

Chemistry (CH)

CH 301, 401 Principles of Chemistry I 3-4 Hours

CH 301C, 401C Foundations of Chemistry I 3-4 Hours

An introduction to chemistry for chemistry majors. Includes gases, atomic theory, bonding, and thermodynamics.

CH 301N Chemistry in Our World I 3 Hours

Designed for non-science and Textiles and Apparel majors. Examine the nature of matter, energy, chemical reactions, and chemical thermodynamics. Discuss how these fundamentals of chemistry relate to real-world applications. Not intended as preparation for Chemistry 301.

CH 302, 402 Principles of Chemistry II 3-4 Hours

Development and application of concepts, theories, and laws underlying chemistry.

CH 302C, 402C Foundations of Chemistry II 3-4 Hours

An introduction to chemistry for chemistry majors. Includes equilibria, kinetics, nuclear chemistry, inorganic chemistry, and electrochemistry.

CH 302N Chemistry in Our World II 3 Hours

Designed for non-science and Textiles and Apparel majors. Survey organic chemistry including the nature of chemical bonding, molecular structure, nomenclature, and reaction types. Examine polymers and nutrition. Discuss how these fundamentals of chemistry relate to real-world applications.

CH 204 Introduction to Chemical Practice 2 Hours

Introduction to the techniques of modern experimental chemistry. Designed to provide basic laboratory and analytical skills. May include organic, analytical, and physical chemistry, as well as materials science.

CH 104M Introduction to Chemical Practice I 1 Hour

Introduction to the techniques of modern experimental chemistry. Designed to provide basic laboratory and analytical skills. May include organic, analytical, and physical chemistry, as well as materials science.

CH 104N Introduction to Chemical Practice II 1 Hour

Introduction to the techniques of modern experimental chemistry. Designed to provide basic laboratory and analytical skills. May include organic, analytical, and physical chemistry, as well as materials science.

CH 206K Undergraduate Research 2 Hours

Introduction to research practices; supervised individual undergraduate research in chemistry.

CH 107, 207 Topics in Conference Course 1-2 Hours

Supervised study in chemistry.

CH 207K Introduction to Science Outreach in Elementary Schools 2 Hours

Developing and presenting level-appropriate science laboratories to students in local elementary schools. A hands-on, discovery learning approach to science is emphasized.

CH 207L Peer Teaching 2 Hours

Students act as peer teaching assistants in other University chemistry courses, mainly large general chemistry lecture sections.

CH 108, 208, 308, 408 Topics in Chemistry 1-4 Hours

CH 110K Organic Chemistry Laboratory 1 Hour

Primarily for premedical, pre dental, life sciences, and pharmacy majors.

CH 110L Organic Chemistry Laboratory 1 Hour

Primarily for premedical, pre dental, life sciences, and pharmacy majors.

CH 317 Descriptive Inorganic Chemistry 3 Hours

Synthesis and properties of inorganic, bioinorganic, and organometallic compounds.

CH 119C Professional Development for Chemists 1 Hour

Explore professional development in chemistry, excellence in research, scientific communication, ethics, and career planning.

CH 119S, 219S, 319S, 419S, 519S, 619S, 719S, 819S, 919S Topics in Chemistry 1-9 Hours

This course is used to record credit the student earns while enrolled at another institution in a program administered by the University's Study Abroad Office. Credit is recorded as assigned by the study abroad adviser in the Department of Chemistry. University credit is awarded for work in an exchange program; it may be counted as coursework taken in residence. Transfer credit is awarded for work in an affiliated studies program.

CH 220C Organic Chemistry Laboratory 2 Hours

CH 120K Health Professions Organic Chemistry Laboratory 1 Hour

CH 320M Organic Chemistry I 3 Hours

Primarily for premedical, pre dental, life sciences, and pharmacy majors. Development of organic chemical structure, nomenclature, and reactivity.

CH 320N Organic Chemistry II 3 Hours

Primarily for premedical, pre dental, life sciences, and pharmacy majors. The development of organic chemical functional group reactivity, reaction mechanisms, with analogous aqueous transformations in biochemical settings.

