

Electrical and Computer Engineering (BSECE/MSE)

Integrated Bachelor of Science in Electrical Engineering/Master of Science in Engineering Program

The integrated degree program results in simultaneously awarding a Bachelor of Science in Electrical and Computer Engineering: Integrated Option (BSECE) degree, and a Master's of Science in Engineering (MSE) degree in any one of the ten graduate tracks offered by the graduate program in electrical and computer engineering (ECE).

Information regarding the integrated program requirements and policies may be obtained from the ECE advising offices.

There are two stages to admission, an informal non-binding department based stage and a second stage in which the student formally applies to the Office of Graduate and Postdoctoral Studies within the integrated BSECE/MSE program and within one of the available ECE graduate tracks. At stage one, undergraduate students in the ECE department may apply to the integrated degree program after qualifying for admission to major sequence. The purpose of stage one is primarily to provide appropriate advising to students interested in and appropriate for the integrated program. Admission to the integrated program at stage one is based on the applicant's grade point average, letters of recommendation, a statement of purpose, and other relevant examples of academic ability and leadership. Students will be advised by the integrated program advisor about the appropriate courses to take and reserve for graduate credit in their senior year in order to complete the integrated program as efficiently as possible. As for admission to the regular standalone MSE program, all admissions decisions at stage two are made by the admissions committee in the respective graduate track, with admission requirements set by the graduate track, with the exception that Graduate Record Exam (GRE) test scores are not required of integrated program participants. While optimal, application and admission at stage one are not required for application and admission to the integrated program at stage two.

Total Hours Required: 150

Plan of Study

The Plan of Study is a suggested four-year course sequence to support academic planning and serves as a helpful guide. Currently enrolled students should meet with their academic advisor to tailor their course selections and timelines to their individual goals and circumstances.

Course	Title	Hours
Year 1		
Semester 1		
ECE 302	Introduction to Electrical Engineering	3
ECE 306	Introduction to Computing	3
RHE 306	Rhetoric and Writing	3
M 408C	Differential and Integral Calculus	4
First-Year Signature Course (090)		3
Hours		16
Semester 2		
ECE 319K	Introduction to Embedded Systems	3
M 408D	Sequences, Series, and Multivariable Calculus	4
PHY 303K	Engineering Physics I	3

PHY 105M	Laboratory For Physics 302K, 303K, and 317K	1
Visual and Performing Arts (050)		3
Hours		14
Year 2		
Semester 1		
ECE 411	Circuit Theory	4
M 427J	Differential Equations with Linear Algebra	4
PHY 303L	Engineering Physics II	3
PHY 105N	Laboratory For Physics 302L, 303L, and 317L	1
Social and Behavioral Sciences (080)		3
Hours		15
Semester 2		
ECE 312	Software Design and Implementation I	3
ECE 313	Linear Systems and Signals	3
M 340L	Matrices and Matrix Calculations	3
Humanities (040)		3
Free Elective		2
Hours		14
Year 3		
Semester 1		
ECE 333T	Engineering Communication	3
ECE 351K	Probability and Random Processes	3
Advanced technical Math component		4
Advanced technical component requirement		3
American and Texas Government (070)		3
Hours		16
Semester 2		
ECE 316	Digital Logic Design	3
Advanced technical component requirement		3
Advanced technical component elective		3
Advanced technical component laboratory		4
Free elective (mathematics or basic science)		4
Hours		17
Year 4		
Semester 1		
ECE 364D	Introduction to Engineering Design	3
Advanced technical component electives		6
U.S. History (060)		3
Free Elective		3
Graduate Coursework		3
Hours		18
Semester 2		
ECE 464C	Corporate Senior Design Project	4
U.S. History (060)		3
American and Texas Government (070)		3
Free Elective		3
Graduate Coursework		3
Hours		16
Year 5		
Semester 1		
Graduate Coursework		9
Hours		9
Semester 2		
Graduate Coursework		9
Hours		9
Semester 3		
Graduate Coursework		6
Hours		6
Total Hours		150

Requirements

All requirements are listed below, starting with the most specialized moving to the most general. Additional requirements may follow the table, so be sure to read the entire page. Some required courses listed

below may also satisfy [General Education](#) requirements, including [Core Curriculum](#).

Code	Title	Hours
Undergraduate		
Concentration		
One of the following concentrations:		21
Electrical and Computer Engineering, Computer Architecture and Embedded Systems		
Electrical and Computer Engineering, Communications, Signal Processing, Networks, and Systems		
Electrical and Computer Engineering, Data Science and Information Processing		
Electrical and Computer Engineering, Electronics and Integrated Circuits		
Electrical and Computer Engineering, Energy Systems and Renewable Energy		
Electrical and Computer Engineering, Fields, Waves, and Electromagnetic Systems		
Electrical and Computer Engineering, Nanoelectronics and Nanotechnology		
Electrical and Computer Engineering, Software Engineering and Design		
<i>Subtotal</i>		21
Degree (see details below)		61
Free electives: Additional coursework to reach total hours required.		14
<i>Subtotal</i>		75
General Education		
Remaining Core Curriculum (42 hours total)		24
Foreign Language other than English, Beginning Proficiency		
<i>Subtotal</i>		24
College Requirements - Engineering		
General University Requirements		
Graduate		30
Total Hours		150

