

COURSE DESCRIPTIONS

111. Introduction to Chemistry. Fall and Spring

3+2, Cr. 4. A one semester overview of general, organic, and biochemistry. Intended for non-science majors who elect chemistry to meet one of the natural science requirements. Students with a major or minor in elementary education, nursing, or physical education ordinarily take this course to meet their chemistry requirement. Not open to students with credit for CHEM 115, 121, or 131. Students make take CHEM 111 prior to taking CHEM 121, but may not use both courses toward a chemistry major or minor, or toward fulfillment of the General Education Requirements in Natural Science. Prerequisite: MATH 110 or placement higher than MATH 110 on the math placement examination.

115. Essentials of Chemistry. Fall

3+2, Cr. 4. A one semester introductory course in the principles of chemistry for engineering students. Not open to students with credit for CHEM 121 or 131. Prerequisite: Enrollment in the College of Engineering or consent of the Chair of the Chemistry Department.

116. Applications of Chemistry in Engineering. Spring

3+3, Cr. 4. A continuation of CHEM 115; offering additional principles of chemistry for engineering students, especially civil engineering students, with emphasis on analytical chemistry. Not open to students with credit for CHEM 122 or 132. Prerequisite: Chem 115 and enrollment in the College of Engineering, or consent of the Chair of the Chemistry Department.

121. General Chemistry I. Fall

3+3, Cr. 4. An introductory course in the principles of chemistry for science majors. The first of a two semester sequence. Required of majors and minors in chemistry and students in pre-medical, pre-dental, or medical technology programs, except for students who take CHEM 131. Not open to students with credit for CHEM 115 or 131 Prerequisite: Placement of CHEM 121 or CHEM 131 on the chemistry placement examination, or MATH 114 or placement higher than MATH 114 on the math placement examination.

122. General Chemistry II. Spring

3+3, Cr. 4. A continuation of CHEM 121 with an emphasis on descriptive inorganic chemistry. Not open to students with credit for CHEM 116 or 132. Prerequisite: CHEM 115, 121, or 131.

131. General Chemistry I - Honors. Fall

3+3, Cr. 4. Same lecture as CHEM 121, with a more challenging, in-depth laboratory program. Intended for students who are willing to intensify their learning. Recommended for chemistry majors. Not open to students with credit for CHEM 115 or 121. Prerequisite: Placement of CHEM 131 on the chemistry placement examination, or consent of instructor.

132. General Chemistry II - Honors. Spring

3+3, Cr. 4. A continuation of CHEM 131. Same lecture as CHEM 122, with a more challenging, in-depth laboratory program. Intended for students who are willing to intensify their learning. Recommended for chemistry majors. Not open to students with credit for CHEM 116 or 122. Prerequisite: CHEM 131 or consent of instructor.

190. Introduction to Chemical Research. Spring

7 weeks, Cr. 1. An introduction to chemical research methods and literature. A laboratory project is required. Prerequisite: CHEM 121 or 131. S/U grade.

221. Organic Chemistry I. Fall

3+3, Cr. 4. An introductory survey of the nomenclature, reactions, structures and properties of carbon compounds. Prerequisite: CHEM 116, 122 or 132.

222. Organic Chemistry II. Spring

3+3, Cr. 4. A continuation of CHEM 221. A further study of the reactions, structures and properties of carbon compounds, including reaction mechanisms and complex organic reactions. Prerequisite: CHEM 221.

230. Quantitative Analysis. Spring

3+4, Cr. 4. A study of the theory of chemical equilibria, electrochemistry and elementary chemical analysis. The laboratory work consists of an introduction to gravimetric, volumetric and instrumental methods of analysis. Prerequisite: CHEM 116, 122 or 132 or consent of Chair of the Department.

290. Perspectives on Chemistry

Cr. 1-4. Topics related to chemistry. May not be counted toward a major or minor in chemistry.

311. Elementary Physical Chemistry. Fall

3+3, Cr. 4. A one-semester course in physical chemistry covering elementary thermodynamics and kinetics, together with their applications to various chemical systems. Prerequisite: CHEM 221. Not open to students who have taken CHEM 321.

315. Biochemistry I. Fall

Cr. 3. Structure and function of proteins, carbohydrates and lipids with particular stress on physical biochemistry and enzyme kinetics. Overview of metabolism with an emphasis on integration and control. Prerequisite: CHEM 222.

316. Biochemistry II. Spring

Cr. 3. A continuation of CHEM 315 that is focused on the biosynthesis of nucleic acids and proteins and the regulation of these processes. Special topics in biochemistry. Prerequisite: CHEM 315.

317. Biochemistry Laboratory. Spring

0+3, Cr. 1. An introduction to the experimental methods used to characterize biomolecules and biochemical reaction. Prerequisite: CHEM 315 (may be taken concurrently).