CH 328C Structure and Reactivity of Organic Molecules I 3 Hours

Explore the development of organic chemical structure, nomenclature, and reactivity.

CH 128K Organic Chemistry Laboratory 1 Hour

CH 128L Organic Chemistry Laboratory 1 Hour

CH 328M Organic Chemistry I 3 Hours

Primarily for chemistry and chemical engineering majors. The development of organic chemical structure, nomenclature, and reactivity.

CH 328N Organic Chemistry II 3 Hours

Primarily for chemistry and chemical engineering majors. The development of organic chemical reactivity, with an emphasis on synthesis and polymers.

CH 329C Structure and Reactivity of Organic Molecules II 3 Hours

Explore the development of organic chemical reactivity, with an emphasis on synthesis and polymers.

CH 129S, 229S, 329S, 429S, 529S, 629S, 729S, 829S, 929S Topics in Chemistry 1-9 Hours

This course is used to record credit the student earns while enrolled at another institution in a program administered by the University's Study Abroad Office. Credit is recorded as assigned by the study abroad adviser in the Department of Chemistry. University credit is awarded for work in an exchange program; it may be counted as coursework taken in residence. Transfer credit is awarded for work in an affiliated studies program.

CH 431 Inorganic Chemistry 4 Hours

Survey of the chemistry of the elements, incorporating both descriptive and theoretical aspects. Open-ended experiments designed to illustrate a variety of synthetic techniques.

CH 341 Special Topics in Laboratory Chemistry 3 Hours

Examples of topics are physical measurements techniques; electronics for scientists; advanced synthetic chemistry (organic or inorganic); separation techniques.

CH 644 Chemical Education: Secondary School 6 Hours

Issues and techniques in secondary school teaching of chemical sciences.

CH 144K Chemical Education Laboratory I 1 Hour
Development of classroom demonstrations, laboratory experiments, and teaching aids for secondary school teaching of the chemical sciences.

CH 144L Chemical Education Laboratory II 1 Hour
Development of classroom demonstrations, laboratory experiments, and teaching aids for secondary school teaching of the chemical sciences.

CH 353 Physical Chemistry I 3 Hours
Equations of state, laws of thermodynamics, ideal and nonideal solutions, phase equilibria, thermodynamics of chemical reactions.

CH 153K Physical Chemistry Laboratory 1 Hour

CH 353M Physical Chemistry I for Life Sciences 3 Hours
Thermochemistry and kinetics of reactions in cells, enzyme catalysis, electrical and transport properties of membranes.

CH 354 Quantum Chemistry and Spectroscopy 3 Hours
Fundamental principles of quantum mechanics, exactly soluble model problems, electronic structure of atoms and molecules, spectroscopy.

CH 354C Statistical Mechanics 3 Hours
An introduction to statistical mechanics.

CH 154K Physical Chemistry Laboratory 1 Hour

CH 354L Physical Chemistry II 3 Hours
Molecular energy levels, statistical thermodynamics (macroscopic thermodynamic functions from molecular input), and physical and chemical kinetics, with emphasis on the molecular viewpoint.

CH 354M Introduction to Computational Methods in Chemistry 3 Hours
Construction and implementation of numerical algorithms for solving differential equations which are common in chemistry. Subjects include chemical reaction rates, quantum mechanics, molecular dynamics, normal modes of vibration, and Monte Carlo methods.

CH 354P Advanced Chemistry: Molecular Biophysics 3 Hours
Examine organizing principles of biological systems on a molecular level using mathematical models rooted in physics and chemistry. Develop skills to create quantitative models of biophysical processes, scientific writing, presentation, and data analysis.

CH 354S Elements of Spectroscopy 3 Hours
Fundamentals of spectroscopy, with knowledge of elementary quantum mechanics. Separation of electronic, vibrational, rotational and spin quantum states; interaction of radiation and matter; theory and application of different types of spectroscopy including photoelectron, electronic absorption and emission, vibrational (infrared and Raman), rotational and magnetic resonance.

CH 455 Fundamentals of Analytical Chemistry 4 Hours
Chemical and instrumental methods in analytical chemistry.

