Education as a Hispanic-serving institution.

The University of Texas Health Science Center at Houston is comprised of six schools, including the School of Public Health. The School of Public Health in Houston coordinates programs at regional campuses in Dallas, San Antonio, El Paso, Austin, and Brownsville. This statewide presence makes the School of Public Health a pivotal public health resource for Texas.

## Areas of Study

The College of Pharmacy offers graduate study leading to the Doctor of Philosophy degree with a major in translational science. Students will select a TS1 or TS2 track based on research experience and interest, and in consultation with the graduate adviser from the student's primary institution and/or the student's supervising professor. An individualized educational plan will be developed for each student. More information is available from the graduate adviser.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Jamie C Barner	Kenneth A Lawson
Andrew Ellington	Karen L Rascati
Carlton K Erickson	Kelly Renee Reveles
Christopher R Frei	Nathan P Wiederhold
R A Harris	Robert O Williams III
Jim M Koeller	James P Wilson
Yui-Wing F Lam	

## Admission Requirements

Prospective students applying to the translational science PhD program must have a master's or professional degree (MD, DDS, or PharmD) prior to enrollment in the program. Students are admitted to the program upon recommendation of the translational science admission committee, comprised of representatives from each partner institution's Graduate Studies Committee.

## Degree Requirements

Students must complete at least seventy-two semester hours of graduate coursework. An overall grade point average of 3.00 must be maintained for program continuation and completion. Students are required to take a minimum of twenty-four semester hours of core curriculum; twelve semester hours of prescribed track electives selected from the list of elective courses for this program; six semester hours of free electives selected from any course offered at participating graduate programs; and thirty semester hours of research and dissertation work.

While there is no prescribed sequence of courses for the program, students and their graduate advisers must develop an individualized education plan that accounts for the varied semester course offerings and prerequisites and that can be completed in three years. Upon completion of the qualifying examinations, the student meets with the appropriate

committee and graduate adviser, who then recommend to the graduate dean whether the student should be admitted to doctoral candidacy. After admission to candidacy, the student must enroll in the dissertation course each fall and spring semester.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Pharmacy Graduate Studies: PGS

#### PGS 380F. Biomedical Pharmacology I.

Basic neurotransmission and pharmacological principles. Physiological effects of drugs used in disease states including neurological, cardiovascular, psychiatric disorders, and pain relief. Three lecture hours a week for one semester. Only one of the following may be counted: Neuroscience 380F, Pharmacy 380F, 480F, Pharmacy Graduate Studies 380F. Offered on the letter-grade basis only. Prerequisite: Graduate standing and experience or prior coursework in physiology, biochemistry, or organic chemistry.

#### PGS 380G. Biomedical Pharmacology II.

Fundamental concepts of pharmacology, including molecular mechanisms of drug action, absorption, distribution and elimination, tolerance, dependence, mutagenesis, teratogenesis, and carcinogenesis. Three lecture hours a week for one semester. Pharmacy 380N, 480N, and Pharmacy Graduate Studies 380G may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing; and Pharmacy 480F (or 380F), Pharmacy Graduate Studies 380F, or consent of instructor.

#### PGS 180J, 280J, 380J. Advanced Pharmaceutics: Laboratory Research.

Three, six, or nine laboratory hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

#### PGS 180M, 280M, 380M. Advanced Pharmaceutics.

For each semester hour of credit earned, one lecture hour a week for one semester. Pharmacy 180M, 280M, 380M and Pharmacy Graduate Studies 180M, 280M, 380M may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

#### PGS 380S. Basic Principles in Experimental Design and Statistics.

Basic principles in experimental design and statistics with a focus on real world situations that may be encountered while performing scientific research. Overview of the effective presentation of statistical results, displaying professionalism, and communication skills. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

#### PGS 380T. Texas Venture Labs Startup Practicum.

Places students in teams and connects them with Austin-area startup companies. The teams then execute business consulting projects for the startup companies. Explores how these projects help companies better understand their market, competition, business model, etc, in order to accelerate their path to market and funding decisions. Three lecture

hours a week for one semester Only one of the following may be counted: Aerospace Engineering 396 (Topic: Texas Venture Labs Practicum), Electrical Engineering 390V (Topic: Texas Venture Labs Practicum), Engineering Mechanics 397 (Topic: Texas Venture Labs Practicum), Management 385 (Topic: Texas Venture Labs Practicum), Mechanical Engineering 397 (Topic: Texas Venture Labs Practicum), Pharmacy Graduate Studies 380M (Topic: Texas Venture Labs Startup Practicum). Prerequisite: Graduate standing.

#### **PGS 381F. Product Development.**

Application of physical-chemical principles to the formulation and development of stable and bioavailable drug delivery systems. Three lecture hours a week for one semester. Pharmacy 381D and Pharmacy Graduate Studies 381F may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing in the College of Pharmacy, or consent of instructor.

#### **PGS 381G. Advanced Manufacturing Pharmacy.**

Physical-mechanical properties of compacts, drugs, and polymers. Properties of biodegradable and nonbiodegradable polymers in pharmaceutical formulations. Process validation and pilot plant scale-up. Three lecture hours a week for one semester. Pharmacy 381G and Pharmacy Graduate Studies 381G may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing in the College of Pharmacy, or consent of instructor.

#### **PGS 381H. Advanced Pharmaceutical Processing.**

Didactic and laboratory exposure to pharmaceutical processes used in the design, development, and optimization of drug delivery systems. Emphasis on equipment and machinery used in pharmaceutical manufacturing of these dosage forms, with discussion of other issues, such as technology transfer and scale-up. Three lecture hours a week for one semester. Pharmacy 380Q and Pharmacy Graduate Studies 381H may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing in the College of Pharmacy, or consent of instructor.

#### **PGS 181J, 281J, 381J. Advanced Pharmacy Administration: Laboratory Research.**

Three, six, or nine laboratory hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

#### **PGS 181M, 281M, 381M. Advanced Pharmacy Administration.**

For each semester hour of credit earned, one lecture hour a week for one semester. Pharmacy 181M, 281M, 381M and Pharmacy Graduate Studies 181M, 281M, 381M may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

#### **PGS 381N. Health Care Systems.**

Overview of the health care system in the United States and examination of the classic and contemporary literature on managed health care systems, with emphasis on pharmacy-related issues. Studies the advantages, disadvantages, and effects of these systems on patients, providers, and payers. Three lecture hours a week for one semester. Pharmacy 381N and Pharmacy Graduate Studies 381N may not both be counted. Prerequisite: Graduate standing.

#### **PGS 381V. Communication Skills for Translational Scientists.**

Explores oral and written communication skills for scientists conducting translational research at the interface of basic and clinical science. Introduction to the skills necessary to successfully convey medication and healthcare-related data in a professional manner. Involves discussions addressing subjects such as medical writing, grant writing, abstract

development, and poster design. Three lecture hours a week for one semester Pharmacy 381V and Pharmacy Graduate Studies 381V may not both be counted. Prerequisite: Graduate standing and consent of instructor.

#### **PGS 381W. Molecular and Pharmacological Basis of Therapeutics.**

Broad issues of molecular pharmacotherapeutics, including potential and challenge for optimization of drug therapy, implications for drug development and regulation, ethical and social aspects of pharmacogenomics, signal transduction, use of knock-out mice, and informed consent process in pharmacogenomic research. Three lecture hours a week for one semester. Pharmacy 381W and Pharmacy Graduate Studies 381W may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

#### **PGS 282J. Advanced Pharmacotherapy Seminar I.**

Discussion of advanced pharmacotherapeutics topics, case presentations, and journal clubs at the advanced practitioner level. Two lecture hours a week for one semester. Pharmacy 282JA and Pharmacy Graduate Studies 282J may not both be counted. Prerequisite: Graduate standing and consent of instructor.

#### **PGS 282K. Advanced Pharmacotherapy Seminar II.**

Discussion of advanced pharmacotherapeutics topics, case presentations, and journal clubs at the advanced practitioner level. Two lecture hours a week for one semester. Pharmacy 282JB and Pharmacy Graduate Studies 282K may not both be counted. Prerequisite: Graduate standing and consent of instructor.

#### **PGS 382R. Recent Advanced in Pharmaceutics.**

Presentation of topics of current research interest in physical pharmacy, biopharmaceutics, and pharmacokinetics. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### **PGS 282S, 382S. Advanced Biopharmaceutics.**

Provides students with a more comprehensive background in biopharmaceutics and the drug approval process. For each semester hour of credit earned, one lecture hour a week for one semester. Only one of the following may be counted: Pharmacy 382S, Pharmacy Graduate Studies 280M (Topic: Advanced Biopharmaceutics), 282S, 382S. Prerequisite: Graduate standing or consent of instructor.

#### **PGS 382T. Basic Concepts of Tumor Biology.**

A survey of cancer biology that includes tumor pathology, initiation, progression and metastasis, genetic instability, DNA damage and repair, cell cycle control, oncogenes, tumor suppressor genes, and the immune response. Three lecture hours a week for one semester. Pharmacy 388K (Topic: Basic Concepts of Tumor Biology) and Pharmacy Graduate Studies 382T may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

#### **PGS 382V. Pharmaceutical Biotechnology.**

Application of protein, oligonucleotide, and related molecules as therapeutic agents: stability, formulation, kinetics, dynamics. Three lecture hours a week for one semester. Pharmacy 382V and Pharmacy Graduate Studies 382V may not both be counted. Prerequisite: Graduate standing; and the following coursework: Chemistry 339K, Pharmacy 342C, 142P, 252C, 171P, and 371S, or the equivalent; or consent of instructor.

#### **PGS 182W. Ethics in Science and Clinical Practice.**

Ethical considerations in the conduct of clinical research, including institutional review boards, adherence to protocol, Food and Drug Administration and related site reviews, protection of human subjects

through informed consent and confidentiality, and the use of genetic banks in research. One lecture hour a week for one semester. Pharmacy 182W and Pharmacy Graduate Studies 182W may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **PGS 383D. Neuropharmacology.**

An advanced survey of neurotransmitters and systems in the brain. Covers experimental approaches and pharmacological analysis at behavioral, neurochemical, and neuroanatomical levels to determine mechanisms of actions of drugs that act on the brain. Three lecture hours a week for one semester. Only one of the following may be counted: Neuroscience 383D, Pharmacy 383D, Pharmacy Graduate Studies 383D. Prerequisite: Graduate standing and consent of instructor.

### **PGS 383N. Solution Theory and Disperse Systems.**

The theory and technology of solutions and heterogeneous systems; applications of scientific principles to the design of pharmaceutical products; a study of factors influencing physical chemical characteristics, stability, and biopharmaceutical activity of solutions and coarse dispersions; review of recent literature. Three lecture hours a week for one semester. Pharmacy 383N and Pharmacy Graduate Studies 383N may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **PGS 383P. Advanced Pharmacokinetics.**

Study of the kinetics of absorption, distribution, metabolism, and excretion of drugs in the intact organism. Three lecture hours a week for one semester. Pharmacy 383P and Pharmacy Graduate Studies 383P may not both be counted. Prerequisite: Graduate standing, and Pharmacy 252C or an equivalent pharmacokinetics course.

### **PGS 383Q. Statistics in Translational Science.**

Pharmaceutical statistical analysis with a focus on choosing the appropriate statistical test to address both basic science and clinical research hypotheses. Students use the JMP 7 software package to execute statistical analysis on their own pharmaceutical research projects. Three lecture hours a week for one semester. Pharmacy 383Q and Pharmacy Graduate Studies 383Q may not both be counted. Prerequisite: Graduate standing in the College of Pharmacy, and an introductory statistics course or consent of instructor.

### **PGS 383R. Rate Processes in Pharmaceutical Systems.**

A study of decomposition and stabilization of drug molecules in solutions and in solid dosage forms; principles of kinetics and diffusion as applied to pharmaceutical systems. Three lecture hours a week for one semester. Pharmacy 383R and Pharmacy Graduate Studies 383R may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **PGS 383V. Research Design and Methods.**

A practical approach to classical and experimental design. Hypothesis generation, experimental design that uses translational research methods (such as incorporating basic and clinical science), grantsmanship, and protocol development. Three lecture hours a week for one semester. Pharmacy 383V and Pharmacy Graduate Studies 383V may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **PGS 383W. Biopharmaceutical Analysis.**

Analytical methods for the isolation and identification of drugs and their metabolites, specific genes, and proteins in biological fluids. Three lecture hours a week for one semester. Pharmacy 383W and Pharmacy Graduate Studies 383W may not both be counted. Prerequisite: Graduate standing in pharmacy, completion of a PharmD degree, and concurrent enrollment in Pharmacy Graduate Studies 184U.

### **PGS 384K. Fundamentals of Toxicology.**

An organ system approach to advanced topics in general toxicology. Three lecture hours a week for one semester. Required course for pharmacology and toxicology graduate students specializing in toxicology. Pharmacy 384K and Pharmacy Graduate Studies 384K may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing, and some background in pharmacology or consent of instructor.

### **PGS 384L. Biochemical and Molecular Toxicology.**

Discussion of mechanisms of selected drugs and toxicants. Three lecture hours a week for one semester. Pharmacy 390N and Pharmacy Graduate Studies 384L may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing, and some background in pharmacology or consent of instructor.

### **PGS 384N. Health Behavior Theory and Medication Use Process.**

In-depth analysis of the social and behavioral issues that affect medication use, using the content, theories, and methodologies associated with patient compliance research. Three lecture hours a week for one semester. Pharmacy 384N and Pharmacy Graduate Studies 384N may not both be counted. Prerequisite: Graduate standing.

