



**CHEM 359** **ANALYTICAL CHEMISTRY I (4)** *Prerequisites: CHEM 104 and 106L.* Three hours lecture and three hours laboratory. This course focuses on the theory and practice of modern analytical chemistry including volumetric and electrochemical methods, sample collection, preparation, and sample validation. Laboratory work is designed to complement this study.

**CHEM 360** **ANALYTICAL CHEMISTRY II (5)** *Prerequisite: CHEM 359.* Three hours lecture and six hours laboratory. This course examines theoretical and experimental aspects of instrumental analysis with an emphasis on modern chromatographic, spectroscopic, and electrochemical methods.

**CHEM 399** **INTERNSHIP IN CHEMISTRY (1-6)** *Prerequisites: Juniors or seniors with a 2.25 minimum QPA; approval of written proposal by internship coordinator and supervising faculty prior to registration.* This internship is offered to provide practical experience in applications of chemical knowledge while under the supervision of a qualified professional. Internship opportunities are limited. Only three hours of this course may be applied toward the chemistry major. (See "Internships.")

**CHEM 410-411** **PHYSICAL CHEMISTRY I-II (3, 3)** *Prerequisites: CHEM 359, PHYS 161-162, MATH 211. Corequisite: CHEM 412L must accompany CHEM 411. Strongly recommended: MATH 301.* Three hours per semester. This course focuses on theoretical principles of chemistry that are used to explain and interpret observations made on states of matter: discussion of bulk properties in terms of thermodynamics, the use of spectroscopy to explore the behavior of individual atoms and molecules, and the analysis of the rates and mechanisms of chemical change.

**CHEM 412L** **PHYSICAL CHEMISTRY LABORATORY (2)** *Corequisite: CHEM 411 must accompany CHEM 412L.* Six hours laboratory. This course provides experimental investigation of the principles of physical chemistry and of the techniques of physicochemical measurement. Students keep a journal-style laboratory notebook and submit reports consistent with American Chemical Society style guidelines.

**CHEM 441** **CHEMISTRY SEMINAR (2)** *Prerequisite: Senior standing or consent of instructor.* Two hours lecture. This capstone course focuses on advanced scientific written and oral communication skills, scientific philosophy, research methodology, and scientific reasoning.

**CHEM 442** **CHEMICAL RESEARCH (3)** *Prerequisite: Chemistry major with senior standing or by special permission.* This course gives the chemistry major experience in initiating and executing an independent chemical investigation. The student's work is supervised by a faculty member. A satisfactory oral presentation of this lab-based research project at the Tri-College Consortium meeting is a required component of this course.