CH 456 Analytical Chemistry 4 Hours

CH 365N Structures and Function of DNA Materials 3 Hours
Explore DNA's role in molecular and materials engineering, utilizing its predictable hybridization to build programmable structures.

CH 366C Advanced Inorganic Chemistry: Organometallics Catalysis 3 Hours
An in-depth and mostly chronological study of the evolution of organometallic and inorganic coordination chemistry, and its continued critical importance in a range of industrial processes. Covers a range of topical catalytic processes, paying particular attention to how chemical bonding and kinetics can be exploited to affect the relative rates of reaction.

CH 366D Bio-inorganic Chemistry and Spectroscopy 3 Hours
Covers the roles of transition metals in biology, mostly with respect to protein structure, function, and catalysis. Also covers methods of spectroscopy that are used to probe the geometrical and electronic structure of metal ions in proteins. Exposure to modern areas of study in bio-inorganic chemistry. Explores the principles of transition metal chemistry in the context of biological systems.

CH 366E Chemistry of the s-, p-, d-, and f-Block Elements 3 Hours
Focuses on the electronic structure of molecules and complexes, and how such information can predict important properties such as chemical reactivity, spectroscopy, and magnetism. Intended for upper-division chemistry majors with a basic understanding of concepts in inorganic chemistry.

CH 367C Materials Chemistry 3 Hours
Introduction to structural and physical properties of materials and synthetic strategies for making new materials in the nanoscale and mesoscale regimes, in addition to covering instrumental methods used to probe materials properties. Some aspects of applications (semiconductor devices, solar and fuel cells, smart and responsive materials) will be covered to illustrate the kinds of material properties that need to be considered in designing novel materials of specific function.

CH 367P Introduction to Polymer Science 3 Hours
Explore an overview of macromolecular soft materials including the fundamentals of polymer chemistry, physics, and engineering.

CH 368 Advanced Topics in Chemistry 3 Hours

CH 368.1 Research Methods: UTeach 3 Hours
Students use mathematics and science skills to solve research problems.

CH 368.2 Advanced Topic in Analytical Chemistry 3 Hours

CH 368.3 Advanced Topic in Inorganic Chemistry 3 Hours

CH 368.4 Advanced Topic in Organic Chemistry 3 Hours

CH 368.5 Advanced Topic in Physical Chemistry 3 Hours

CH 369K Techniques of Research 3 Hours
Advanced laboratory practice and introduction to research.

CH 371K Science Outreach in Elementary Schools 3 Hours
Students develop and present level-appropriate science laboratories to students in local elementary schools. Students also plan and create the infrastructure needed to administer the science program in concert with the science curriculum at a specific elementary school. A hands-on, discovery learning approach to science is emphasized.

CH 372S Study and Research Abroad: Austin International Framework 3 Hours
Designed specifically for students participating in the AIF program. Facilitates student-led mini-seminars and video conference call discussions. Explores student research and wider learning and cultural experiences in Austin and abroad.

CH 375C Physical Organic Chemistry 3 Hours
Explore reaction mechanisms and reactivity of organic chemicals and high-energy intermediates. Develop skills to design experiments and explain observed phenomena.

CH 375K, 475K Individual Study in Chemistry 3-4 Hours
Supervised reading or individual tutorial sessions on advanced topics in chemistry.

CH 375P Advanced Topics in Polymer Science 3 Hours

CH 375P.1 Advanced Polymer Synthesis 3 Hours
Explore a comprehensive overview of how to design and synthesize polymers found in everyday life. Discuss the everyday utility of synthetic polymers to put their significance into context.

CH 375P.2 Polymer Physical Chemistry 3 Hours

Examine the statistical, mechanical, and thermodynamic basis of polymer properties in melts, gels, and solutions. Explore the conformations and sizes of polymer molecules; the properties and structure of glassy, crystalline, and elastic (rubbery) polymers; the thermodynamics of polymer solutions, blends, and semi-crystalline materials; and the self-assembly of block polymers.

CH 375P.3 Advanced Polymer Engineering 3 Hours

Examine a multi-length scale (molecular, mesoscopic, and macroscopic) picture of mechanical and transport properties in polymeric materials, essential for rationally engineering polymers while addressing challenges in recycling, energy, healthcare, and sustainability.