### **PGS 384S. Introduction to Epidemiology.**

Principles of epidemiology; descriptive analytic, and clinical epidemiology; epidemiologic perspective for health care management; epidemiology and the public policy process; pharmacoepidemiology. Three lecture hours a week for one semester. Pharmacy 384S and Pharmacy Graduate Studies 384S may not both be counted. Prerequisite: Graduate standing; with consent of instructor, may be taken by students in the professional pharmacy curriculum.

### **PGS 384T. Advanced Epidemiology.**

Review of major research methods and current issues within drug epidemiology. Emphasis on application of methods by reviewing historical and contemporary literature/examples. Areas presented include: how to read, interpret, design, conduct, review, critique and evaluate pharmacoepidemiology studies. Three lecture hours a week for one semester. Pharmacy 381M (Topic: Advanced Epidemiology) and Pharmacy Graduate Studies 384T may not both be counted. Prerequisite: Graduate standing, and Pharmacy Graduate Studies 384S (or Pharmacy 384S) or consent of instructor.

### **PGS 184U. Biopharmaceutical Analysis Laboratory.**

Analytical methods for the isolation and identification of drugs and their metabolites, specific genes, and proteins in biological fluids. One lecture hour and three laboratory hours a week for one semester. Pharmacy 184U and Pharmacy Graduate Studies 184U may not both be counted. Prerequisite: Graduate standing in pharmacy, registration for Pharmacy Graduate Studies 383W, and completion of a PharmD degree.

### **PGS 185D. Responsible Conduct of Science.**

Ethical considerations in the conduct of science, including issues of animal welfare and/or human subjects research, data analysis, fraud, publications, misconduct, intellectual property, grants, peer review, and mentor responsibility. One lecture hour a week for one semester. Only one of the following may be counted: Neuroscience 185D, Pharmacy 185D, Pharmacy Graduate Studies 185D. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and admission to the doctoral program in pharmacy, or consent of instructor.

### **PGS 185G. Grant Writing for Pharmacology and Toxicology.**

Subjects include federal and nonfederal grants, specific aims, preliminary data, hypothesis testing, experimental design, peer review, responding to critiques, biosketch, and budgeting. One lecture hour a week for

one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in the pharmacology and toxicology program or consent of instructor.

### **PGS 185J, 285J, 385J. Advanced Pharmacotherapy Laboratory Research.**

Three, six, or nine laboratory hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **PGS 385L. Clinical Pharmacokinetics.**

In-depth analysis of pharmacotherapeutic regimens, using complex mathematical models. Three lecture hours a week for one semester. Pharmacy 385L and Pharmacy Graduate Studies 385L may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

### **PGS 385M. Advanced Pharmacokinetics and Pharmacodynamics.**

Continuation of Pharmacy Graduate Studies 385L. Advanced pharmacokinetic and pharmacodynamic concepts and their application. Three lecture hours a week for one semester. Pharmacy 385M and Pharmacy Graduate Studies 385M may not both be counted. Prerequisite: Graduate standing, Pharmacy Graduate Studies 385L (or Pharmacy 385L), and consent of instructor.

### **PGS 185W, 285W, 385W. Advanced Topics in Pharmacotherapy.**

One, two, or three lecture hours a week for one semester. Pharmacy 185W and Pharmacy Graduate Studies 185W, 285W, 385W may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor; additional prerequisites vary with the topic.

### **PGS 386C. Cellular and Systems Physiology I.**

Basic principles of human physiology and anatomy in relation to drug action. Includes cellular and subcellular physiology, membrane transport, electrophysiology, synaptic transmission, and autonomic, neurological, and cardiovascular physiology and anatomy. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing in the Institute for Cellular and Molecular Biology, the Institute for Neuroscience, pharmacy, or psychology; and a year of undergraduate coursework in both general biology and chemistry.

### **PGS 386D. Cellular and Systems Physiology II.**

Principles of cellular and systems physiology. Subjects include immunology, kidney function, respiration, acid-base balance, blood and hematopoiesis, general endocrinology, neuroendocrinology, and reproduction. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing, and Pharmacy Graduate Studies 386C or consent of instructor.

### **PGS 186J, 286J, 386J. Advanced Medicinal Chemistry: Laboratory Research.**

Modern laboratory techniques used in medicinal and natural products chemistry. Three, six, or nine laboratory hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **PGS 186K, 286K, 386K. Advanced Medicinal Chemistry.**

For each semester hour of credit earned, one lecture hour a week for one semester. Pharmacy 186K, 286K, 386K and Pharmacy Graduate Studies 186K, 286K, 386K may not both be counted unless the topics vary.

May be repeated for credit when the topics vary. Prerequisite: Graduate standing; additional prerequisites vary with the topic.

### **PGS 386M. Pharmaceutical Industry and Marketing.**

Subjects include the structure, size, and regulation of the pharmaceutical industry, including good manufacturing practices; drug development, pricing, marketing, and channels of distribution; and issues that impact the drug development industry, including generic drug competition, patent life, active ingredient importation and finished drug product importation, drug counterfeiting and safety concerns, direct-to-consumer advertising, and the drug approval process. Three lecture hours a week for one semester. Pharmacy 386M and Pharmacy Graduate Studies 386M may not both be counted. Prerequisite: Graduate standing and consent of instructor.

### **PGS 186N, 286N, 386N, 486N. Topics in Pharmacy.**

Current issues in translational science. For each semester hour of credit earned, one lecture hour a week for one semester. Pharmacy 186N, 286N, 386N, 486N and Pharmacy Graduate Studies 186N, 286N, 386N, 486N may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and admission to the Doctor of Philosophy in Translational Science degree program; additional prerequisites vary with the topic.

### **PGS 487Q. Communication Skills for Scientists.**

Designed to enhance written and oral communication skills through lectures and practice. Covers grant writing, journal paper writing, poster presentation writing, and delivery. Four lecture hours a week for one semester. Pharmacy 487Q and Pharmacy Graduate Studies 487Q may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing in pharmacy, neuroscience, or a biological science; additional prerequisite for international students: completion of the University's English Certification Program or consent of instructor.

### **PGS 388C. Introductory Bioorganic Chemistry.**

Survey of enzyme-catalyzed reactions, with emphasis on mechanism, experimental design, and applications in natural products biosynthesis. Three lecture hours a week for one semester. Pharmacy 388C and Pharmacy Graduate Studies 388C may not both be counted. Prerequisite: Graduate standing, and undergraduate courses in organic chemistry and biochemistry or consent of instructor.

### **PGS 188J, 288J, 388J. Advanced Pharmacology: Laboratory Research.**

Three, six, or nine laboratory hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor.

### **PGS 188K, 288K, 388K. Advanced Pharmacology.**

For each semester hour of credit earned, one lecture hour a week for one semester. Pharmacy 188K, 288K, 388K and Pharmacy Graduate Studies 188K, 288K, 388K may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor; additional prerequisites vary with the topic.

### **PGS 389C. Pharmacy Association Management.**

An introduction to the principles involved in managing pharmacy associations. Nine hours of fieldwork a week for one semester. Only one of the following may be counted: Pharmacy 329C, 389C, Pharmacy Graduate Studies 389C. Prerequisite: Graduate standing and consent of instructor.

### **PGS 389J. Advanced Pharmacotherapeutics of Cardiovascular Disorders.**

Designed to provide the student with a sound knowledge and comprehension of contemporary pharmacotherapeutic regimens used in treating cardiovascular diseases. Three lecture hours a week for one semester. Pharmacy 389J and Pharmacy Graduate Studies 389J may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

### **PGS 389P. Advanced Pharmacotherapeutics of Infectious Diseases.**

Designed to provide the student with a sound knowledge and comprehension of contemporary therapeutic principles used in treating infectious diseases. Three lecture hours a week for one semester. Pharmacy 389P and Pharmacy Graduate Studies 389P may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

### **PGS 189Q. Seminar in Alcohol Studies.**

Presentations and discussion of current research topics in alcohol studies. One lecture hour a week for one semester. Pharmacy 189Q and Pharmacy Graduate Studies 189Q may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **PGS 190G, 290G, 390G. Advanced Pharmacotherapeutics of Human Diseases and Illnesses.**

A comprehensive analysis of disease processes and a determination of appropriate therapeutic interventions for the treatment of those diseases. For each semester hour of credit earned, one lecture hour a week for one semester. Pharmacy 190G, 290G, 390G, 490G and Pharmacy Graduate Studies 190G, 290G, 390G, 490G may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor; additional prerequisites vary with the topic.

### **PGS 190H. Advanced Pharmaceutics Research Conference.**

One lecture hour a week for one semester. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **PGS 390J. Data Analysis in Health Care.**

Statistical analysis of research data using the computer and various statistical software programs. Three lecture hours a week for one semester. Pharmacy 390J and Pharmacy Graduate Studies 390J may not both be counted. Prerequisite: Graduate standing, and an introductory course in statistics or consent of instructor.

### **PGS 390K. Experimental Design and Research Methodology in Health Care.**

Principles and procedures of experimental, quasi-experimental, and non-experimental research designs; includes reliability, validity, data collection methods, qualitative study designs, and survey methodologies. Three lecture hours a week for one semester. Pharmacy 390K and Pharmacy Graduate Studies 390K may not both be counted. Prerequisite: Graduate standing.

### **PGS 190R, 290R, 390R. Special Problems in Pharmacotherapy.**

Individual supervision of research problems in the clinical pharmacy sciences, including pharmacokinetics, pharmacodynamics, efficacy, safety, and pharmaceutical care. Three, six, or nine laboratory hours a week for one semester. Pharmacy 190R, 290R, 390R and Pharmacy Graduate Studies 190R, 290R, 390R may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite:

Graduate standing and consent of instructor; additional prerequisites vary with the topic.

### **PGS 390U. Advanced Research Methods in Health Care.**

Advanced methodologies used in pharmacy administration research; designed to build upon the skills covered in Pharmacy 390K. Explores data management issues and statistical procedures, with emphasis on the application of research methodology concepts and principles. Three lecture hours a week for one semester. Pharmacy 390U and Pharmacy Graduate Studies 390U may not both be counted. Prerequisite: Graduate standing and Pharmacy Graduate Studies 390K (or Pharmacy 390K).

### **PGS 291E. Advanced Hematology and Oncology Seminar I.**

In-depth discussion of the contemporary pharmacotherapy and patient care relating to hematology, oncology, and bone marrow transplantation. Two lecture hours a week for one semester. Pharmacy 491GA and Pharmacy Graduate Studies 291E may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **PGS 291F. Advanced Hematology and Oncology Seminar II.**

In-depth discussion of the contemporary pharmacotherapy and patient care relating to hematology, oncology, and bone marrow transplantation. Two lecture hours a week for one semester. Pharmacy 491GB and Pharmacy Graduate Studies 291F may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **PGS 191H. Advanced Health Outcomes and Pharmacy Practice Research Conference.**

One lecture hour a week for one semester. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **PGS 191Q. Pharmacy and Its Disciplines.**

An overview of pharmacy and its primary disciplines of pharmaceutics, medicinal chemistry, pharmacy administration and practice, pharmacotherapy, and pharmacology/toxicology. One lecture hour a week for one semester. Pharmacy 191Q and Pharmacy Graduate Studies 191Q may not both be counted. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

### **PGS 292E. Clinical Research Methods I.**

Defining a research question, general study design issues, cross-sectional and case-control studies, and diagnostic test evaluation. Two lecture hours a week for one semester. Pharmacy 292E and Pharmacy Graduate Studies 292E may not both be counted. Prerequisite: Graduate standing.

### **PGS 292F. Clinical Research Methods II.**

Prospective observational studies; randomized controlled trials, nonrandomized intervention studies; meta-analysis; and data synthesis, evaluation, and application. Two lecture hours a week for one semester. Pharmacy 292F and Pharmacy Graduate Studies 292F may not both be counted. Prerequisite: Graduate standing; and Pharmacy Graduate Studies 292E (or Pharmacy 292E) or consent of instructor.

### **PGS 092T. Joint PhD Program with Partner Institutions.**

Translational science study at partner institutions. May not be taken concurrently with another course at the University of Texas at Austin. May be repeated for credit. Prerequisite: Graduate standing and admission to the Doctor of Philosophy in Translational Science degree program.

### **PGS 393Q. Health-Related Quality of Life.**

Terms, concepts, procedures, methods, problems, and strengths associated with health-related quality of life (HRQOL) research. Three lecture hours a week for one semester. Pharmacy 393Q and Pharmacy

Graduate Studies 393Q may not both be counted. Prerequisite: Graduate standing.

#### **PGS 393T. Pharmacoeconomics.**

Terms, concepts, procedures, methods, problems, and strengths associated with pharmacoeconomics. Three lecture hours a week for one semester. Only one of the following may be counted: Pharmacy 393T, 394F, Pharmacy Graduate Studies 393T. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

#### **PGS 193U, 293U, 393U, 693U, 993U. Pharmacotherapy Master's Mentorship.**

Experience in pharmacy practice, research, and/or administration. For each semester hour of credit earned, three hours of fieldwork a week for one semester. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

#### **PGS 195H. Advanced Pharmacotherapy Research Conference.**

One lecture hour a week for one semester. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

#### **PGS 196H. Advanced Medicinal Chemistry Research Conference.**

One lecture hour a week for one semester. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

#### **PGS 396M. Medicinal Chemistry: General Principles, Pharmacological Classification, and Mechanism of Action.**

Introduction to medicinal chemistry, covering drug classes according to their pharmacological classification, structural class, and mechanism of action. Three lecture hours a week for one semester. Pharmacy 396M and Pharmacy Graduate Studies 396M may not both be counted. Prerequisite: Graduate standing; and undergraduate coursework in organic chemistry and biochemistry, or consent of instructor.

