

CHEMISTRY (CHEM)

CHEM 1122. Chemical Principles and Applications. (4 Credits)

Brief but comprehensive survey of important chemical theories and applications of chemistry. Preparation for one-semester courses in organic chemistry and biochemistry. Atomic structures, chemical bonding, chemical reactions, stoichiometry, states of matter, and theories of solutions. Does not fulfill the two-semester general chemistry requirement for majors in biology, chemistry, pharmacy, physics or agriculture, health and natural resources. Does not satisfy the admission requirements of medical and dental schools.

Enrollment Requirements: Not open to students who have passed CHEM 1124. May not be taken out of sequence after passing CHEM 1127Q or 1137Q or 1147Q.

Content Areas: CA3LAB: Science & Tech Lab

Topics of Inquiry: TOI6L: Science Emp Inq (Lab)

CHEM 1124Q. Fundamentals of General Chemistry I. (4 Credits)

The first semester of a 3-semester sequence that is designed to provide a foundation for the principles of chemistry with special guidance provided for the quantitative aspects of the material. Topics include the physical and chemical properties of some elements, chemical stoichiometry, gases, atomic theory and covalent bonding.

Enrollment Requirements: Not open to students who have passed CHEM 1127Q, 1137Q, or 1147Q. Students who have passed CHEM 1122 will receive only two credits, but four credits will be used for calculating the GPA. Recommended preparation: MATH 1011Q or equivalent.

Skill Codes: COMP: Quantitative Competency

Content Areas: CA3LAB: Science & Tech Lab

Topics of Inquiry: TOI6L: Science Emp Inq (Lab)

CHEM 1125Q. Fundamentals of General Chemistry II. (3 Credits)

Follows CHEM 1124Q. Topics include the properties of aqueous solutions, thermochemistry, properties of gases and chemical equilibria.

Enrollment Requirements: CHEM 1124Q; open by consent of instructor for one credit to students who have passed CHEM 1127Q, 1137Q, or 1147Q. Not open to students who passed CHEM 1128Q, 1138Q, or 1148Q. Recommended preparation: Familiarity with fundamental algebraic principles.

Skill Codes: COMP: Quantitative Competency

Content Areas: CA3LAB: Science & Tech Lab

Topics of Inquiry: TOI6L: Science Emp Inq (Lab)

CHEM 1126Q. Fundamentals of General Chemistry III. (3 Credits)

Follows CHEM 1125Q. Topics include the properties of kinetics, complex ions, thermodynamics and electrochemistry.

Enrollment Requirements: CHEM 1125Q. Not open to students who have passed CHEM 1128Q, 1138Q, or 1148Q. Recommended preparation: Familiarity with fundamental algebraic principles.

Skill Codes: COMP: Quantitative Competency

Content Areas: CA3LAB: Science & Tech Lab

Topics of Inquiry: TOI6L: Science Emp Inq (Lab)

CHEM 1127Q. General Chemistry I. (4 Credits)

Designed to provide a foundation for more advanced courses in chemistry. Atomic theory, laws and theories concerning the physical and chemical behavior of gases, liquids, solids, and solutions. Quantitative measurements illustrating the laws of chemical combination in the laboratory component.

Enrollment Requirements: May not be taken out of sequence after passing CHEM 1124Q, 1137Q, 1147Q. Students who have passed CHEM 1122 will receive only 2 credits but 4 credits will be used for calculating the GPA. Repeat restrictions apply; see advising.uconn.edu/repeat-policy for more information.

Skill Codes: COMP: Quantitative Competency

Content Areas: CA3LAB: Science & Tech Lab

Topics of Inquiry: TOI6L: Science Emp Inq (Lab)

CHEM 1128Q. General Chemistry II. (4 Credits)

Equilibrium, thermodynamics, nuclear chemistry, and kinetics. Properties of some of the more familiar elements and their compounds. Equilibrium in solutions and reactions of the common cations and anions in the laboratory component.

Enrollment Requirements: CHEM 1127Q, 1137Q, or 1147Q. Not open to students who have passed CHEM 1126Q or 1138Q or 1148Q.