Degree-Bachelor of Science in Electrical and Computer Engineering

Code	Title	Hours
<i>Electrical and Computer Engineering Courses</i>		
ECE 302	Introduction to Electrical Engineering (part II science and technology)	3
or ECE 302H	Introduction to Electrical Engineering: Honors	
ECE 306	Introduction to Computing	3
ECE 411	Circuit Theory	4
ECE 312	Software Design and Implementation I	3
or ECE 312H	Software Design and Implementation I: Honors	
ECE 313	Linear Systems and Signals	3
ECE 319K	Introduction to Embedded Systems	3
or ECE 319H	Introduction to Embedded Systems: Honors	
ECE 333T	Engineering Communication	3
ECE 351K	Probability and Random Processes	3
ECE 364D	Introduction to Engineering Design	3
or ECE 364E	Interdisciplinary Entrepreneurship	
Hours chosen from: senior design project		4
ECE 464G	Multidisciplinary Senior Design Project	
ECE 464H	Honors Senior Design Project	

ECE 464K	Senior Design Project	
ECE 464R	Research Senior Design Project	
ECE 464S	Start-Up Senior Design Project	
<i>Advanced Technical Elective: Within Any Core of Electrical Engineering</i>		
Within any core of Electrical Engineering, Hours chosen from:		3
One upper-division electrical engineering course		
ECE 316	Digital Logic Design	
<i>Mathematics</i>		
Choose a sequence below:		8
Sequence 1:		
M 408C	Differential and Integral Calculus	
M 408D	Sequences, Series, and Multivariable Calculus	
Sequence 2:		
M 408K	Differential Calculus	
M 408L	Integral Calculus	
M 408M	Multivariable Calculus	
M 427J	Differential Equations with Linear Algebra	4
M 340L	Matrices and Matrix Calculations	3
<i>Physics</i>		
PHY 303K	Engineering Physics I	3
PHY 105M	Laboratory For Physics 302K, 303K, and 317K	1
PHY 303L	Engineering Physics II	3
PHY 105N	Laboratory For Physics 302L, 303L, and 317L	1
<i>Rhetoric and Writing</i>		
RHE 306	Rhetoric and Writing	3
Total Hours		61

Additional Requirements and Policies

Enrollment in ECE 333T, ECE 160, ECE 260, ECE 360, ECE 460, and ECE 379K requires completion of ECE 312 or ECE 313 with a grade of at least C-.

Pre-approved courses are used to fulfill technical core, advanced math and/or science and core technical electives; other elective courses must be approved by the electrical and computer engineering faculty before the student enrolls in them.

Transfer Coursework: No more than 25 semester credit hours of transfer electrical and computer engineering coursework may be counted for credit toward the electrical and computer engineering degree.

Free Electives Policy

Must include at least one advanced mathematics or basic science course (three hours); no more than three hours of lower-division coursework; all coursework must count for a major in the offering department; all coursework must be taken in residence, except that up to three credit hours can be transferred with approval; no course can duplicate a course the student has taken or is required to take as part of the other Electrical and Computer Engineering coursework requirements.

Upper-Division Technical Component Areas

Electrical and computer engineering students must choose an advanced technical component area from the electrical engineering or computer engineering concentrations. Concentrations give students the flexibility to tailor their upper-division academic program to meet a variety of career goals, while ensuring that they graduate with a robust grounding in one or more selected technical or specialty areas.

For all concentrations, the student must complete all courses in the area on the letter-grade basis. Detailed guidelines for choosing areas

and elective courses within each area are published on the electrical and computer engineering department website. Approved electives for each area may be subject to periodic change as needs arise.

Electrical Engineering Option

Advanced Technical Component (mathematics) is four hours and one Advanced Technical Component Requirement is three hours.

Computer Engineering Option

Advanced Technical Component (mathematics) is three hours and one Advanced Technical Component Elective is four hours.

Alternate Mathematics Courses

For students who choose an advanced technical component area in computer engineering:

Code	Title	Hours
M 427L	Advanced Calculus for Applications II	4
M 328K	Introduction to Number Theory	3
M 343K	Introduction to Algebraic Structures	3
M 344K	Intermediate Symbolic Logic	3
M 348	Scientific Computation in Numerical Analysis	3
M 358K	Applied Statistics	3
M 374M	Mathematical Modeling in Science and Engineering	3
C S 341	Automata Theory	3
C S 346	Cryptography	3

For students who choose an advanced technical component area in electrical engineering:

Code	Title	Hours
M 325K	Discrete Mathematics	3
M 328K	Introduction to Number Theory	3
M 346	Applied Linear Algebra	3
M 348	Scientific Computation in Numerical Analysis	3
M 358K	Applied Statistics	3
M 361	Theory of Functions of a Complex Variable	3
M 362M	Introduction to Stochastic Processes	3
M 372K	Partial Differential Equations and Applications	3
M 374	Fourier and Laplace Transforms	3
M 374M	Mathematical Modeling in Science and Engineering	3

Additional Requirements and Policies

The integrated program requires 120 semester credit hours (SCH) for the BSECE portion of the integrated program, as opposed to the 125 SCH minimum required for the BSECE degree alone. Students in the integrated program begin taking graduate courses as seniors. Students admitted to the integrated program will normally take and reserve for graduate credit two graduate courses in place of approved electives from the advanced technical coursework that would *otherwise* be required in the regular/standalone BSECE program. However, precisely which BSECE electives are to be replaced by the graduate courses can be adjusted as approved by technical core faculty advisors.

Students in this program will receive the BSECE and MSE degrees simultaneously after successfully completing a minimum total of 150 semester credit hours, 30 of which must qualify for the MSE program of work in electrical and computer engineering. Students unable to successfully complete the integrated program may obtain a BSECE

degree by satisfying all of the requirements for the standalone BSECE degree. Since the regular BSECE degree requirements are a subset of the Integrated BSECE/MSE Program degree requirements, an undergraduate student should still be on a trajectory to graduate with the regular BSECE degree in the same timeframe that the student was on when applying to the Integrated BSECE/MSE Program. A student dismissed from the integrated program while a graduate student should already meet the degree requirements for the regular BSECE degree.