CH 376K Advanced Analytical Chemistry 3 Hours

CH 378L Capstone Research and Thesis 3 Hours

Develop a capstone project with a faculty adviser, with a focus on advanced laboratory techniques and experimental design.

CH 379H Chemistry Honors Tutorial Course 3 Hours

Laboratory research project in a specific field of chemistry under the supervision of one or more faculty members.

CH 380L Inorganic Reactions and Structures 3 Hours

CH 380M Topics in Advanced Chemistry 3 Hours

CH 380N Advanced Inorganic Chemistry: Spectroscopy and Structure 3 Hours

Advanced inorganic chemistry, with emphasis on structure, spectroscopy, and ligand field theory.

CH 080R Dual MD/PhD Program with UT Medical Branch 0 Hours

Preclinical medical study at the University of Texas Medical Branch at Galveston.

CH 380T Current Concepts in Chemistry and Biochemistry: UTeach 3 Hours

Designed for beginning graduate students seeking a review of modern chemical concepts.

CH 381M Advanced Analytical Chemistry 3 Hours

Theory and application of special methods and recent advances.

CH 382J Survey of Physical Chemistry 3 Hours

Surface chemistry and catalysis, transport properties, macromolecules, electrochemistry and electrolyte solutions, molecular thermodynamics, solution kinetics, and photochemistry.

CH 382K Advanced Physical Chemistry: Introduction to Quantum Mechanics 3 Hours

CH 382L Advanced Physical Chemistry: Statistical Mechanics 3 Hours

CH 382M Advanced Physical Chemistry 3 Hours

Quantum chemistry.

CH 182T, 282T, 382T, 682T Advanced Study and Research: UTeach 1,2,3,6 Hours

Designed for beginning graduate students seeking review of modern chemical concepts.

CH 386J Advanced Organic Chemistry 3 Hours

Advanced organic chemistry, with emphasis on theory and reaction mechanisms.

CH 386K Advanced Organic Chemistry 3 Hours

Advanced organic chemistry, with emphasis on synthetic methods.

CH 387K Biochemical Techniques 3 Hours

Discussion of procedures and equipment used in modern biochemical investigation, with laboratory work to provide experience in techniques of general importance.

CH 190 Topics in Chemistry: Seminar 1 Hour

CH 190.1 Analytical-Physical Chemistry 1 Hour

CH 190.2 Organic Chemistry 1 Hour

CH 190.4 Inorganic Chemistry 1 Hour

CH 390K Advanced Topics in Inorganic Chemistry 3 Hours

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.

CH 390K.1 Advanced Inorganic Chemistry: Organometallics Catalysis 3 Hours

Explores the evolution of organometallic and inorganic coordination chemistry, and its importance in a range of industrial processes; and covers a range of topical catalytic processes.

CH 390K.2 Advanced Inorganic Chemistry: Bio-Inorganic Chemistry 3 Hours

Explores the roles of transition metals in biology, mostly with respect to protein structure, function and catalysis. Examines established and developing methods of spectroscopy used to probe the geometrical and electronic structure of metal ions in proteins. Analyzes modern areas of study in bio-inorganic chemistry, especially relating to the roles of metals in metalloenzymes, but also including emerging topics such as metallodrugs, metal-based imaging agents, and molecular sensors. The principles of transition metal chemistry will be explored, expanded and demonstrated in the context of biological systems.

CH 390L Advanced Topics in Analytical Chemistry 3 Hours

Topics include electrochemistry, electronics, mathematical methods, mass spectrometry, and optical methods.

CH 390L.1 Advanced Analytical Chemistry: Electrochemistry 3 Hours

Designed to introduce the fundamental principles of electrochemistry. An overview of the structure and properties of the electrode/solution interface is presented, and followed by a more detailed discussion of how thermodynamics, kinetics, and mass transfer affect electrochemical processes. Includes specific electrochemical methods, including potential step and sweep techniques, pulse voltammetry, impedance spectroscopy, and hydrodynamic methods. Focuses on specialized electrochemical phenomena, including: photoelectrochemistry, coupled electrochemical and homogeneous reactions, and bulk electrolysis. Introduces the use of digital simulations to solve electrochemical problems.

