

CHEMISTRY (CHEM)

CHEM 501 Advanced Physical Chemistry (3 Credits)

Fall; Kidwell. Quantum chemistry and molecular spectroscopy. Cross-listed with CHEM 401.

CHEM 502 Advanced Inorganic Chemistry (3 Credits)

Spring; Pike. Principles and applications of symmetry to structure, bonding, and spectroscopy. Cross-listed with CHEM 402.

CHEM 503 Advanced Organic Chemistry (3 Credits)

Fall; Walk. A structure-reactivity approach to reaction mechanism and synthesis. Cross-listed with CHEM 403.

CHEM 504 Advanced Analytical Chemistry (3 Credits)

Spring; Perrault. Advanced topics in analytical chemistry.

CHEM 508 Computational Chemistry (3 Credits)

Spring; Poutsma. Note: Not offered in Spring 2026. Principles and applications of computational methods for the determination of molecular structure and energy. Cross-listed with CHEM 408.

CHEM 515 Advanced Biochemistry (3 Credits)

Fall and Spring; Landino; Taylor. A continuation of the study of biological processes on a molecular level begun in CHEM 314 or BIOL 314. Membrane biochemistry, molecular immunology, protein structure and function, biochemical applications of genetic engineering, and other topics of current interest. Cross-listed with CHEM 415.

CHEM 519 Bioinorganic Chemistry (3 Credits)

Fall; Bebout. An intensive examination of current research approaches in the field of bioinorganic chemistry. Students will gain experience in reading and critically analyzing articles from the primary literature. Cross-listed with CHEM 419.

Prerequisite(s): BIOL 314 or CHEM 314 or BIOL 414 or CHEM 414

CHEM 556 Mass Spectrometry (3 Credits)

Spring; Poutsma. Principles and applications of modern mass spectrometric methods in chemistry. Topics include: instrumentation, spectral interpretation, gas-phase ion chemistry and spectroscopy, proteomics and metabolomics, forensic applications, and stable isotope chemistry.

CHEM 557 Organic Synthesis (3 Credits)

Fall; Speight. An advanced treatment of organic synthetic methods which includes examples of natural products preparations. Cross-listed with CHEM 457.

CHEM 558 Organic Spectroscopy (3 Credits)

Fall; Abelt. Theory and application of spectroscopic methods to the analysis of organic compounds. Topics include absorption, fluorescence, infrared, and proton and carbon nuclear magnetic resonance spectroscopies with an emphasis on structure elucidation and other practical applications. Cross-listed with CHEM 458.

CHEM 566 Directed Studies (3-4 Credits)

Fall and Spring; Staff. Graded Pass/Fail. No credits earned in this course may be applied to the number of credits required to satisfy graduate degree requirements. This course may be repeated for credit.

CHEM 623 Materials Sci of Surfaces (3 Credits)

Fundamental and applied aspects of metal, inorganic, polymer and other organic surfaces. Solid/solid, solid/liquid and solid/vapor interfaces. Their structure and defects, thermodynamics, reactivity, electronic and mechanical properties. Applications depend on class interests, but have previously included microelectronics, soils, catalysis, colloids, composites, environment sensitive mechanical behavior, UHV single crystal studies, materials durability, batteries and fuel cells, vacuum science and technology, and surface bioactivity. Consent of the Instructor required.

CHEM 650 Graduate Studies in Chemistry (2 Credits)

Fall and Spring; Scheerer/Speight. This course sequence, designed for the first year graduate student, acquaints them with the state of the art in chemical research with a focus on examination of the primary literature and training in oral presentations. Provides training in the responsible and ethical conduct of research, including discussions of fabrication, falsification, and plagiarism. Requires attendance at departmental colloquia.

CHEM 651 Graduate Studies in Chemistry II (1 Credit)

Fall and Spring; Scheerer/Speight. Continuation of CHEM 650.

Prerequisite(s): CHEM 650

CHEM 652 Topics: Physical Chemistry (1-3 Credits)

Fall and Spring; Staff.

CHEM 664 Topics: Biochemistry (1-3 Credits)

Fall and Spring; Staff.

CHEM 666 Directed Studies (1-12 Credits)

Fall and Spring; Staff. Graded Pass/Fail. No credits earned in this course may be applied to the number of credits required to satisfy graduate degree requirements. This course may be repeated.

CHEM 693 Intro to Graduate Research (3,6 Credits)

Fall/Spring; This course introduces students to graduate research. Students design and conduct research with a faculty advisor. / This course maybe repeated once, only for 3 semester credit hours, and only if no more than 3 semester credit hours have been earned already for 693.

CHEM 695 Dir Thesis Master's Research (1-12 Credits)

Fall and Spring; Staff. Note: Students who are not submitting a master's thesis may not use this course to satisfy degree requirements. Students design and conduct research in support of their master's thesis under the direction of a faculty member. This course may be repeated, but no more than 9 semester credit hours may be used to satisfy degree requirements for submitting a master's thesis.

CHEM 696 Summer Graduate Research (0 Credits)

Summer; Staff. Graded Pass/Fail. Permission of Instructor required. This course may be repeated.

CHEM 700 Thesis (1-12 Credits)

Fall and Spring; Staff. Graded: Grade of either G or U converts to P upon successful completion of a defense and submission and acceptance of the thesis. Note: Students who are not submitting a master's thesis may not use this course to satisfy degree requirements. Students finish the research for and the writing of their master's thesis under the direction of a faculty advisor. This course may be repeated, but no more than 6 semester credit hours may be used to satisfy degree requirements for a thesis master's (only).