#### **PGS 196S. Seminar in Pharmacy.**

One lecture hour a week for one semester. Pharmacy 196S and Pharmacy Graduate Studies 196S may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in pharmacy.

#### **PGS 196T. Seminar in Toxicology.**

Presentations and discussion of current research topics in toxicology. One lecture hour a week for one semester. Pharmacy 196T and Pharmacy Graduate Studies 196T may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, and admission to the Toxicology Training Program or consent of instructor.

#### **PGS 197H. Advanced Pharmacology Research Conference.**

One lecture hour a week for one semester. May be repeated for credit. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

#### **PGS 397M. Drug Design and Synthetic Strategy.**

A multiperspective approach to modern concepts and drug design and synthetic strategy. Three lecture hours a week for one semester. Pharmacy 397M and Pharmacy Graduate Studies 397M may not both be counted. Prerequisite: Graduate standing; and undergraduate courses in organic chemistry and biochemistry, or consent of instructor.

#### **PGS 197S. Seminar in Pharmacotherapy: Advanced Topics.**

One lecture hour a week for one semester. Pharmacy 197S and Pharmacy Graduate Studies 197S may not both be counted. Offered

on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

#### **PGS 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Pharmacy 698A and Pharmacy Graduate Studies 698A may not both be counted. Pharmacy 698B and Pharmacy Graduate Studies 698B may not both be counted. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in pharmacy and consent of the graduate adviser; for 698B, Pharmacy Graduate Studies 698A (or Pharmacy 698A).

#### **PGS 398T. College Teaching Methodology.**

Interdisciplinary course intended to provide a foundation of theoretical and practical knowledge about teaching at the post-secondary level. Instructional methods; instructional design; practice teaching; teaching philosophy; instructional technology; assessment of learning; class discussions; individual consultations. Three lecture hours a week for one semester. Only one of the following may be counted: Pharmacy 368T, 398T, Pharmacy Graduate Studies 398T. Offered on the letter-grade basis only. Prerequisite: Graduate standing or consent of instructor.

#### **PGS 399R, 699R, 799R, 899R, 999R. Dissertation.**

Pharmacy 399R, 699R, 799R, 899R, 999R and Pharmacy Graduate Studies 399R, 699R, 799R, 899R, 999R may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

#### **PGS 399W, 699W, 799W, 899W, 999W. Dissertation.**

Pharmacy 399W, 699W, 799W, 899W, 999W and Pharmacy Graduate Studies 399W, 699W, 799W, 899W, 999W may not both be counted. Offered on the credit/no credit basis only. Prerequisite: Pharmacy Graduate Studies 399R, 699R, 799R, 899R, or 999R (or Pharmacy 399R, 699R, 799R, 899R, or 999R).

## **Lyndon B. Johnson School of Public Affairs**

*Master of Global Policy Studies  
Master of Public Affairs  
Doctor of Philosophy (in Public Policy)*

### **For More Information**

**Campus address:** Sid Richardson Hall (SRH) 3.107, phone (512) 471-4292, fax (512) 471-8455; campus mail code: E2700

**Mailing address:** The University of Texas at Austin, Lyndon B. Johnson School of Public Affairs, P O Box Y, Austin TX 78713

**E-mail:** lbj admit@uts.cc.utexas.edu

**URL:** <http://www.utexas.edu/lbj/>

### **Facilities for Graduate Work**

The Lyndon B. Johnson School of Public Affairs is housed in Sid Richardson Hall, adjacent to the Lyndon Baines Johnson Library and Museum.

The school's computation center maintains a computer laboratory and provides access to the Internet and to the University's computer infrastructure. The laboratory is reserved for public affairs students and is available twenty-four hours a day.



## Areas of Study

Graduate study in public affairs is interdisciplinary, research oriented, and built around public policy problems.

### Master of Global Policy Studies

This degree program is designed to provide students with the tools and knowledge necessary to be leaders in an increasingly interdependent world. The program offers a multidisciplinary approach to studying the complex economic, political, technological, and social issues of the twenty-first century. Students pursuing the Master of Global Policy Studies select a specialization in security, law, and diplomacy; international trade and finance; development; global governance and international law; international energy, environment, and technology; or regional international policy. Students may also propose their own specialization, which is subject to approval.

### Master of Public Affairs

This degree program aims to provide students with the skills and understanding required for effective professional leadership in developing and implementing public policies. While there is no specific requirement to do so, Master of Public Affairs students may elect to organize their studies around certain areas of specialization. Depending on his or her qualifications, a student can pursue the Master of Public Affairs degree through the regular program, a dual degree program, the midcareer option, or the executive program in public leadership.

### Doctor of Philosophy

The doctoral degree program in public policy is a research-oriented program designed to give the student substantial knowledge of one or more disciplines, an understanding of the policy process, and technical mastery of advanced research skills. It is intended to develop research scholars and university teachers who can make substantive contributions to our understanding of complex public policy problems and who can conduct research in multidisciplinary settings.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Jacqueline L Angel	Sheila Marie Olmstead
Robert D Auerbach	Todd A Olmstead
Leigh B Boske	Cynthia Osborne
Joshua W Busby	Francie Ostrower
Robert M Chesney	Varun Rai
Edwin Dorn	Samuel Starr Richardson
David J Eaton	Victoria E Rodriguez
Joshua David Eisenman	William G Spelman
Kenneth Flamm	David W Springer
James K Galbraith	Paul J Stekler
Charles E Gholz	Chandler W Stolp
Michael H Granof	Jeremi Suri
Carolyn Heinrich	Philip U Treisman
Robert L Hutchings	Paul Von Hippel
William Inboden	Peter Ward
Bobby R Inman	David C Warner
Christopher T King	Catherine Elizabeth Weaver
Alan J Kuperman	Robert H Wilson
Erin Lentz	Patrick P Wong
Jane Lincove	

## Admission Requirements

Admission decisions are made by the Admissions Committee. The committee considers an applicant's academic and employment records, his or her scores on the Graduate Record Examinations General Test, three letters of recommendation from professors or employers, and three essay questions addressing the applicant's background and interest in public policy. A résumé and transcripts for all college coursework are also required.

While there are no prescribed course prerequisites, students entering the Master of Public Affairs program are expected to have completed coursework in three areas: mathematics and statistics, economics, and American government. Many students find it useful to take a review course in college algebra, calculus, and statistics the summer before entering the program. Students entering the Master of Global Policy Studies program are also expected to have completed undergraduate coursework in statistics. In addition, many students find the following courses to be useful: two semesters of principles of economics, at least one semester of undergraduate international relations or world history, and one semester of calculus. Applicants to the doctoral degree program are expected to have a graduate degree from a policy-related academic or professional program.

Additional information on degree requirements (<http://www.utexas.edu/lbj/academics>) and the application process (<http://www.utexas.edu/lbj/prospective>) is available from the Lyndon B. Johnson School of Public Affairs Web site.

## Degree Requirements

### Master of Global Policy Studies

The curriculum for the Master of Global Policy Studies consists of forty-nine hours of coursework. In addition to required coursework in the student's specialization, the curriculum combines courses in the development of global policy and principles of international relations, microeconomics, analytical methods, international economics, and a crisis management seminar with a practical applications sequence that includes a client-oriented policy research project and a sequence of professional writing courses. A field experience is appropriate in most specializations, and may be satisfied with a formal internship course, a noncredit internship experience, or other international field study. A typical forty-nine-semester-hour program of study includes seven one-semester, three-hour core courses; a one-hour core course; at least one two-semester policy research project; electives; and an individual writing requirement.

The student must fulfill all academic requirements within six years of his or her entrance into the program. Most students are expected to complete the program in two years of full-time study.

**DC program.** The DC program option offers a master's student a unique two-semester curriculum in federal policy making relating to international affairs thereby facilitating entry into federal careers. The track requires completion of forty-five semester hours of coursework. Students attend UT Austin their first two semesters taking twenty-four semester credit hours. After the first year, students will spend the summer and fall in Washington, DC. Coursework will include a unique apprenticeship opportunity in a public or non-profit agency based on the student's area of policy. The first cohort is expected to matriculate in the fall of 2015 and graduate with a Master of Global Policy Studies degree in December of 2016.

## Master of Public Affairs

The curriculum for the Master of Public Affairs normally consists of forty-eight semester hours of coursework. Up to nine hours in core courses may be waived and substituted with approved electives if a student demonstrates prior training and proficiency substantially equivalent to core courses in introductory quantitative methods, microeconomics, and public financial management. The curriculum combines courses in politics and the policy process, economic analysis, empirical methods, and management with a practical applications sequence that includes client-oriented policy research projects; it also allows the student to develop an area of specialization. A public service internship is required in the absence of relevant prior public service experience. A typical forty-eight-semester-hour program of study includes seven one-semester core courses, at least one two-semester policy research project, a ten- to twelve-week internship generally completed between the first and second years, six or seven electives, and an optional professional report.

The student must fulfill all academic requirements within six years of his or her entrance into the program. Dual degree programs require additional coursework.

**Regular program.** Most students are admitted to the regular program, which they are generally expected to complete in two years of full-time study. A student who cannot attend full time may choose to complete the regular program on a part-time basis; the applicant must submit a written request for admission on a part-time basis when he or she applies for admission to the regular program. A student enrolled in the regular program full time may be allowed, for good reason, to change to part-time status.

**DC program.** The DC program option offers a student enrolled in the master's program a unique two-semester curriculum in federal policy which facilitates entry into federal careers. The track requires completion of forty-five semester hours of coursework. Students attend UT Austin their first two semesters taking twenty-four semester credit hours. After the first year, students will spend the summer and fall in Washington, DC. Coursework will include a unique apprenticeship opportunity in a public or non-profit agency based on the student's area of policy.

**Executive program.** The executive program is designed for public service professionals who wish to gain the knowledge and skills necessary for public leadership. The program requires completion of thirty-two semester hours of coursework over four semesters. The curriculum consists of an intensive gateway course, followed by courses in strategic communications, executive analytics, executive management, and a final research capstone course.

**Midcareer program.** Each year a small number of applicants with substantial work experience are admitted to the midcareer program. In general, an applicant should have at least five years of experience in substantive policy-level or administrative positions related to the public sector. The applicant must submit a written request for admission to the midcareer program when he or she applies for admission to the school; the request must be accompanied by supporting material detailing the applicant's public service and policy-level work experience. The midcareer student must complete twenty-seven hours of core courses, and at least nine hours of relevant electives.

## Dual Degree Programs

The Lyndon B. Johnson School of Public Affairs offers the following dual degree programs in cooperation with other divisions of the University. More information is available from the graduate adviser in each program.

## Master of Global Policy Studies

Field(s) of Study	Degree(s)
Asian studies	Master of Arts
Business administration	Master of Business Administration
Energy and earth resources	Master of Arts
Information studies	Master of Science in Information Studies
Journalism	Master of Arts
Latin American studies	Master of Arts
Law	Doctor of Jurisprudence
Middle Eastern studies	Master of Arts
Public health	Master of Public Health
Russian, East European, and Eurasian studies	Master of Arts

## Master of Public Affairs

Field(s) of Study	Degree(s)
Advertising	Master of Arts
Asian studies	Master of Arts
Business administration	Master of Business Administration
Communication studies	Master of Arts
Community and regional planning	Master of Science in Community and Regional Planning
Energy and earth resources	Master of Arts
Engineering	Master of Science in Engineering
Information studies	Master of Science in Information Studies
Journalism	Master of Arts
Latin American studies	Master of Arts
Law	Doctor of Jurisprudence
Middle Eastern studies	Master of Arts
Public health	Master of Public Health
Radio-television-film	Master of Arts
Russian, East European, and Eurasian studies	Master of Arts
Social work	Master of Science in Social Work
Women's and gender studies	Master of Arts

## Doctor of Philosophy

The doctoral program in public policy requires at least thirty-six hours of coursework beyond the master's degree (in addition to the dissertation reading and writing courses) and includes supporting work in courses outside public affairs. The supporting work is intended to deepen the student's understanding of an organized discipline and its application to public policy. A doctoral degree candidate must fulfill the following general requirements: (1) complete four core courses in public affairs, Public Affairs 390C, 390E, 392C, and 392D; (2) complete two research methods courses typically taken in the first two years of study; (3) complete three courses in his or her substantive area of research; (4) pass comprehensive qualifying examinations; (5) defend a dissertation proposal; and (6) write and defend a dissertation. A student without a graduate degree from a policy-related academic or professional program may be required to complete supplementary coursework in addition to the number of hours required for the doctoral degree. Additional information on specific requirements and procedures is available from the school.

# Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## Public Affairs: P A

### P A 280E. Gateway to Executive Leadership.

Restricted to students in the executive master's program in the Lyndon B. Johnson School of Public Affairs. Intensive gateway course that serves as a foundation for the executive master's program. Subjects include strategic thinking, global and intergovernmental factors affecting organizational leadership, and ethical leadership. Two lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### P A 280L, 380L. Topics in Public Policy and Law.

Various aspects of policy making, policy development, and communications at a variety of levels. For each semester hour of credit earned, one lecture hour a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Policy Development and Law.** Examines effective policy making at all levels of government, including consideration of the legal process which provides critical context; the policy development process and its relationship to the rule of law; and key elements of public policy development, including ethics, decision making, leadership, and policy implementation.