CH 390L.2 Advanced Analytical Chemistry: Mass Spectrometry 3 Hours

Overview of the instrumentation, methods, and theory of mass spectrometry and gas-phase ion chemistry. Subjects include ionization methods, mass analyzers, vacuum components and pressure measurement, ion activation methods, analytical figures of merit, and integration of mass spectrometry with separation methods. Other subjects include gas-phase thermochemistry, kinetic theory of ion fragmentation, interpretation of mass spectra, and special subjects that may include ion mobility, proteomics, imaging, and elemental analysis, among others.

CH 391 Advanced Topics in Organic Chemistry 3 Hours

Topics include organic photochemistry; molecular orbital theory; free radical chemistry; organometallic compounds; nuclear magnetic resonance and mass spectrometry; organic synthesis.

CH 391P Introduction to Polymer Science 3 Hours

Explore an overview of macromolecular soft materials including the fundamentals of polymer chemistry, physics, and engineering.

CH 392H Biomolecular Structure by Nuclear Magnetic Resonance Spectroscopy 3 Hours

Theory and application of modern nuclear magnetic resonance spectroscopy methods. Emphasis on applications to biological macromolecules, including protein and nucleic acid structure determination.

CH 392J Molecular Biology of the Yeast *Saccharomyces* 3 Hours

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.

CH 392N Physical Chemistry of Macromolecular Systems 3 Hours

Theory of macromolecular solutions and methods for characterization of macromolecular systems.

CH 392T Biotransformations of Drugs and Other Nonnutritive Compounds 3 Hours

Absorption and metabolism of naturally occurring and synthetic nonnutritive compounds.

CH 392U Comparative Biochemistry 3 Hours

Comparative aspects of protein structure, metabolism, respiration, and cellular regulation.

CH 192W Analytical Student Seminar 1 Hour

Student seminar presentations covering current research topics.

CH 393L Advanced Topics in Physical Chemistry 3 Hours

CH 393P Advanced Topics in Polymer Science 3 Hours

CH 393P.1 Advanced Polymer Synthesis 3 Hours

Explore a comprehensive overview of how to design and synthesize polymers found in everyday life. Discuss the everyday utility of synthetic polymers to put their significance into context.

CH 393P.2 Polymer Physical Chemistry 3 Hours

Examine the statistical, mechanical, and thermodynamic basis of polymer properties in melts, gels, and solutions. Explore the conformations and sizes of polymer molecules; the properties and structure of glassy, crystalline, and elastic (rubbery) polymers; the thermodynamics of polymer solutions, blends, and semi-crystalline materials; and the self-assembly of block polymers.

CH 393P.3 Advanced Polymer Engineering 3 Hours

Examine a multi-length scale (molecular, mesoscopic, and macroscopic) picture of mechanical and transport properties in polymeric materials, essential for rationally engineering polymers while addressing challenges in recycling, energy, healthcare, and sustainability.

CH 395F Genetics 3 Hours

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.

CH 395H Cell Biology 3 Hours

Detailed consideration of mechanisms of growth control, cell cycle regulation, mitosis, cell signaling, protein targeting, and the integration of these processes.

CH 395K, 695K Topics in Advanced Individual Study in Chemistry 3,6 Hours

Supervised reading or individual tutorial sessions on advanced topics in chemistry.

CH 197C, 297C, 397C, 597C, 697C, 997C Problems in Chemistry 1,2,3,5,6,9 Hours

CH 197P, 297P, 397P, 597P, 697P Problems in Chemistry 1,2,3,5,6 Hours

CH 397S Advanced Topics in Chemistry 3 Hours

CH 698 Thesis 6 Hours

CH 398T Professional Development for Graduate Students in Chemistry 3 Hours

Provides professional development skills to graduate students in chemistry. Subjects include excellence in teaching, scientific communication, grantsmanship, ethics, and career planning.

CH 399W, 699W, 999W Dissertation 3,6,9 Hours