

Chemistry (CHM) - Graduate Courses

Courses

CHM 412/512 Cr.3

Environmental Chemistry

This course examines the role of chemistry in shaping our environment, including atmospheric, aqueous, and terrestrial components. Students learn how fundamental chemical principles are applied to complex real systems in order to characterize environmental behavior and aid in prediction and decision making. Specific topics explored include climate change, ozone depletion, smog formation, water quality and treatment, energy policy, and the fate/transport of pollutants. Prerequisite: CHM 301. Offered Spring.

CHM 417/517 Cr.4

Biochemistry I: Macromolecules

A study of the structure and function of biological macromolecules with special emphasis on proteins. Topics include protein folding, protein-ligand interactions, protein function, and membrane structure and function. The laboratory focuses on contemporary biochemical techniques including quantitative biochemical assays, ligand binding, protein purification, and enzyme function. Lect 3, Lab 3. Prerequisite: "C" or higher in CHM 300 or CHM 304; BIO 315 or MIC 425 recommended. Students with credit in CHM 325 cannot earn credit in CHM 417/517. Offered Fall.

CHM 418/518 Cr.3

Biochemistry II: Metabolism and Genetic Information

This course provides a comprehensive and integrative approach to fundamental metabolism and the flow of genetic information. In particular, the course emphasizes the chemical principles governing metabolite inter-conversions, energy flow, regulation of metabolic pathways, and the maintenance of genetic information. Prerequisite: "C" or better in CHM 517. BIO 306 and BIO 315, or MIC 416 and MIC 425 recommended. Offered Spring.

CHM 419/519 Cr.3

Advanced Biochemistry Lab

A capstone biochemistry laboratory course that provides students with the opportunity to undertake hypothesis-driven research. Students will use a variety of contemporary biochemical and biophysical techniques to study biomolecular structure and function. As the capstone in the biochemistry major, students will give written and oral reports of their work that incorporate the primary literature. Lect. 1, Lab 6. Prerequisite: "C" or better in CHM 517; CHM 518 or concurrent enrollment. Offered Spring.

CHM 421/521 Cr.1-3

Advanced Topics in Chemistry

An advanced topic in chemistry based on appropriate prior work in physical chemistry, organic chemistry, inorganic chemistry, and analytical chemistry. Lecture and laboratory will be adapted to the topic being taught. May be repeated for credit when different topic is presented. Repeatable for credit - no maximum. Prerequisite: determined based on topic offered and include a minimum of three semesters of chemistry courses. Offered Occasionally.

CHM 422/522 Cr.3

Polymer Chemistry

A study of synthetic high molecular weight materials of practical application in industry or of theoretical interest in chemistry. Representative polymer systems are examined with respect to the effect of molecular weight, weight distribution, and structure on physical properties. The choice of monomeric starting materials and mechanisms of polymerization are examined in detail. Methods of characterizing macromolecules are surveyed. Lect. 2, Lab 2. Prerequisite: CHM 304; CHM 309 highly recommended. Offered Occasionally.

CHM 424/524 Cr.3

Spectroscopy

A survey of important spectroscopic methods used in chemistry: infrared and ultraviolet, proton and carbon-13 NMR, and mass spectrometry. Theory and practice of techniques are covered. Emphasis is placed on structure determination of organic molecules. Analysis of dynamic systems and mixtures may also be covered. Lect. 2, Lab. 3. Prerequisite: CHM 300 or CHM 304. Offered Spring - Even Numbered Years.

CHM 530 Cr.3

Chemistry in the Health Sciences

The application of chemical principles to the health sciences. Topics include, but are not limited to the chemistry of drugs, topical and inhalation anesthetics, and pH regulation. Prerequisite: admission to the Master of Science - Biology: Nurse Anesthesia Concentration Program. Offered Fall, Spring.

CHM 431/531 Cr.3

Advanced Inorganic Chemistry

An advanced course in inorganic chemistry building upon foundations presented in CHM 231, intended to highlight a more advanced theoretical treatment of inorganic compounds and reactions and applications of inorganic chemistry principles to catalysis, functional materials, and biological systems. Prerequisite: CHM 231; CHM 310 or concurrent enrollment. Offered Spring - Odd Numbered Years.

CHM 441/541 Cr.4

Instrumental Analysis

A study of the theory and principles of chemical instrumentation including the application of basic electronics, spectroscopy, separation science and electroanalytical methods of chemical analysis. Lect. 3, Lab. 3. Prerequisite: CHM 301. Offered Fall.

CHM 461/561 Cr.4

Nuclear Chemistry

A study of the decay of radioactive nuclides with emphasis on the theory of nuclear decay. Laboratory will include the study of the detection of radiation, methods of radio analysis and the safe handling of unsealed radioactive sources. Lect. 3, Lab. 3. Prerequisite: four semesters of chemistry courses. Students with credit in CHM 361 cannot earn credit in CHM 461/561. Offered Fall.

CHM 789 Cr.1-3

Directed Study

Independent study under the direction and supervision of a chemistry faculty member. Repeatable for credit - maximum six. Consent of instructor. Offered Fall, Winter, Spring, Summer.