**Topic 2: Policy and Law Placement.** Thorough examination of ethical issues and professional responsibilities and development of written and oral communication skills that are preparatory for field placement in policy and law.

**Topic 3: Law and Public Policy.** Examines the interconnection of public policy and law and how the two disciplines approach related issues; how legal structures and precedent shape and constrain policy choices; and how public policy informs the work of the courts.

### P A 680P. Policy Research Project.

Interdisciplinary research on a contemporary policy problem involving interaction with sponsoring organizations. Three lecture hours a week for two semesters, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: For 680PA, graduate standing and consent of instructor; for 680PB, Public Affairs 680PA.

### P A 680W. Apprenticeship in Public Policy.

Students work full-time for one whole-term summer semester and the following fall semester. Offered on the letter-grade basis only. Prerequisite: For 680WA, graduate standing and consent of instructor; for 680WB, Public Affairs 680WA.

### P A 381E. Strategic Communications.

Restricted to students in the executive master's program in the Lyndon B. Johnson School of Public Affairs. Topics related to a leader's role in strategic and effective communications with governing boards, legislative bodies, the media, the public, and employees. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

### P A 381W. Foundations of Policymaking.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of graduate adviser.

### P A 882D. Policy Research Project.

Interdisciplinary research on a contemporary policy problem involving interaction with an agency of government. Four lecture hours a week for two semesters. May be repeated for credit when the topics vary. Prerequisite: For 882DA, graduate standing and consent of instructor; for 882DB, Public Affairs 882DA.

### P A 382E. Executive Analytics.

Restricted to students in the executive master's program in the Lyndon B. Johnson School of Public Affairs. Topics in the processes and analytical tools needed for decision-making by senior-level leaders. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

### P A 682G. Policy Research Project on Global Policy Issues.

Interdisciplinary research on a contemporary global policy problem involving interaction with sponsoring organizations. Three lecture hours a week for two semesters, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: For 682GA, graduate standing and consent of instructor; for 682GB, Public Affairs 682GA.

### P A 382W. Policy Analysis Seminar.

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of graduate adviser.

### P A 383C. Policy Development.

Introduction to how public policy is developed and adopted in government systems. Covers the role of politics and institutions in implementing and managing policy. Normally taken during the first year. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### P A 383D. Politics and Process.

Introduction to how public policy develops and is adopted in the American government system. Taught with a videoconference component. Normally taken during the first year. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### P A 383E. Executive Management.

Restricted to students in the executive master's program in the Lyndon B. Johnson School of Public Affairs. Topics in leadership strategy, decision-making, and information management; the understanding and leading of organizational change initiatives for senior-level executives. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing and consent of instructor.

### P A 383G. Policymaking in a Global Age.

History, politics, and organization of how the United States makes and implements foreign policy decisions. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### P A 384C. Public Management.

Covers the development and implementation of policy within an organizational environment, including the role of political and institutional factors, organization and management concepts, and human information

resource issues. Normally taken during the first year. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **P A 384D. Public Management.**

Covers the development and implementation of policy within an organization environment, including the role of political and institutional factors, organization and management concepts, and human information resource issues. Normally taken during the first year. Three lecture hours a week for one semester. May have a distance learning component. Prerequisite: Graduate standing.

#### **P A 387G. The Nature of the International System.**

Introduces systematic analysis of global policy, factors that motivate foreign policies and private decisions, and instruments used in the conduct of international relations. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **P A 387K. Advanced Topics in Public Policy.**

Issues in political values and ethics and in natural resources, transportation, health, environmental, international, regulatory, urban, and labor and human resources policy. Three lecture hours a week for one semester. Some topics may be taught via Web-based instruction with no class meetings. Public Affairs 387K and 388K may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Offered on the letter-grade basis only. Prerequisite: Graduate standing.

#### **P A 388D. Advanced Topics in Public Policy.**

Typical topics include issues in political values and ethics and issues in transportation, health, environmental, international, regulatory, urban, and labor and human resources policy. Three lecture hours a week for one semester. Some topics may be taught via Web-based instruction with no class meetings. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

**Topic 1: Perspectives on Public Policy.** Covers the art and science of policy formulation in the areas of economics, national security, monetary policy, science, technology, and trade. Examines the relationships among policy development processes at the federal, state, and local levels of government.

**Topic 2: Politics and Policies in an Aging Population.**

**Topic 3: Texas Health Policy.**

#### **P A 188G. Topics in Global Policy Studies.**

Three lecture hours a week for five weeks, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### **P A 388K. Advanced Topics in Public Policy.**

Typical topics include issues in political values and ethics and in natural resources, transportation, health, environmental, international, regulatory, urban, and labor and human resources policy. Three lecture hours a week for one semester. Some topics may be taught via Web-based instruction with no class meetings. Public Affairs 387K and 388K may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### **P A 388L. Advanced Topics in Management.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

#### **P A 188S. Advanced Topics in Public Policy.**

Three lecture hours a week for five weeks, or as required by the topic. May be repeated for credit when the topics vary. Offered on the credit/no credit basis only. Prerequisite: Graduate standing.

#### **P A 389. Conference Course in Policy Analysis.**

Individual instruction related to selected aspects of professional theory and practice. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

#### **P A 189C. Independent Study in Public Policy.**

Individual instruction related to selected aspects of professional theory and practice. The equivalent of one lecture hour a week for one semester. May be repeated for credit. Prerequisite: Graduate standing, consent of instructor and the graduate adviser.

#### **P A 389E. Research Capstone.**

Restricted to students in the executive master's program in the Lyndon B. Johnson School of Public Affairs. Integrative independent study organized around a project requiring students to draw upon previous studies, academic research, and practical applications. The equivalent of three lecture hours a week for one semester. May be repeated for credit. Offered on the letter-grade basis only.

#### **P A 390C. Advanced Research Methods.**

Study of research methods, with a focus on those needed by doctoral students in public policy. Includes discussions of broad controversies in social science methodology and subjects not commonly covered in other first-year graduate courses. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

#### **P A 390D, 690D, 990D. Dissertation Proposal Preparation.**

Development and preparation of the dissertation proposal. Individual instruction. Offered on the credit/no credit basis only. Prerequisite: Graduate standing, completion of all coursework, and consent of instructor.

#### **P A 390E. Research Design.**

Designed to provide a structured framework in which students can develop and apply methods training and produce a research paper. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

#### **P A 190G. Writing for Global Policy Studies.**

Instruction in the writing styles appropriate for professional careers in international settings. Three lecture hours a week for five weeks, or as required by the topic. May be repeated for credit, but only three semester hours may be counted toward the Master of Global Policy Studies degree. Prerequisite: Graduate standing and consent of the graduate adviser.

#### **P A 391. Public Financial Management.**

The budget process, budgetary methods, governmental accounting analysis of financial statements, government revenues, debt management, and other financial management techniques for public and nonprofit programs. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### **P A 392C. Theory and Philosophy of Public Policy I.**

Explores the theoretical foundations of public policy. Includes political philosophy concepts and various theoretical approaches to the policy-making process. Three lecture hours a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

#### **P A 392D. Theory and Philosophy of Public Policy II.**

Three lecture hours a week for one semester. Prerequisite: Graduate standing, Public Affairs 392C, and consent of the graduate adviser.

**P A 393G. Microeconomics.**

Principles of markets and market failures relevant to global policy studies. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**P A 393H. International Economics.**

Comparative advantage, international trade, international trade institutions, and agreements. Three lecture hours a week for one semester. Prerequisite: Graduate standing and Public Affairs 393G.

**P A 393K. Applied Microeconomics for Policy Analysis.**

The use of economic reasoning in the development and implementation of public policy. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

**P A 393L. Advanced Policy Economics.**

Advanced topics in the application of economic reasoning to the development and implementation of policy. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and Public Affairs 393K.

**P A 095. Public Affairs Colloquium.**

Guest lectures on topics to be announced. One lecture hour a week for one semester. Prerequisite: Graduate standing and consent of instructor and the graduate adviser.

**P A 195C. Supervised Policy Research.**

Supervised, individual policy research experience on a topic chosen by the supervising faculty member. Conference course. Prerequisite: Graduate standing in public affairs and approval of the research proposal by the supervising faculty member and the graduate adviser.

**P A 195G. Global Policy Simulation.**

Supervised role-playing exercises on global policy. The equivalent of one lecture hour a week for one semester; additional hours may be required. Prerequisite: Graduate standing.

**P A 195W. Policy Simulation.**

Restricted to students in the Public Affairs DC and Global Policy Studies DC programs. Supervised role-playing exercises on public policy. The equivalent of one lecture hour a week for one semester; additional hours may be required. Prerequisite: Graduate standing.

**P A 196C. Supervised Public Service.**

Supervised, individual practical public service experience in an area chosen by the supervising faculty member. Conference course. May not be counted toward the Master of Public Affairs degree. Prerequisite: Graduate standing in public affairs and approval of proposal by the supervising faculty member and the graduate adviser.

**P A 396G. Internship in Global Policy Studies.**

Supervised participation in and observation of international issues as a working member of the staff in an agency of government, a nonprofit organization, or a public policy-related unit in the private sector. At least 400 hours of work over one semester. Prerequisite: Graduate standing, completion of one year in the Lyndon B. Johnson School of Public Affairs, and consent of the associate dean.

**P A 396K. Internship in Public Policy.**

Supervised participation and observation as a working member of the staff in an agency of government, a nonprofit organization, or a public policy-related unit in the private sector. Students work full time for one summer session or long-session semester. Offered on the credit/no credit

basis only. Prerequisite: Completion of one year in the Lyndon B. Johnson School of Public Affairs and consent of the associate dean.

**P A 397. Introduction to Empirical Methods for Policy Analysis.**

Survey of the application of a broad range of quantitative models to policy analysis and managerial decision-making: optimization techniques based on calculus and linear programming, probability theory and decision analysis, sampling theory and hypothesis testing, regression analysis, and forecasting. Three lecture hours a week for one semester. Prerequisite: Graduate standing; and either one semester each of college algebra, calculus, and statistics or a passing score on the validation exam offered before the beginning of the semester.

**P A 397C. Advanced Empirical Methods for Policy Analysis.**

Research methods, specialized empirical techniques, and data analysis as used in policy analysis and management. Three lecture hours a week for one semester. Some topics may be taught via Web-based instruction with no class meetings. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and Public Affairs 397.

**P A 397D. Applied Quantitative Analysis I.**

Three lecture hours a week for one semester. Survey of the application of a broad range of quantitative models to policy analysis and managerial decision-making: optimization techniques based on calculus and linear programming, probability and theory and decision analysis, sampling theory and hypothesis testing, regression analysis, and forecasting. Prerequisite: Graduate standing; and either one semester each of college algebra, calculus, and statistics or a passing score on the validation exam offered before the beginning of the semester.

**P A 397G. Analytical Methods for Global Policy Studies.**

Descriptive statistics, inference, multivariate regression, qualitative methods, and case study methods applicable to global policy research. Three lecture hours a week for one semester. Prerequisite: Graduate standing, and an undergraduate statistics course or a passing score on the validation exam.

**P A 098J. Joint Programs with Partner Institutions.**

Certification course for students enrolled in Lyndon B. Johnson School of Public Affairs interdisciplinary joint degree programs. Prerequisite: Graduate standing.

**P A 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in public affairs and consent of the graduate adviser.

**P A 198T, 398T. Supervised Teaching in Public Affairs.**

Group meetings with the instructor, individual consultations, and reports. Mandatory for students seeking teaching assistant positions. For each semester hour of credit earned, one lecture hour a week for one semester. Prerequisite: Graduate standing and consent of the graduate adviser.

**P A 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree and consent of the graduate adviser in public affairs.

**P A 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Public Affairs 399R, 699R, or 999R.

# School of Social Work

*Master of Science in Social Work  
Doctor of Philosophy*

## For More Information

**Campus address:** School of Social Work Building (SSW) 2.222, phone (512) 471-5457, fax (512) 471-9600; campus mail code: D3500

**Mailing address:** The University of Texas at Austin, School of Social Work, 1925 San Jacinto Boulevard Stop D3500, Austin TX 78712

**E-mail:** [utssw@lists.cc.utexas.edu](mailto:utssw@lists.cc.utexas.edu)

**URL:** <http://www.utexas.edu/ssw/>

## Facilities for Graduate Work

The School of Social Work Building houses classrooms, faculty and administrative offices, and a student lounge. The building also houses the school's Learning Resource Center, which contains computer and video laboratories and reading rooms; the center provides an extensive reference library of social work-related journals and other materials.

The school offers students several other services and resources, including the Office of Academic Affairs, which coordinates advising, registration, and other academic matters. Career planning is available through the DiNitto Center for Career Services. The Center for Social Work Research administers faculty-conducted research in such areas as substance abuse and mental health; child welfare; cultural diversity; domestic and community violence; gerontology; families, children, and youth; social work education; and organizational structures.

## Areas of Study

The School of Social Work offers graduate study leading to the Master of Science in Social Work and the Doctor of Philosophy with a major in social work.

The Master of Science in Social Work program prepares students for advanced social work practice with individuals, families, groups, organizations, and communities, as well as for policy-related and administrative positions. Two areas of concentration are available: clinical social work or administration and policy practice.