Skill Codes: COMP: Quantitative Competency

Content Areas: CA3LAB: Science & Tech Lab

Topics of Inquiry: TOI6L: Science Emp Inq (Lab)

CHEM 1137Q. Enhanced General Chemistry I. (4 Credits)

Designed to provide a foundation for more advanced courses in chemistry. Atomic theory, laws and theories concerning the physical and chemical behavior of gases, liquids, solids, and solutions. Quantitative measurements illustrating the laws of chemical combination in the laboratory component. Primarily for majors in chemistry and related disciplines; can be used as an alternate wherever CHEM 1127Q is listed as a prerequisite.

Enrollment Requirements: Not open for credit to students who have passed CHEM 1124Q or 1127Q or 1147Q. May not be taken out of sequence after passing CHEM 1138Q. Students who have passed CHEM 1122 will receive only two credits but four credits will be used for calculating the GPA.

Skill Codes: COMP: Quantitative Competency

Content Areas: CA3LAB: Science & Tech Lab

Topics of Inquiry: TOI6L: Science Emp Inq (Lab)

CHEM 1138Q. Enhanced General Chemistry II. (4 Credits)

Equilibrium, thermodynamics, nuclear chemistry and kinetics. Properties of some of the more familiar elements and their compounds. Equilibrium in solutions and reactions of the common cations and anions in the laboratory component. Can be used as an alternate wherever 1128Q is listed as a prerequisite.

Enrollment Requirements: CHEM 1127Q, 1137Q, or 1147Q. Not open to students who have passed CHEM 1126Q or 1128Q or 1148Q.

Skill Codes: COMP: Quantitative Competency

Content Areas: CA3LAB: Science & Tech Lab

Topics of Inquiry: TOI6L: Science Emp Inq (Lab)

CHEM 1147Q. Honors General Chemistry I. (4 Credits)

Designed to provide a foundation for more advanced courses in chemistry. Atomic theory, laws and theories concerning the physical and chemical behavior of gases, liquids, solids, and solutions. Quantitative measurements illustrating the laws of chemical combination in the laboratory component. Considerable personal initiative will be demanded of students in carrying out the laboratory assignments. Designed primarily for exceptionally well-prepared science and engineering students, although any qualified honors student may take it; can be used as an alternate wherever CHEM 1127Q is listed as a prerequisite.

Enrollment Requirements: Open to Honors students, others with consent. Not open for credit to students who have passed CHEM 1124Q or 1127Q or 1137Q. Students who have passed CHEM 1122 will receive only two credits but four credits will be used for calculating the GPA.

Grading Basis: Honors Credit

Skill Codes: COMP. Quantitative Competency

Content Areas: CA3LAB: Science & Tech Lab

Topics of Inquiry: TOI6L: Science Emp Inq (Lab)

CHEM 1148Q. Honors General Chemistry II. (4 Credits)

Equilibrium, thermodynamics, nuclear chemistry and kinetics. Properties of some of the more familiar elements and their compounds. Equilibrium in solutions and reactions of the common cations and anions in the laboratory component. Considerable personal initiative will be demanded of students in carrying out the laboratory assignments. Designed primarily for exceptionally well-prepared science and engineering students, although any qualified honors student may take it. Can be used as an alternate wherever 1128Q is listed as a prerequisite.

Enrollment Requirements: CHEM 1147Q; or consent of instructor; designed primarily for exceptionally well-prepared science and engineering students, although any qualified honors student may take it. Not open to students who have passed CHEM 1126Q or 1128Q or 1138Q.

Grading Basis: Honors Credit

Skill Codes: COMP. Quantitative Competency

Content Areas: CA3LAB: Science & Tech Lab

Topics of Inquiry: TOI6L: Science Emp Inq (Lab)

CHEM 1189. Introduction to Chemical Research. (1-3 Credits)

Internship in research laboratories.

Enrollment Requirements: CHEM 1127Q or 1137Q or 1147Q.

CHEM 1194. The Science of Chemistry. (1 Credit)

Readings, lectures, films and field trips exploring the field of chemistry and its scientific and social implications.