321. Physical Chemistry I. Fall

4+3, Cr. 5. A theoretical study of chemistry involving thermodynamics, kinetics and modern structural concepts. Prerequisites: CHEM 221, MATH 152 or equivalent, PHYS 142. Recommended: CHEM 230.

322. Physical Chemistry II. Spring

4+3, Cr. 5. A continuation of CHEM 321. Prerequisite: CHEM 321.

332. Advanced Instrumental Analysis. Alternate Springs

2+4, Cr. 3. In depth study of theory and practice of nuclear magnetic resonance, spectroscopy, chromatography, and electrochemistry. Other topics include electronics (operational amplifiers) and computer interfacing. Prerequisite: CHEM 311 or 321.

381. Cooperative Education in Chemistry I.

Cr. 0.5-2. Experience in chemical research with a cooperating employer. Written report required. Prerequisites: CHEM 222 and approval of the Chair of the Department. S/U grade.

390. Topics in Chemistry.

Cr. 1-4. A study of various topics in chemistry. Prerequisite: dependent upon the topic.

421. Advanced Inorganic Chemistry. Fall

Cr. 3. A study of advanced topics in inorganic chemistry with emphasis on structure and bonding, transition metal chemistry, and organometallic chemistry. Prerequisite: CHEM 222 and (311 or 321) or consent of the Chair of the Department.

422. Inorganic Chemistry Laboratory. Spring

0+4, Cr. 1. Experiments involving structures and reactions of inorganic compounds. Prerequisite: CHEM 421 (may be taken concurrently).

440. Materials Chemistry. Alternate Falls

Cr. 3. An introduction to materials that fall into four broad classifications: electronic materials, polymers, ceramics, and metals, with an emphasis on synthetic and fabrication techniques. Prerequisite: CHEM 222 or consent of the instructor.

450. Advanced Organic Chemistry. Alternate Springs

Cr. 3. A study of physical organic chemistry and strategy in modern organic synthesis. Topics include linear free energy relationships, the Woodward-Hoffman rules and semiempirical quantum mechanical calculation techniques for organic molecules. Prerequisites: CHEM 222 and (311 or 321).

460. Quantum Mechanics.

Cr. 3. The fundamental concepts of quantum mechanics are examined. Topics include state functions and their interpretations, the Schroedinger equation, approximation methods, multielectron atoms and molecules. Prerequisite: CHEM 322 or consent of the instructor.

482-483. Cooperative Education in Chemistry II-III.

Cr. 0.5-2. Continuation of CHEM 381. Prerequisites: CHEM 381, satisfactory employer evaluation, and approval of the Chair of the Department. S/U grade. May be repeated beyond 483 for additional credit.

486. Internship in Chemistry.

Cr. 0.5-2. Students gain experience in chemistry by working at industrial or government laboratories. Written report required. S/U Grade. May be repeated for additional credit. Prerequisite: Consent of the Chair of the Department.

489. The Teaching of Natural Sciences.

Cr. 3. (See ED 489.) A study of the methods of teaching natural sciences in the secondary schools. Lectures, demonstrations and projects. This course may not

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be counted toward a major or minor in chemistry. A field component is required.
Prerequisite: admission to Teacher Education.

490. The Scientific Endeavor.

Cr. 3. An exploration of the scientific enterprise involving a study of foundational principals and assumptions of the scientific endeavor, its various methodologies, and its scope and limitations. This will include illustrations from historical case studies and "scientific revolutions". Students will also study the ethical and moral connections between their personal and professional science lives. Prerequisite: junior or senior standing. This course may not be used to fulfill the requirements of a science major.

493. Seminar in Chemistry. Fall and Spring

Cr. 0. All Chemistry majors are expected to register for this course. Report required in this forum for all those registered for CHEM 495. S/U grade.

494. Premedical Arts Colloquium. Fall and Spring

Cr. 0-1. (Also offered as BIO 494.) All Premedical Arts students are expected to register for this course every semester. May not be counted for a major or minor. Students who register for the colloquium for 1 credit must have the consent of the instructor. A maximum of 2 credit hours in this course may be counted toward graduation. S/U grade.

495. Special Problems in Chemistry. Fall and Spring

Cr. 0.5-2. A course in which each student attacks a chemical problem by study of the literature and by work in the laboratory. A written report is required. Must also report orally on research results in CHEM 493. May be repeated for additional credit. S/U grade. Prerequisite: consent of Chair of the Department.

497. Honors Work in Chemistry. Fall

Cr. 3. See Honors Work, page 48.

498. Honors Candidacy in Chemistry. Spring

Cr. 3. See Honors Work, page 48.