Students pursuing the Doctor of Philosophy degree design their own areas of study based on their academic and research interests.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Terrence Allen  
Marilyn Armour  
Noel B Busch-Armendariz  
Esther Calzada  
Yessenia Castro  
Namkee Choi  
Allan H Cole Jr  
Catherine Cubbin  
Susan De Luca  
Diana M Dinitto  
Michael J Ferguson  
Rowena Fong  
Cynthia G Franklin  
Dorie J Gilbert  
Lauren E Gulbas  
Lori K Holleran  
Yuri Jang

Barbara L Jones  
Jane A Kretzschmar  
Michael L Lauderdale  
Angela M Nonaka  
Yolanda C Padilla  
Elizabeth C Pomeroy  
Michele A Rountree  
Christopher P Salas-Wright  
Arthur J Schwab Jr  
Clayton T Shorkey  
David W Springer  
Calvin L Streeter  
Sanna Thompson  
Mary M Velasquez  
Kirk L Von Sternberg  
Ahmed Whitt  
Luis H Zayas

## Admission Requirements

### Master of Science in Social Work

Applicants for admission to this degree program should have a general liberal arts education with a broad range of studies in the behavioral sciences. All applicants must have completed at least one college-level statistics course that includes inferential applications.

Applicants with a Bachelor of Social Work degree from a school accredited by the Council on Social Work Education may be admitted into a modified program of study.

### Doctor of Philosophy

Applicants to the doctoral degree program must have a master's degree from an accredited school of social work, or a master's degree in a related discipline with extensive experience in human services. Preference is given to individuals with at least two years of professional experience beyond the master's degree.

## Degree Requirements

Approval of the graduate adviser is required for registration in any social work courses.

### Master of Science in Social Work

Developed in accordance with Council on Social Work Education curriculum standards and policies, the full-time Master of Science in Social Work degree program requires sixty semester hours of coursework. Experiential learning is provided through internships in selected government, nonprofit, and for-profit agencies. Course content and field experiences are organized and integrated using a systems/developmental framework and a biopsychosocial perspective.

Of the sixty semester hours required for graduation, a maximum of twenty-four may be accepted by waiver from an accredited Bachelor of Social Work or Master of Social Work program. Waivers are awarded only after careful evaluation by the faculty of a student's training and experience in the areas in which waivers are sought.

Most students enroll in the regular full-time program, which can be completed in two academic years. Extended and part-time programs of work can be completed in two and one-half to three and one-half years. Students accepted into a modified program of study complete a forty-two to forty-eight-semester-hour program in twelve to sixteen months. Each option provides students with opportunities to study independently with individual faculty members, and to take elective courses in other

University departments. The school offers required courses during evening hours but cannot guarantee that the degree program can be completed by taking courses only at night.

## Doctor of Philosophy

Students seeking the doctoral degree must meet the following requirements:

1. Completion of a program of courses prescribed by the Graduate Studies Committee.
2. Completion of a written comprehensive examination that tests the student's knowledge of theory, research design and methodology in social work, and of selected aspects of social work practice.
3. Completion of an acceptable program of original research, including the submission of a dissertation that extends the knowledge base of social work.
4. Satisfactory performance on an oral examination in defense of the dissertation.

Students should consult the graduate adviser for additional requirements.

## Dual Degree Programs

### Master of Science in Social Work/Master of Divinity

The graduate program in social work offers a dual degree program with the Austin Presbyterian Theological Seminary (APTS). Applicants must apply separately and be admitted to both the Master of Science in Social Work program at UT Austin and the Master of Divinity program at APTS. The degrees are conferred separately by each institution. Additional information is available from the director of admissions at the School of Social Work.

### Master of Science in Social Work/Master of Public Health

The graduate program in social work offers a dual degree program with the University of Texas Health Science Center at Houston School of Public Health (UTSPH). Applicants must apply separately and be admitted to both the Master of Science in Social Work program at UT Austin and the Master of Public Health at UTSPH. Students accepted into the dual degree program complete the three-year program of work in both schools. The degrees are conferred separately by each institution. Additional information is available from the director of admissions at the School of Social Work.

In addition, the School of Social Work offers the following dual degree programs in cooperation with other divisions of the University. More information is available from the graduate adviser in each program.

Field(s) of Study	Degree(s)
Latin American Studies	Master of Arts
Law	Doctor of Jurisprudence
Public affairs	Master of Public Affairs

## Graduate Courses

Professional liability insurance is required and a criminal background check may be required of all students enrolled in field placement or internship courses. The insurance policy must cover the duration of the course, beginning on or before the first regular class period.

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught

each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## Social Work: S W

### S W 381R. Human Behavior and the Social Environment.

Focuses on empirically based theories and conceptual approaches that form the foundation for social work practice and research with individuals and families in social systems. Three lecture hours a week for one semester. Prerequisite: Graduate standing in social work, or graduate standing and consent of instructor or the graduate adviser.

### S W 381S. Foundations of Social Justice: Values, Diversity, Power, and Oppression.

History, demographics, and cultures of various populations at risk with an emphasis on self-awareness and understanding the impact of discrimination and oppression by individuals and society on people of diverse backgrounds, abilities, and orientations. Three lecture hours a week for one semester. Prerequisite: Graduate standing in social work, or graduate standing and consent of instructor or the graduate adviser.

### S W 381T. Dynamics of Organizations and Communities.

The organizational and community context within which social services are delivered and the influence of funding, mandate, and organizational arrangements on service delivery, with attention given to populations at risk. Three lecture hours a week for one semester. Prerequisite: Graduate standing in social work, or graduate standing and consent of instructor or the graduate adviser.

### S W 382R. Social Policy Analysis and Social Problems.

Historical perspective on the development of social welfare institutions, programs, and policies. Students study methods of current policy analysis and evaluation of social problems. Three lecture hours a week for one semester. Prerequisite: Graduate standing in social work, or graduate standing and consent of instructor or the graduate adviser.

### S W 383R. Social Work Practice I.

Introduction to social work practice methodology and the professional use of self in generalist practice with individuals, families, groups, organizations, and communities. Three lecture hours a week for one semester. Prerequisite: Graduate standing in social work and concurrent enrollment in Social Work 384R, or graduate standing and consent of instructor or the graduate adviser.

### S W 383T. Social Work Practice II.

Students examine, critique, select, and apply social work micro, mezzo, and macro theories and methods in advanced clinical and community practice. Three lecture hours a week for one semester. Prerequisite: Graduate standing in social work and concurrent enrollment in Social Work 384S, or graduate standing and consent of instructor or the graduate adviser.

### S W 384R. Field Instruction I.

Practice course based on supervised assignments designed to develop a social work perspective and skill in working with individuals, families, groups, organizations, and communities. Sixteen to twenty hours a week (a total of at least 240 hours) in field placement and a weekly one-hour integrative seminar in the application of theoretical material to practice problems and to special issues. One lecture hour and sixteen to twenty hours of fieldwork a week for one semester. Social Work 384R and 384S must be taken in consecutive semesters. Prerequisite: Graduate standing in social work and concurrent enrollment in Social Work 383R,

or graduate standing and consent of the field director or the graduate adviser.

### **S W 384S. Field Instruction II.**

Continuation of Social Work 384R. Sixteen to twenty hours a week (a total of at least 240 hours) in field placement and a weekly one-hour integrative seminar that emphasizes advanced application of theory to practice and to consideration of special issues. One lecture hour and sixteen to twenty hours of fieldwork a week for one semester. Social Work 384R and 384S must be taken in consecutive semesters. Prerequisite: Graduate standing in social work and concurrent enrollment in Social Work 383T, or graduate standing and consent of the field director or the graduate adviser.

### **S W 385R. Social Work Research Methods.**

Study of the scientific method and the use of research as a tool for professional practice. Three lecture hours a week for one semester. Prerequisite: Graduate standing in social work, or graduate standing and consent of instructor or the graduate adviser.

### **S W 385T. Advanced Integrative Capstone in Social Work Knowledge and Practice.**

Applies knowledge, skills, and theories to values and ethics, diversity, populations at risk, social and economic justice, human behavior and the social environment, social welfare policy, social work practice, research, and field education. Designed to be taken concurrently with Social Work 694R. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

### **S W 387C. Direct Practice Field Immersion.**

Students work in a professional agency assisting clients. One weekly seminar hour and at least eight hours of fieldwork a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in social work and consent of instructor or the graduate adviser.

### **S W 387R. Topics in Special Issues.**

Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in social work, or graduate standing and consent of instructor or the graduate adviser.

**Topic 1: Loss and Grief: Individual and Family Perspectives.**

**Topic 12: Contemporary Issues in Foster Care and Adoption.**

**Topic 13: Aging and Disability.** Web-based instruction; no class meetings.

**Topic 14: Family Support, Self-Determination, and Disability.** Web-based instruction; no class meetings.

**Topic 15: Introduction to Gerontology.**

**Topic 16: Developmental Disabilities and Self-Advocacy.** Web-based instruction; no class meetings.

**Topic 17: Making Systems Work for People with Disabilities.** Web-based instruction; no class meetings.

**Topic 18: The Social Construction of Disability.** Web-based instruction; no class meetings.

**Topic 19: Spirituality in Social Work Practice.**

**Topic 20: Dynamics of Substance Use Disorders.**

**Topic 22: Social Work in the School Setting.**

**Topic 23: Social Work Practice with Older Adults.**

**Topic 24: Constitutional Law for Social Workers.**

**Topic 25: Social Work in the Legal System.**

**Topic 26: Spanish for Social Workers.** Additional prerequisite: Demonstrated proficiency in Spanish.

**Topic 27: Women with Disabilities.** Web-based instruction; no class meetings.

**Topic 28: Health and Psychosocial Factors.**

**Topic 29: The Built Environment and Public Health.**

**Topic 30: Contemporary Practice with Older Adults.**

**Topic 31: Kinship Care: Children and Family Systems.**

**Topic 32: Psychosocial Oncology Practice and Research.**

**Topic 33: Child and Adult Attachment in Clinical Practice.**

**Topic 35: Ethical Dilemmas in Social Work Practice.**

**Topic 36: Social Work in Health Care.**

**Topic 38: Social Work with Military Personnel and Families.** Social Work 387R (Topic 37) and 387R (Topic 38) may not both be counted.

**Topic 39: Parenting Interventions for Diverse Populations.**

**Topic 40: Mindfulness and Social Work Practice.**

### **S W 388R. Seminar: Advanced Research in Social Work.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in social work and consent of instructor and the graduate adviser.

**Topic 1: Research Methods I.** Introduction to the basic elements of research design in the social sciences, with particular attention to social work research. Required of all doctoral students in social work.

**Topic 2: Research Methods II.** Quantitative research methods as they are applied in the social and behavioral sciences. Designed to provide students with the knowledge and competence in quantitative research methods required to conduct independent research that will expand the knowledge base of the profession. Focuses on the application of concepts studied in Topic 1 and includes research design, measurement in social science, statistical power analysis, effect size, multivariate data analysis, computer applications for data analysis, proposal writing, and research ethics. Required of all doctoral students in social work.

**Topic 3: Research Methods III.** Introduction to qualitative research methodologies, paradigms, epistemologies, and theories. Qualitative methods of inquiry, including research designs, specific data collection methods, and analytic and interpretive procedures. Discussion of several approaches to qualitative data collection and analysis. Required of all doctoral students in social work.

**Topic 6: Data Analysis I.** Introduction to fundamental concepts and statistical procedures used in social work research and to computer applications used for data analysis. Designed to help students develop basic skills in data file construction and manipulation, data definition, and statistical analysis and the conceptual and mathematical understanding of statistics needed for advanced work in research design, model development, model fitting and estimation, hypothesis testing, multivariate techniques, and interpretation of data. Basic statistical concepts through specific parametric and nonparametric statistics. Required of all doctoral students in social work.

**Topic 7: Data Analysis II.** Builds on the concepts and procedures introduced in Topic 6. Designed to enable students to do data analysis using multivariate statistical procedures. Primary focus on using the SPSS statistical software package for calculating multivariate statistics and on using the statistical output in research findings. Required of all doctoral students in social work.

**Topic 8: Advanced Qualitative Data Analysis.** Restricted to doctoral students. An elective course for doctoral students who want additional training in qualitative methods. Focus on the epistemological and practical issues of analyzing qualitative data and writing up the results. Students must have access to pre-collected data for analysis or consult with instructor about a suitable project. May be used to fulfill the advanced research or statistical methods elective requirement. Additional prerequisite: Consent of instructor.

**Topic 9: Secondary Data Analysis.** Restricted to doctoral students. Introduction to the advantages and challenges of working with secondary data, involving hands on experience with the preparation and data analysis of large data sets. Subjects include the basics of Confirmatory Factor Analysis, Structural Equation Modeling, and Multi-



group analyses using AMOS software. Three lecture hours a week for one semester, with additional hours to be arranged. May be counted toward advanced research or statistical methods course or elective. Additional prerequisite: Graduate standing, Social Work 388R (Topic 6), and 388R (Topic 7).

### **S W 390N. Seminar: Strategies of Intervention.**

A critical evaluation of social work intervention strategies in human services, using alternative theoretical perspectives. Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in social work, or graduate standing and consent of instructor and the graduate adviser.

**Topic 2: Theories of Social Work Practice.** Conceptualization, development, and application of social work theory. Philosophical, theoretical, and empirical underpinnings of different practice theories are investigated. Emphasis placed on understanding and critically analyzing the philosophical assumptions and scientific basis of various theories. Required of all doctoral students in the School of Social Work. Additional prerequisite: Graduate standing.

### **S W 392R. Topics in Social Welfare Policy Analysis.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in social work, or graduate standing and consent of instructor or the graduate adviser.

**Topic 1: Integrated Health Care Policy.**

**Topic 2: Children and Families.**

**Topic 3: Poverty and Public Policy.**

**Topic 4: Social Policy for the Aging Population.**

### **S W 393R. Topics in Advanced Clinical Practice.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in social work, or graduate standing and consent of instructor or the graduate adviser.