CHEM 1199. Independent Study. (1 Credit)

With a change of content this course may be repeated for credit. May be repeated for a total of 1 credits

CHEM 2241. Organic Chemistry. (3 Credits)

An abridged course in organic chemistry designed to provide a background for related fields in which a general rather than a detailed knowledge of the compounds of carbon is required.

Enrollment Requirements: CHEM 1122 or 1124Q or 1127Q or 1137Q or 1147Q. May not be taken out of sequence after passing CHEM 2443.

CHEM 2242. Organic Chemistry Laboratory. (1 Credit)

Enrollment Requirements: CHEM 2241, which may be taken concurrently. Not open for credit to students who have passed CHEM 2443.

CHEM 2443. Organic Chemistry. (3 Credits)

Structure and reactions of the simpler classes of the compounds of carbon.

Enrollment Requirements: CHEM 1128Q, 1138Q, 1148Q, or 1126Q (1126Q may be taken concurrently). Only two credits after passing CHEM 2241. May not be taken out of sequence after passing CHEM 2444, 2446, or 4370. Repeat restrictions apply; see advising.uconn.edu/repeat-policy for more information.

CHEM 2444. Organic Chemistry. (3 Credits)

A continuation of CHEM 2443.

Enrollment Requirements: CHEM 2443. May not be taken out of sequence after passing CHEM 4370. Repeat restrictions apply; see advising.uconn.edu/repeat-policy for information.

CHEM 2445. Organic Chemistry Laboratory. (3 Credits)

Enrollment Requirements: CHEM 2444, which may be taken concurrently. Students who have passed CHEM 2242 or 2446 will receive only 2 credits. May not be taken out of sequence after passing CHEM 3442 or 4370.

CHEM 2446. Organic Chemistry Laboratory. (1 Credit)

Introduction to techniques, manipulations, calculations and spectroscopy.

Enrollment Requirements: CHEM 2443; open only to Chemical Engineering or Biomedical Engineering majors or by consent of instructor. Not open to students who have passed CHEM 2445.

CHEM 3150. Wine Chemistry. (2 Credits)

Introduction to natural products chemistry with an interdisciplinary perspective. Students will explore how chemical structure and composition correlate with physical properties. Case studies analyzing specific varietals and the structure/property correlations that are drawn using both analytical instrumentation and tasting panels.

Enrollment Requirements: CHEM 2241 or CHEM 2443, which may be taken concurrently. Instructor consent required.

CHEM 3170W. Technical Communications. (3 Credits)

Covers various aspects of technical writing and oral presentation of technical reports. The student will be introduced to the broad spectrum of the chemical literature; various approaches to information retrieval, including computer searches, will be demonstrated. Short reports based on chemical literature will include references and bibliographies. A major paper on a technical topic will be evaluated and corrected at each stage of its development. An oral report based on this material will also be required.

Enrollment Requirements: CHEM 2443; ENGL 1007 or 1010 or 1011.

Skill Codes: COMP. Writing Competency

CHEM 3189. Undergraduate Research. (1-3 Credits)

Original investigation carried on by the student under the guidance of a staff member. The student is required to submit a brief report at the end of each semester.

May be repeated for credit

CHEM 3193. Foreign Study. (1-6 Credits)

Consent of Department head required before student's departure. May count toward the major with consent of the Department Head. May be repeated for a total of 6 credits

CHEM 3194. Undergraduate Seminar. (1 Credit)

Discussions of topics relevant to further study and work in the field of chemistry. Students taking this course will be assigned a final grade of S (satisfactory) or U (Unsatisfactory).

Enrollment Requirements: Open only to Chemistry majors, others with consent of instructor.

May be repeated for a total of 2 credits

CHEM 3195. Special Topics. (1-6 Credits)

Enrollment Requirements: Prerequisites and recommended preparation vary.

May be repeated for credit

CHEM 3198. Variable Topics. (3 Credits)

Enrollment Requirements: Prerequisites and recommended preparation vary.

