

Chemistry

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Major: Chemistry courses – 161; 185; 221; 222; 301; 325; 351; either 471 or 408-409; and two electives from the following: 311 or 312, 324, 341

Cognate courses – Mat 111/112 or Mat 121; Phy 161 and 185.

Comprehensive evaluation, with passing grade. Total of 9.25 major courses, plus 3 cognates = 12.25.

Students should work with their advisors to devise a course of study best suited to prepare them for graduate study or professional opportunities in their area of interest (e.g. environmental science, biochemistry). No more than 1 credit of any combination of 308 and 309 can count towards graduation.

Minor: Chemistry courses – 161; 185; 221; 222; 325; any one other, at the 300 level. Total of 6 minor courses.

By-pass credit opportunity: Students who are placed directly into 185 (Principles of Chemistry II), and who receive a grade of B or above therein, will receive credit for 161 or equivalent (Principles of Chemistry I) upon request.

Che 160. Special Topics. Open to first-year students only.

Che 161. Principles of Chemistry I. Presents current theory regarding the nature of matter from the nuclear scale to that of the molecule and a descriptive and theoretical introduction to the chemical reaction; organized around two central ideas: the atom and energy. Partially satisfies Natural World LADR.

Che 185. Principles of Chemistry II. A continuation of 161. Prerequisite: 161.

Che 221. Organic Chemistry I. Sources, structure, nomenclature and properties of organic and biomolecules. Prerequisite: 185.

Che 222. Organic Chemistry II. A continuation of the study of organic reactions with an emphasis on the determination of reaction mechanisms. Components of this course include spectroscopy and theoretical applications. Laboratory components include synthesis, instrumental analysis, and kinetics. Prerequisite: Che 221.

Che 260. Special Topics.

Che 301. Chemistry Seminar. Preparation for the Independent Study and information on postgraduate opportunities for chemistry majors. Specific topics include: I.S. guidelines, preparing and defending the I.S. proposal, literature searching, information on graduate schools, professional schools, the chemistry industry, and summer research opportunities. Must be completed during the junior year. 0.25 unit.

Che 307. Directed Study. 0.50 unit.

Che 308. Directed Research. Field or laboratory research performed under the direction of a professor. Prerequisite permission of directing professor. Graded Pass/Fail. 0.25 unit. This course does not count toward fulfillment of the requirements of the Chemistry major.

Che 309. Directed Research. Field or laboratory research performed under the direction of a professor. Prerequisite: permission of directing professor. Graded Pass/Fail. 0.50 unit. This course does not count toward fulfillment of the requirements of the Chemistry major.

Che 311. Physical Chemistry: Chemical Thermodynamics. An introduction to classical thermodynamics and its applications to phase relations, chemical reactivity, chemical equilibrium, and basic electrochemistry. Includes laboratory experience. Prerequisites: Che 185, Phy 185, Mat 122. Offered alternate years.

Che 312. Physical Chemistry: Quantum Chemistry. An introduction to wavemechanics and its applications to spectroscopy and molecular structure. Includes laboratory experience. Prerequisites: Che 185, Phy 185, Mat 122. Offered alternate years.

Che 322. Organic Chemistry III. Synthetic applications or organic reactions. Prerequisite: 222.

Che 324. Inorganic Chemistry. Principles of atomic and molecular structure and bonding in inorganic chemistry. Prerequisite: 325. Offered alternate years.

Che 325. Analytical Chemistry I. Chromatography and spectrophotometric methods of analysis, including GC, LC, HPLC, UV-VIS, IR, NMR. Prerequisite: 222.

Che 326. Analytical Chemistry II. Classical and electrochemical methods of analysis with inorganic applications; chemical equilibria. Field trips. Prerequisite: 222. Offered alternate years.

Che 341. Biochemistry I. Introduction to the application of fundamental chemical principles to the structure and function of proteins. Emphasis on protein structure, enzyme catalysis and kinetics, and special topics in protein chemistry. Laboratory work includes enzyme kinetics and protein purification. Includes student seminars. Prerequisites: Che 222 and Bio 185.

Che 342. Biochemistry II. Examination of energy metabolism and its regulation. Includes carbohydrate, fatty acid, lipid, nucleic acid, and amino acid metabolism. Laboratory work includes protein electrophoresis, peptide mapping, and the interaction of proteins with other biomolecules. Prerequisite: 341.

Che 351. Advanced Laboratory. A laboratory-intensive exploration of various techniques, which serve as vehicles to illustrate general aspects of inquiry in chemistry: experimental design, use of literature sources, treatment of experimental uncertainty, and use of laboratory notebooks. Team taught. Offered every Spring Term. Should be completed in the sophomore or junior year. Prerequisites: Che 222, Mat 111/112 or 121.

Che 357. Internship in Chemistry. Prerequisite: Permission of the instructor.

Che 360. Special Topics.

Che 370. Directed Study.

Che 408-409. Research. Prerequisite: Senior standing and consent of project advisor. May be offered in one term as the one-unit course 471. 0.50 unit each.

Che 465. Capstone Seminar. Course content will reflect the topic for the annual Capstone. Open to all juniors and seniors and may be repeated once for credit. Students may enroll in only one Capstone seminar in a given term.

Che 471. Senior Thesis. Prerequisite: senior standing and consent of project advisor. May be offered over two terms as the half-unit courses 408 and 409.

Che 499. Comprehensive Evaluation.