**Topic 1: Clinical Assessment and Differential Diagnosis.**

**Topic 3: Theories and Methods of Family Intervention.**

**Topic 9: Assessment and Treatment of Traumatized Populations.**

**Topic 11: Clinical Intervention with Intergenerational Families Giving Care.**

**Topic 13: Cognitive-Behavioral Therapy.**

**Topic 14: Counseling African American Individuals, Couples, and Families.**

**Topic 15: Couples Counseling.**

**Topic 16: Coexisting Psychiatric and Substance Use Disorders.**

**Topic 18: Grief Counseling.**

**Topic 20: Methods of Play Intervention.**

**Topic 21: Motivational Interviewing.**

**Topic 22: Neurobiology and Social Work Practice.**

**Topic 23: Treatment of Substance Use Disorders.**

**Topic 24: Treatment of Children and Adolescents.**

**Topic 26: Theories and Methods of Group Intervention.**

**Topic 29: Crisis Intervention.**

**Topic 30: Solution-Focused Brief Therapy.**

### **S W 393T. Topics in Advanced Macro Practice.**

The equivalent of three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in social work, or graduate standing and consent of instructor or the graduate adviser.

**Topic 8: Community Engagement and Management of Volunteers.**

**Topic 9: Community Organizing and Social Change.**

**Topic 10: Grant Development and Resource Development.**

**Topic 11: International Social Work.**

**Topic 14: Psychiatric Disabilities: From the Inside Out.** Web-based instruction; no class meetings.

**Topic 16: Social Work Leadership in Human Service Systems.**

**Topic 17: Human Resource Development.**

**Topic 18: Nonprofit Management in Human Services.**

**Topic 19: Strategic Partnerships.**

**Topic 20: Information Systems and Communication in Social Work.**

**Topic 21: Applied Policy Practice.**

**Topic 22: Community Building.**

**Topic 23: Advanced Policy Practice.**

**Topic 25: Social Change and Community Practice.**

**Topic 26: Cross-Disciplinary Global Project Development in the United States and Abroad.**

**Topic 28: Program Evaluation.** Social Work 393T (Topic 27) and 393T (Topic 28) may not both be counted. Offered on the letter-grade basis only.

### **S W 393U. Topics in Social Justice and Populations at Risk.**

Three lecture hours a week for one semester, or as required by the topic. May be repeated for credit when the topics vary. Prerequisite: Graduate standing in social work, or graduate standing and consent of instructor or the graduate adviser.

**Topic 1: Social Work Practice with Abused and Neglected Children and Their Families.**

**Topic 3: Working with Youth Gangs.**

**Topic 4: Social Work Practice with African American Families.**

**Topic 5: Social Work Practice with Mexican American Families.**

**Topic 10: Women and Substance Use Disorders: Contemporary Issues.**

**Topic 16: Assessment and Treatment of Juvenile Offenders.**

**Topic 17: Gays and Lesbians in American Society: Policy and Practice.**

**Topic 18: Restorative Justice.**

**Topic 20: Cultural Factors in Substance Abuse Treatment for Underserved Populations.**

**Topic 21: Social Work Practice with Asian American Families.**

**Topic 22: Contemporary Issues in Domestic Violence.**

**Topic 23: Contemporary Issues and Practice in Sexual Assault.**

**Topic 24: Advanced Issues in Social and Economic Justice.**

**Topic 25: Historical Cultural Trauma.**

**Topic 26: Youth, Delinquency, and Juvenile Justice.**

**Topic 27: Social Inequalities in Health.**

**Topic 28: Social Work and the Latino Population.**

**Topic 30: Culturally Sensitive Service Provision with Latino Populations.** Social Work 393U (Topic 29) and 393U (Topic 30) may not both be counted.

### **S W 393V. Topics in Social Work in Specific Settings.**

Three lecture hours a week for one semester. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor or the graduate adviser.

### **S W 694R. Advanced Field Instruction.**

Supervised practicum, building on Social Work 384R and 384S, in the continued application of theory to practice at an advanced level within the student's chosen concentration. Designed to be taken concurrently with Social Work 385T. Social Work 694R and 394S can be taken concurrently in one semester to provide thirty-six hours of work a week (a total of at least 540 hours in one semester) in a social work agency or organization, or they can be taken over two semesters to provide sixteen to twenty hours of work a week (a total of at least 540 hours in two semesters) in the same agency. Offered on the credit/no credit basis only. Prerequisite:

Graduate standing in social work, consent of field director, and consent of graduate adviser.

#### **S W 394S. Advanced Field Instruction.**

Supervised practicum, building on Social Work 384R and 384S, in the continued application of theory to practice at an advanced level within the student's chosen concentration. Social Work 694R and 394S can be taken concurrently in one semester to provide thirty-six hours of work a week (a total of at least 540 hours in one semester) in a social work agency or organization, or they can be taken over two semesters to provide sixteen to twenty hours of work a week (a total of at least 540 hours in two semesters) in the same agency. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in social work, consent of field director, and consent of graduate adviser.

#### **S W 195K, 295K, 395K, 495K. Conference Course in Social Work.**

Individual study in selected aspects of professional theory and practice. Conference course. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor or the graduate adviser.

#### **S W 395L. Research Practicum.**

Individually supervised research experience. Individual instruction. May be counted towards the advanced research or statistical methods requirement. Prerequisite: Graduate standing.

#### **S W 195Q. Colloquium on Issues in Social Work Education and Research.**

Restricted to doctoral students in social work. Exposure to the diversity of research topics and methods pursued by researchers and academicians in social work education and allied fields. Conference course. May be counted twice. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the instructor or the graduate adviser.

#### **S W 395S. Area of Specialization Course.**

Designed to help students demonstrate knowledge in the substantive issues, key research questions, theory, empirical evidence, and implications in their area of specialization. The equivalent of three lecture hours a week for one semester. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

#### **S W 395W. Writing Practicum.**

Individually supervised development of publishable written material. Individual instruction. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

#### **S W 398T. Pedagogy in Social Work.**

Social work curriculum policy and issues, course development and content, teaching techniques, and classroom management. Emphasis on teaching skills as well as conceptual content and theory. Three lecture hours a week for one semester. Required of all doctoral degree students in social work. Students must complete this course before they may be appointed as assistant instructors in the School of Social Work. Prerequisite: Graduate standing in social work and consent of instructor or the graduate adviser.

#### **S W 399R, 699R, 999R. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

#### **S W 399W, 699W, 999W. Dissertation.**

Offered on the credit/no credit basis only. Prerequisite: Social Work 399R, 699R, or 999R.

## **Intercollegial Programs Computational Science, Engineering, and Mathematics**

*Master of Science in Computational  
Science, Engineering, and Mathematics  
Doctor of Philosophy*

### **For More Information**

**Campus address:** Peter O'Donnell Building (POB) 4.102A, phone (512) 232-3356, fax (512) 471-8694; campus mail code: C0200

**Mailing address:** The University of Texas at Austin, Graduate Program in Computational Science, Engineering, and Mathematics, 201 East 24th Street C0200, Austin TX 78712-1229

**E-mail:** [camgrad@ices.utexas.edu](mailto:camgrad@ices.utexas.edu)

**URL:** <http://www.ices.utexas.edu/graduate-studies/>

### **Facilities for Graduate Work**

Support facilities for work in computational science, engineering, and mathematics include the Kuehne Physics Mathematics Astronomy Library, the Mallet Chemistry Library, the Walter Geology Library, the Perry-Castañeda Library, and the Life Science Library. Extensive computing facilities are available, including the POB scientific visualization laboratory and an Ethernet network supporting more than 300 general-purpose Linux, SGI, IBM, and Apple workstations. Other computational resources include several distributed memory computer clusters, each with between 16 and 256 cores. Faculty members, research staff, and graduate students also have access to large-scale supercomputing resources of the Texas Advanced Computing Center (TACC).

### **Areas of Study**

Graduate study in computational science, engineering, and mathematics comprises three areas: applicable mathematics, numerical analysis and scientific computation, and mathematical modeling and applications. Within these broad areas, the student may take courses and conduct research in numerical analysis and scientific computing, applicable mathematics, computational mechanics and physics, parallel computing and computer architecture, and mathematical modeling, and in supporting areas in engineering and science that involve mathematical modeling of physical phenomena and engineering systems.

### **Graduate Studies Committee**

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Behcet Acikmese  
Todd J Arbogast  
Ivo M Babuska  
Chandrajit L Bajaj  
Efsthios Bakolas  
Michael Baldea  
William Beckner  
George Biros  
James C Browne  
Tan T Bui  
Luis A Caffarelli  
James R Chelikowsky  
Clinton N Dawson  
Mojdeh Delshad  
Alexander A Demkov  
Leszek F Demkowicz  
Inderjit S Dhillon  
Ron Elber  
Bjorn Engquist  
Sergey B Fomel  
John Timothy Foster  
Irene M Gamba  
Omar Ghattas  
Oscar Gonzalez  
Patrick Heimbach  
Graeme A Henkelman  
Marc A Hesse

Thomas J Hughes  
Loukas F Kallivokas  
Aida Khajavirad  
Chad M Landis  
Dmitrii E Makarov  
Edward M Marcotte  
Mark E Mear  
Robert D Moser  
Peter Mueller  
J T Oden  
Dewayne E Perry  
Keshav K Pingali  
William H Press  
Serge M Prudhomme  
Pradeep Ravikumar  
Kui Ren  
Gregory J Rodin  
Michael S Sacks  
Sanjay Srinivasan  
Yen-Hsi Tsai  
Robert A Van De Geijn  
Philip L Varghese  
Zheng Wang  
Rachel A Ward  
Mary F Wheeler  
Ali E Yilmaz

A dissertation is required of every candidate, followed by a final oral examination covering the dissertation and the general field of the dissertation.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Computational Science, Engineering, and Mathematics: CSE

#### CSE 380. Tools and Techniques of Computational Science.

Advanced introduction to the practical use of high performance computing hardware and software engineering principles for scientific technical computing. Topics include computer architectures, operating systems, programming languages, data structures, interoperability, and software development, management, and performance. Three lecture hours a week for one semester. Prerequisite: Graduate standing.

#### CSE 382G. Computer Graphics.

Same as Computer Science 384G. Advanced material in computer graphics, including in-depth treatments of techniques for realistic image synthesis, advanced geometric modeling methods, animation and dynamic simulation, scientific visualization, and high-performance graphics architectures. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 384G, Computational Science, Engineering, and Mathematics 382G, Computer Science 384G. Prerequisite: Graduate standing; and Computer Science 354 or another introductory course in computer graphics, or equivalent background and consent of instructor.

#### CSE 383C. Numerical Analysis: Linear Algebra.

Same as Computer Science 383C, Mathematics 383E, and Statistics and Data Sciences 393C. Survey of numerical methods in linear algebra: floating-point computation, solution of linear equations, least squares problems, algebraic eigenvalue problems. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 383C, Computational Science, Engineering, and Mathematics 383C, Computer Science 383C, Mathematics 383E, Statistics and Data Sciences 393C, Statistics and Scientific Computation 393C. Prerequisite: Graduate standing; Computer Science 367 or Mathematics 368K; and Mathematics 340L, 341, or consent of instructor.

#### CSE 383D. Numerical Analysis: Interpolation, Approximation, Quadrature, and Differential Equations.

Same as Computer Science 383D, Mathematics 383F, and Statistics and Data Sciences 393D. Survey of numerical methods for interpolation, functional approximation, integration, and solution of differential equations. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 383D, Computational Science, Engineering, and Mathematics 383D, Computer Science 383D, Mathematics 383F, Statistics and Data Sciences 393D, Statistics and Scientific Computation 393D. Prerequisite: Graduate standing; Computational Science, Engineering, and Mathematics 383C (or Computational and Applied Mathematics 383C), Computer Science 383C, Mathematics 383E, or Statistics and Data Sciences 393C (or Statistics and Scientific Computation 393C); and Mathematics 427K and 365C, or consent of instructor.

## Admission Requirements

Students entering the program are expected to have an undergraduate degree in engineering, computer sciences, mathematics, or a natural science such as biology, physics, or chemistry.

## Degree Requirements

Each student develops a program of study that includes a substantial component in each of three areas of concentration: applicable mathematics, numerical analysis and scientific computation, and mathematical modeling for applications in a science or engineering discipline. The program must be reviewed and approved by the Graduate Studies Committee. Lists of courses in the three concentrations are available from the graduate adviser.

## Master of Science in Computational Science, Engineering, and Mathematics

This program requires completion of thirty semester hours of approved coursework, including a thesis; thirty-three semester hours of approved coursework, including a report; or thirty-six hours of approved coursework. At least twenty-four hours must be chosen from courses in the three concentration areas, with at least six hours from each area. These twenty-four hours of approved coursework must be taken on the letter-grade basis.

## Doctor of Philosophy

Before admission to candidacy for the degree, each student develops a program of study that draws courses from each of the three areas of concentration; the program must be approved by the Graduate Studies Subcommittee. The student must also pass an examination in each area. In addition to meeting the area requirements, the student must prepare a written dissertation proposal. Oral presentation of the proposal and an oral examination are required.

**CSE 383K. Numerical Analysis: Algebra and Approximation.**

Same as Mathematics 387C. Advanced introduction to scientific computing, theory and application of numerical linear algebra, solution of nonlinear equations, and numerical approximation of functions. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 386K, Computational Science, Engineering, and Mathematics 383K, Mathematics 387C. Prerequisite: Graduate standing, and consent of instructor or the graduate adviser.