May be repeated for credit

CHEM 3199. Independent Study. (1-3 Credits)

May be repeated for credit

CHEM 3210. Descriptive Inorganic Chemistry. (3 Credits)

Introduction to bonding, structure, physical properties, and reactivity of the elements, as determined by their position in the periodic table.

Enrollment Requirements: CHEM 1126Q or 1128Q or 1138Q or 1148Q.

May not be taken out of sequence after passing CHEM 3214.

May be repeated for a total of 3 credits

CHEM 3214. Intermediate Inorganic Chemistry. (3 Credits)

A systematic presentation of bonding, structure, properties, and reactions of inorganic compounds.

Enrollment Requirements: CHEM 3210. Recommended preparation:

CHEM 3564.

CHEM 3215. Inorganic Chemistry Laboratory. (3 Credits)

The preparation, isolation, purification, and characterization of inorganic compounds; special techniques and instrumentation may be required.

Enrollment Requirements: CHEM 3214, which may be taken concurrently.

CHEM 3332. Quantitative Analytical Chemistry. (4 Credits)

Fundamentals of analytical chemistry. While it is a course for chemistry majors, it is also suitable for students in other technical fields who have an interest in learning quantitative analytical chemistry procedures applicable to analytical instrumentation. Traditional wet chemical techniques and instrumental methods. Quantitative chemistry and chemical computations.

Enrollment Requirements: CHEM 1126Q or 1128Q or 1138Q or 1148Q.

Recommended preparation: CHEM 3563. May not be taken out of sequence after passing CHEM 3334.

CHEM 3334. Instrumental Analysis I. (4 Credits)

Instrumental analytical techniques including molecular spectroscopy, atomic spectroscopy, electrochemistry, separations, and introductory electronics. This course is an extension of the instrumental portion of CHEM 3332.

Enrollment Requirements: CHEM 3332. Recommended preparation:

CHEM 3564.

CHEM 3563. Physical Chemistry I. (3 Credits)

A study of gases, liquids, solids, solutions, and thermodynamics.

Enrollment Requirements: CHEM 1126Q or 1128Q or 1138Q or 1148Q;

PHYS 1230 or 1402Q or 1502Q or 1602Q; MATH 2110Q or 2130Q.

CHEM 3564. Physical Chemistry II. (3 Credits)

A study of kinetics, atomic and molecular theory and spectroscopy.

Enrollment Requirements: CHEM 3563 or CHEG 3112; MATH 2410Q or 2420Q.

CHEM 3565W. Physical Chemistry Laboratory. (3 Credits)

Laboratory experiments in thermodynamics, kinetics and spectroscopy.

Enrollment Requirements: CHEM 3564, which may be taken concurrently; ENGL 1007 or 1010 or 1011.

Skill Codes: COMP Writing Competency

CHEM 3661. Polymeric Materials. (3 Credits)

Structure, properties and chemistry of high polymers. Methods of production and applications.

Enrollment Requirements: CHEM 2444. Not open to students who have passed CHEG 3156.

CHEM 4196W. Thesis for Undergraduate Chemistry Majors. (3 Credits)

A formal thesis is required, based on original investigation carried on by the student.

Enrollment Requirements: Minimum of 3 credits in CHEM 3189 or 3199; ENGL 1007 or 1010 or 1011; open only to Honors students.

Grading Basis: Honors Credit

Skill Codes: COMP Writing Competency

CHEM 4370. Environmental Chemistry - Atmosphere. (3 Credits)

Sources, transport, effects, fate, analytical chemistry, monitoring and management of chemical species; chemical principles, equilibria and reactions. The earth's atmosphere and atmospheric pollution; acid rain, global warming, ozone. Intended for senior chemistry majors choosing the environmental chemistry option, or as an elective, and for environmental science majors pursuing a concentration in environmental chemistry.

Enrollment Requirements: CHEM 2443, CHEM 2444, and CHEM 2445; or CHEM 2241, CHEM 2242; CHEM 3332 and 3563 both of which may be taken concurrently.

CHEM 4551. Introduction to Quantum Chemistry. (3 Credits)

An introduction to quantum theory and its applications to atomic and molecular structure and spectroscopy.

Enrollment Requirements: CHEM 3564.