**CSE 383L. Numerical Analysis: Differential Equations.**

Same as Mathematics 387D. Advanced introduction to the theory and practice of commonly used numerical algorithms for the solution of ordinary differential equations, and elliptic, parabolic, and hyperbolic partial differential equations. Three lecture hours a week for one semester. Prerequisite: Graduate standing; and Computer Science 383C, Mathematics 387C (or 383G), or consent of instructor.

**CSE 383M. Statistical and Discrete Methods for Scientific Computing.**

Studies in probabilistic and statistical inference, statistical model fitting, computational geometry, image processing, computational graph theory, and information theory. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 383M, 395T (Topic: Computational Statistics with Application to Bioinformatics), Computational Science, Engineering, and Mathematics 383M. Prerequisite: Graduate standing.

**CSE 384K. Theory of Probability.**

Same as Mathematics 385C. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 384K, Computational Science, Engineering, and Mathematics 384K, Mathematics 385C. Prerequisite: Graduate standing and consent of instructor.

**CSE 384L. Theory of Probability.**

Same as Mathematics 385D. Continuation of Computational Science, Engineering, and Mathematics 384K and Mathematics 385C. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 384L, Computational Science, Engineering, and Mathematics 384L, Mathematics 384L, 385D. Prerequisite: Graduate standing; Computational Science, Engineering, and Mathematics 384K (or Computational and Applied Mathematics 384K) or Mathematics 385C; and consent of instructor.

**CSE 384R. Mathematical Statistics I.**

Same as Mathematics 384C and Statistics and Data Sciences 384 (Topic 2). The general theory of mathematical statistics. Includes distributions of functions of random variables, properties of a random sample, principles of data reduction, an overview of hierarchical models, decision theory, Bayesian statistics, and theoretical results relevant to point estimation, interval estimation, and hypothesis testing. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 384R, Computational Science, Engineering, and Mathematics 384R, Mathematics 384C, Statistics and Data Sciences (Topic 2), Statistics and Scientific Computation 384 (Topic 2). Prerequisite: Graduate standing; and Mathematics 362K and 378K, Statistics and Scientific Computation 382, or consent of instructor.

**CSE 384S. Mathematical Statistics II.**

Same as Mathematics 384D and Statistics and Data Sciences 384 (Topic 3). Continuation of Computational Science, Engineering, and Mathematics 384R and Mathematics 384C. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 384S, Computational Science,

Engineering, and Mathematics 384S, Mathematics 384D, Statistics and Data Sciences 384 (Topic 3), Statistics and Scientific Computation 384 (Topic 3: Mathematical Statistics II). Prerequisite: Graduate standing; Computational Science, Engineering, and Mathematics 384R (or Computational and Applied Mathematics 384R), Mathematics 384C, or Statistics and Scientific Computation 384 (Topic 2: Mathematical Statistics I); and Mathematics 362K and 378K, Statistics and Data Sciences 382 (or Statistics and Scientific Computation 382), or consent of instructor.

**CSE 384T. Regression Analysis.**

Same as Mathematics 384G and Statistics and Data Sciences 384 (Topic 4). Simple and multiple linear regression, inference in regression, prediction of new observations, diagnosis and remedial measures, transformations, and model building. Emphasis on both understanding the theory and applying theory to analyze data. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 384T, Computational Science, Engineering, and Mathematics 384T, Mathematics 384G, Statistics and Data Sciences 384 (Topic 4), Statistics and Scientific Computation 384 (Topic 4: Regression Analysis). Prerequisite: Graduate standing; and Mathematics 362K and 378K, Statistics and Data Sciences 382, (or Statistics and Scientific Computation 382), or consent of instructor.

**CSE 384U. Design and Analysis of Experiments.**

Same as Mathematics 384E and Statistics and Data Sciences 384 (Topic 6). Design and analysis of experiments, including one-way and two-way layouts; components of variance; factorial experiments; balanced incomplete block designs; crossed and nested classifications; fixed, random, and mixed models; and split plot designs. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 384U, Computational Science, Engineering, and Mathematics 384U, Mathematics 384E, Statistics and Data Sciences 384 (Topic 6), Statistics and Scientific Computation 384 (Topic 6: Design and Analysis of Experiments). Prerequisite: Graduate standing; and Mathematics 362K and 378K, Statistics and Data Sciences 382 (or Statistics and Scientific Computation 382), or consent of instructor.

**CSE 385M. Methods of Mathematical Physics I.**

Same as Physics 381M. Theory of analytic functions; linear algebra and vector spaces; orthogonal functions; ordinary differential equations; partial differential equations; Green's functions; complex variables. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 381M, Computational Science, Engineering, and Mathematics 385M, Physics 381M. Prerequisite: Graduate standing.

**CSE 385N. Methods of Mathematical Physics II.**

Same as Physics 381N. Continuation of Computational Science, Engineering, and Mathematics 385M and Physics 381M. Topology, functional analysis, approximation methods, group theory, differential manifolds. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 381N, Computational Science, Engineering, and Mathematics 385N, Physics 381N. Prerequisite: Graduate standing; and Computational Science, Engineering, and Mathematics 385M (or Computational and Applied Mathematics 381M) or Physics 381M.

**CSE 385R. Real Analysis.**

Same as Mathematics 381C. Measure and integration over abstract spaces; Lebesgue's theory of integration and differentiation on the real line. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 381R, Computational Science, Engineering, and Mathematics 385R,

Mathematics 381C. Prerequisite: Graduate standing and consent of instructor or the graduate adviser.

### **CSE 385S. Complex Analysis.**

Same as Mathematics 381D. Introduction to complex analysis. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 381D, Computational Science, Engineering, and Mathematics 385S, Mathematics 381D. Prerequisite: Graduate standing and consent of instructor or the graduate adviser.

### **CSE 386C. Methods of Applied Mathematics.**

Same as Mathematics 383C. Topics include basic normed linear space theory; fixed-point theorems and applications to differential and integral equations; Hilbert spaces and the spectral theorem; applications to Sturm-Liouville problems; approximation and computational methods such as the Galerkin, Rayleigh-Ritz, and Newton procedures. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 385C, Computational Science, Engineering, and Mathematics 386C, Mathematics 383C. Prerequisite: Graduate standing.

### **CSE 386D. Methods of Applied Mathematics.**

Same as Mathematics 383D. Topics include distributions, fundamental solutions of partial differential equations, the Schwartz space and tempered distributions, Fourier transform, Plancherel theorem, Green's functions, Sobolev spaces, weak solutions, differential calculus in normed spaces, implicit function theorems, applications to nonlinear equations, smooth variational problems, applications to classical mechanics, constrained variational problems. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 385D, Computational Science, Engineering, and Mathematics 386D, Mathematics 383D. Prerequisite: Graduate standing; and Computational Science, Engineering, and Mathematics 386C (or Computational and Applied Mathematics 385C) or Mathematics 383C.

### **CSE 386L. Mathematical Methods in Science and Engineering.**

Basic concepts in real and complex analysis, ordinary and partial differential equations, and other areas of applied mathematics with application to engineering and science. Three lecture hours a week for one semester. Computational and Applied Mathematics 386L and Computational Science, Engineering, and Mathematics 386L may not both be counted. Prerequisite: Graduate standing.

### **CSE 386M. Functional Analysis in Theoretical Mechanics.**

Same as Engineering Mechanics 386M. An introduction to modern concepts in functional analysis and linear operator theory, with emphasis on their application to problems in theoretical mechanics; topological and metric spaces, norm linear spaces, theory of linear operators on Hilbert spaces, applications to boundary value problems in elasticity and dynamical systems. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 386M, Computational Science, Engineering, and Mathematics 386M, Engineering Mechanics 386M. Prerequisite: Graduate standing, Engineering Mechanics 386L, and Mathematics 365C.

### **CSE 389C. Introduction to Mathematical Modeling in Science and Engineering I.**

First part of a two-part introduction to the elements of classical mechanics, physics, chemistry, and biology needed to begin work in computational engineering and sciences. Develops from first principles the classical mathematical theories underlying many of the models of physical phenomena important in modern applications. Three lecture hours a week for one semester. Only one of the following may be counted:

Computational and Applied Mathematics 389C, 397 (Topic: Introduction to Mathematical Modeling), Computational Science, Engineering, and Mathematics 389C. Prerequisite: Graduate standing.

### **CSE 389D. Introduction to Mathematical Modeling in Science and Engineering II.**

Second part of a two-part introduction to elements of classical mechanics, physics, chemistry, and biology needed to work in computational engineering and sciences. Develops from first principles the classical mathematical theories underlying many of the models of physical phenomena important in modern applications. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 389D, 397 (Topic: Introduction to Mathematical Modeling II), Computational Science, Engineering, and Mathematics 389D. Prerequisite: Graduate standing; and Computational Science, Engineering, and Mathematics 389C (or Computational and Applied Mathematics 389C) or the equivalent.

### **CSE 190, 390. Individual Research.**

Individual study or research in computational science, engineering, and mathematics arranged by mutual agreement between student and supervising faculty member. Individual instruction. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **CSE 390T. Training in the Teaching of Computational Science, Engineering, and Mathematics.**

The equivalent of three lecture hours a week for one semester, arranged by mutual agreement between student and faculty member. May be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **CSE 392. Topics in Computer Science.**

Advanced topics in the theory and application of computer science. Recent topics include geometric modeling and visualization, and high-performance and parallel computing. Three lecture hours a week for one semester. Computational and Applied Mathematics 395T and Computational Science, Engineering, and Mathematics 392 may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing.

### **CSE 393. Topics in Numerical Analysis.**

Advanced topics in the theory and application of numerical analysis. Recent topics include numerical methods for partial differential equations, computational problems in linear algebra, iterative methods and fast algorithms, numerical methods in functional approximation, and computational and variational methods for inverse problems. Three lecture hours a week for one semester. Computational and Applied Mathematics 393D and Computational Science, Engineering, and Mathematics 393 may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **CSE 393F. Finite Element Methods.**

Same as Aerospace Engineering 384P (Topic 4: Finite Element Methods) and Engineering Mechanics 394F. Derivation and implementation of the finite element method; basic coding techniques; application to problems of stress and diffusion. Three lecture hours a week for one semester. Only one of the following may be counted: Aerospace Engineering 384P (Topic 4), Computational and Applied Mathematics 394F, Computational Science, Engineering, and Mathematics 393F, Engineering Mechanics 394F. Prerequisite: Graduate standing and consent of instructor.

### **CSE 393H. Advanced Theory of Finite Element Methods.**

Contemporary topics in the theory and application of finite element methods. Three lecture hours a week for one semester. Computational and Applied Mathematics 394H and Computational Science, Engineering, and Mathematics 393H may not both be counted. Prerequisite: Graduate standing; Computational Science, Engineering, and Mathematics 393F (or Computational and Applied Mathematics 394F) or the equivalent; and Engineering Mechanics 386L or the equivalent.

### **CSE 393N. Numerical Methods for Flow and Transport Problems.**

Approximate solution methods for flow and transport problems in engineering and applied science. Finite element, finite difference, and residual methods for linear and nonlinear problems. Three lecture hours a week for one semester. Only one of the following may be counted: Computational and Applied Mathematics 393N, Computational Science, Engineering and Mathematics 393N, Mathematics 393N. Prerequisite: Graduate standing.

### **CSE 394. Topics in Probability and Statistics.**

Advanced topics in the theory and application of probability and statistics. Recent topics include nonparametric statistics and advanced probability. Three lecture hours a week for one semester. Computational and Applied Mathematics 394C and Computational Science, Engineering, and Mathematics 394 may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **CSE 396. Topics in Applied Mathematics.**

Advanced topics in the theory and application of applied mathematics. Recent topics have included partial differential equations, dynamical systems, kinetic theory, quantum mechanics, ergodic theory, statistical mechanics, Hamiltonian dynamics, nonlinear functional analysis, Euler and Navier-Stokes equations, microlocal calculus and spectral asymptotics, calculus of variations, and nonlinear partial differential equations. Three lecture hours a week for one semester. Computational and Applied Mathematics 393C and Computational Science, Engineering, and Mathematics 396 may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **CSE 397. Topics in Computational Science and Engineering.**

Advanced topics in the theory and application of computational science and engineering. Three lecture hours a week for one semester. Computational and Applied Mathematics 397 and Computational Science, Engineering, and Mathematics 397 may not both be counted unless the topics vary. May be repeated for credit when the topics vary. Prerequisite: Graduate standing and consent of instructor.

### **CSE 698. Thesis.**

The equivalent of three lecture hours a week for two semesters. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in computational science, engineering, and mathematics and consent of the graduate adviser; for 698B, Computational Science, Engineering, and Mathematics 698A.

### **CSE 398R. Master's Report.**

Preparation of a report to fulfill the requirement for the master's degree under the report option. Independent study. Offered on the credit/no credit basis only. Prerequisite: Graduate standing in computational science, engineering, and mathematics and consent of the graduate adviser.

### **CSE 399R, 699R, 999R. Dissertation.**

Independent study. Offered on the credit/no credit basis only. Prerequisite: Admission to candidacy for the doctoral degree.

### **CSE 399W, 699W, 999W. Dissertation.**

Independent study. Offered on the credit/no credit basis only. Prerequisite: Computational Science, Engineering, and Mathematics 399R, 699R, or 999R.

## **Graduate Studies**

Students enrolling in Graduate School courses associated with The University of Texas System's Archer Center must be admitted to the summer program in public policy at the Archer Center in Washington, DC. Coursework will take place at the Archer Center, 1901 Pennsylvania Ave., Washington, DC.

The program provides an opportunity to live and work in Washington, DC, and is a unique educational experience for graduate students interested in American government. The curriculum consists of an internship with a federal government-related agency or organization and coursework to complement the internship experience.

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## **Graduate School: GRS**

### **GRS 382. Inside View of the Federal Policymaking Process.**

Restricted to students participating in the Archer Center graduate program in public policy. On-the-ground and behind-the-scenes study of the federal policymaking process and the institutions and people that comprise the federal government. Sampling of literature on federal government dynamic and face-to-face interaction with individuals from the major institutions that participate in federal governance. Discussion and analysis of information gathered from meetings with officials from Congress, the White House, executive branch agencies, lobbying firms, nongovernmental organizations, think tanks, interest groups, and the media. The equivalent of three lecture hours a week for one semester. Taught in Washington, DC, during the summer session. Prerequisite: Graduate standing.

### **GRS 392, 692. Archer Center Washington Internship.**

Restricted to students participating in the Archer Center program in public policy. Internship with a federal government-related agency or organization in Washington, DC, facilitated through the Archer Center's program in public policy. Students select their internships and are supervised by a UT Austin faculty member. The equivalent of three lecture hours a week or six lecture hours a week for one semester. Taught in Washington, DC, during the summer session. Prerequisite: Graduate standing.

### **GRS 097. Teaching Assistant Fundamentals.**

Skills, behavior, and strategies for effective college teaching. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

## **Writing**

*Master of Fine Arts*

## For More Information

**Campus address:** J. Frank Dobie House (FDH), 702 East Dean Keeton Street, phone (512) 471-1601, fax (512) 471-9997; campus mail code: A3400

**Mailing address:** The University of Texas at Austin, MFA in Writing, James A. Michener Center for Writers, 702 East Dean Keeton Street Stop A3400, Austin TX 78705-3201

**E-mail:** mcw@www.utexas.edu

**URL:** <http://www.utexas.edu/academic/mcw/>

## Facilities for Graduate Work

The James A. Michener Center for Writers offers a cross-disciplinary Master of Fine Arts program that draws on strong programs in the New Writers Project (fiction and poetry), radio-television-film (screenwriting), and theatre (playwriting). The University Libraries, including the Fine Arts Library, provide rich resources for students interested in the creative process. The Harry Ransom Center houses a number of noted book collections as well as manuscripts, edited drafts, and early editions of creative works. The Jesse H. Jones Communication Center has extensive film and video production facilities, and the Performing Arts Center offers outstanding theatrical production facilities.

Students admitted to the program are offered James A. Michener Fellowships to support their study.

## Areas of Study

Students seeking the MFA are expected to develop professional skills in at least two of the following fields of creative work: fiction, poetry, screenwriting, and playwriting. The curriculum requires students to work across disciplines; for example, the student might study fiction as a primary field and screenwriting as a secondary field. Each candidate must write a thesis in his or her primary field.

## Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee in the spring semester 2015.

Michael W Adams	Kirk E Lynn
Charles E Berg	James L Magnuson
Oscar H Casares	Elizabeth McCracken
Steven Dietz	Cynthia Ann McCreery
Kurt O Heinzelman	Lisa Olstein
R Roland Hinojosasmith	Thomas G Schatz
Stuart D Kelban	Thomas B Whitbread
Peter N Lasalle	Dean H Young
Richard M Lewis	

## Degree Requirements

The student must complete at least fifty-four semester hours of coursework, including a three-hour first-year seminar; nine hours of creative work and six hours of studies courses in the primary field; six hours of creative work and three hours of studies courses in the secondary field; twenty-one hours of supporting coursework; and the six-hour thesis course. Reviews conducted each semester determine the student's eligibility to continue in the program. Further information about degree requirements is available from the graduate adviser.

## Graduate Courses

Courses offered by the Departments of English, Radio-Television-Film, and Theatre and Dance make up the core of the MFA degree program, supplemented by courses in writing offered by the Michener Center.

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

### Writing: WRT

#### WRT 380. First-Year Seminar.

Restricted to first-year candidates for the Master of Fine Arts in Writing. Three lecture hours a week for one semester. Offered on the letter-grade basis only. Prerequisite: Graduate standing in writing.

#### WRT 380S. Studies in Creative Writing.

Subjects include the study of literature, creative theory, and criticism in the genres of fiction, nonfiction, poetry, playwriting, and screenwriting. Three lecture hours a week for one semester. Prerequisite: Graduate standing in writing, or graduate standing and consent of the graduate adviser.

#### WRT 380W. Workshop in Creative Writing.

Subjects include writing fiction, writing poetry, playwriting, and screenwriting. Three lecture hours a week for one semester. Prerequisite: Graduate standing in writing, or graduate standing and consent of the graduate adviser.

#### WRT 182, 282, 382. Independent Projects.

Restricted to advanced MFA candidates. Conference work and independent study. May be repeated for credit. Prerequisite: Graduate standing in writing, or graduate standing and consent of the graduate adviser.

#### WRT 698. Thesis.

Individual instruction. Offered on the credit/no credit basis only. Prerequisite: For 698A, graduate standing in writing and consent of the graduate adviser; for 698B, Writing 698A.

## English as a Second Language

English as a second language (ESL) courses are offered as a requirement of the Office of Graduate Studies under the supervision of the Office of the Executive Vice President and Provost and the International Office. The courses are designed for international graduate students who have a below-passing score on certain assessment tests. The courses are graded on the credit/no credit basis only. In order to register for an ESL course, a student must also register for at least three semester hours of coursework at the University. These three hours must be taken on the letter-grade basis.

English as a second language courses may not be counted toward any degree, but are included in determining if a student's course load satisfies requirements for issues such as immigration, employment, housing, and financial aid.

More information is available from the International Office.

## Graduate Courses

The faculty has approval to offer the following courses in the academic years 2015–2016 and 2016–2017; however, not all courses are taught each semester or summer session. Students should consult the *Course Schedule* to determine which courses and topics will be offered during a particular semester or summer session. The *Course Schedule* may also reflect changes made to the course inventory after the publication of this catalog.

## **English as a Second Language: ESL**

### **ESL 388S. Oral Communication.**

Restricted to international students. Practicum in speaking skills. Focuses on pronunciation, fluency, grammatical accuracy, vocabulary development, formal presentations, and graduate-level discussions. Three lecture hours a week for one semester. With consent of instructor, may be repeated for credit. Offered on the credit/no credit basis only. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **ESL 388T. Basic Speaking Skills.**

Restricted to international students. Preparation for the International Teaching Assistant Oral English Proficiency Assessment. Practice focuses on the five tasks required in the assessment: summary, vocabulary list, reading, concept and graph explanations, and personal introduction. Three lecture hours a week for one semester. With consent of instructor, may be repeated for credit. Offered on the credit/no credit basis only. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **ESL 388W. Academic Writing.**

Restricted to international students. Practicum in writing skills. Focuses on basic syntax and sentence structure, paragraph and essay writing, and basic research writing. Three lecture hours a week for one semester. With consent of instructor, may be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **ESL 389S. Advanced Oral Communication.**

Restricted to international students. Focuses on accuracy and development of the speaking skills needed in academic contexts. Three lecture hours a week for one semester. With consent of instructor, may be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **ESL 389T. Communication and Teaching Culture.**

Restricted to international students. Focuses on pronunciation, presenting and summarizing information, and relevant topics in intercultural communication. Three lecture hours a week for one semester. With consent of instructor, may be repeated for credit. Offered on the credit/no credit basis only. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.

### **ESL 389W. Advanced Academic Writing.**

Restricted to international students. Focuses on the writing skills needed for qualifying exams, research, and conference papers. Three lecture hours a week for one semester. With consent of instructor, may be repeated for credit. Offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of instructor.



# Appendix

The University offers courses in the following fields of study. The abbreviations in the second column are used in catalogs, course schedules, and student records. Fields marked with a (\*) are offered only at the undergraduate level.

Course	Abbreviation
Accounting	ACC
* Actuarial foundations	ACF
Advertising	ADV
Aerospace engineering	ASE
African and African diaspora studies	AFR
* Air force science	AFS
American Sign Language	ASL
American studies	AMS
* Ancient history and classical civilization	AHC
Anthropology	ANT
* Applied learning and development	ALD
Arabic	ARA
Architectural engineering	ARE
Architectural interior design	ARI
Architecture	ARC
Art education	AED
Art history	AAS
Arts and entertainment technology	AET
* Asian American studies	AAS
Asian studies	ANS
Astronomy	AST
Bassoon	BSN
Bengali	BEN
Biochemistry	BCH
Biology	BIO
Biomedical engineering	BME
* Bridging disciplines	BDP
Business administration	BA
Business, government, and society	BGS
Chemical engineering	CHE
Chemistry	CH
Chinese	CHI
Civil engineering	C E
Clarinet	CLA
Classical civilization	C C
Cognitive science	CGS
Communication	COM
Communication sciences and disorders	CSD
Communication studies	CMS
Community and regional planning	CRP
Comparative literature	C L
Computational science, engineering, and mathematics	CSE
Computer science	C S

Conducting	CON
* Core texts and ideas	CTI
* Cultural studies	CLS
Curriculum and instruction	EDC
Czech	CZ
* Danish	DAN
Design	DES
* Developmental studies	DEV
Double bass	D B
Drum set	DRS
* Dutch	DCH
Economics	ECO
Educational administration	EDA
Educational psychology	EDP
Electrical engineering	EE
Energy and earth resources	EER
Engineering management	ENM
Engineering mechanics	E M
Engineering studies	E S
English	E
English as a second language	ESL
* Ensemble	ENS
* Environmental science	EVS
Euphonium	EUP
European studies	EUS
Finance	FIN
* First-year seminar	F S
Flute	FLU
Foreign language education	FLE
French	FR
* French civilization	F C
French horn	F H
* General engineering	G E
Geography	GRG
Geological sciences	GEO
German	GER
German, Scandinavian, and Dutch studies	GSD
* Germanic civilization	GRC
Government	GOV
Graduate school	GRS
Greek	GK
Guitar	GUI
Harp	HAR
* Harpsichord	HSC
Health and society	H S
Health education	HED
Hebrew	HEB
Hindi	HIN
History	HIS
Human development and family sciences	HDF
Human dimensions of organizations	HDO

Human ecology	H E	Organ	ORG
*Humanities	HMN	*Pashto	PSH
Iberian and Latin American languages and cultures	ILA	Percussion	PER
Information studies	INF	Persian	PRS
International business	I B	Petroleum and geosystems engineering	PGE
*International relations and global studies	IRG	Pharmacy	PHR
*Islamic studies	ISL	Pharmacy graduate studies	PGS
Italian	ITC	Philosophy	PHL
*Italian civilization	ITC	*Physical education	PED
Japanese	JPN	*Physical science	P S
Jewish studies	J S	Physics	PHY
Journalism	J	Piano	PIA
Kinesiology	KIN	Polish	POL
Korean	KOR	Portuguese	POR
Language teaching and coordination	LTC	*Portuguese civilization	PRC
Landscape architecture	LAR	Psychology	PSY
Latin	LAT	Public affairs	P A
Latin American studies	LAS	*Public health	PBH
Law	LAW	Public relations	P R
Legal environment of business	LEB	Radio-television-film	RTF
*Liberal arts	L A	Real estate	R E
*Liberal arts honors	LAH	*Recorder	REC
Linguistics	LIN	Religious studies	R S
Malayalam	MAL	Rhetoric and writing	RHE
Management	MAN	Risk management	R M
Management information systems	MIS	Russian	RUS
Manufacturing systems engineering	MFG	Russian, East European, and Eurasian studies	REE
Marine science	MNS	Sanskrit	SAN
Marketing	MKT	Saxophone	SAX
Materials science and engineering	MSE	*Scandinavian	SCA
Mathematics	M	*Science	SCI
Mechanical engineering	M E	Science and technology commercialization	STC
Medieval studies	MDV	Science-mathematics education	SME
Mexican American studies	MAS	Science, technology, and society	STS
Middle Eastern languages and cultures	MEL	Science, technology, engineering, and mathematics education	STM
Middle Eastern studies	MES	Serbian/Croatian	S C
*Military science	M S	Slavic	SLA
Molecular biology	MOL	Slavic and Eurasian languages	SEL
Music	MUS	*Social science	S S
*Natural sciences	NSC	Social work	S W
*Naval science	N S	Sociology	SOC
Neuroscience	NEU	Spanish	SPN
*Norwegian	NOR	*Spanish civilization	SPC
Nursing	N	Special education	SED
Nutrition	NTR	Statistics	STA
Oboe	OBO	Statistics and data sciences	SDS
Opera	OPR	Studio art	ART
Operations management	O M	*Swahili	SWA
Operations research and industrial engineering	ORI	*Swedish	SWE

*Systems and synthetic biology	SSB
Tamil	TAM
Telugu	TEL
Textiles and apparel	TXA
Theatre and dance	T D
Trombone	TRO
Trumpet	TRU
Tuba	TBA
Turkish	TUR
*Tutorial course	T C
*Undergraduate studies	UGS
*Urban studies	URB
Urdu	URD
*UTeach-liberal arts	UTL
UTeach-natural sciences	UTS
Vibraphone	VIB
*Vietnamese	VTN
Viola	VIA
Violin	VIO
Violoncello	V C
*Visual art studies	VAS
Voice	VOI
Women's and gender studies	WGS
Writing	WRT
*Yiddish	YID
Yoruba	YOR