

CHEMISTRY (CHEM)

CHEM C100 **3 Units (54 lecture hours)**
Principles of Chemistry
Grading Mode: Standard Letter, Pass/No Pass
Transfer Credit: CSU.

This course introduces students to basic concepts of chemistry and requires analyses of the socio-cultural contexts within which chemistry plays a central role. The course is designed to provide a general educational exposure to the physical sciences, specifically chemistry, and is not recommended for science majors. Graded or Pass/No Pass option.

CHEM C105 **2 Units (18 lecture hours; 54 lab hours)**
Chemistry Explorations for Teachers
Grading Mode: Standard Letter
Transfer Credit: CSU.

A class in basic scientific principles and methods related to chemistry. Emphasis is on developing a molecular level understanding of the world and applying the scientific method to understanding everyday phenomena. Course is designed to introduce future elementary and middle school teachers to the central ideas of chemistry through a series of laboratory experiments, hands-on exercises and discussions. Topics have been chosen to ensure coverage of the content in state and national science education standards. Online class requires purchase of a lab kit from the bookstore. Labs are completed at home on an independent study basis. Letter Grade only.

CHEM C110 **5 Units (72 lecture hours; 54 lab hours)**
Introduction to Chemistry
Advisory: MATH C010 with a grade of C or better.
Grading Mode: Standard Letter, Pass/No Pass
Transfer Credit: CSU; UC.

A lab science course in principles of inorganic, biochemistry, and organic chemistry for transfer and for associate degree programs in nursing, dietetics, paramedical, and other allied health fields. Not for students planning to take CHEM C130. Graded or Pass/No Pass option. UC Credit Limitations: no credit for CHEM C110 if taken after CHEM C180 or CHEM C220. UC Credit Limitations: CHEM C110, CHEM C130, CHEM C140 and PHYS C140 combined: maximum credit, 1 course.

CHEM C130 **4 Units (54 lecture hours; 54 lab hours)**
Preparation for General Chemistry
Advisory: MATH C030 with a grade of C or better.

Grading Mode: Standard Letter, Pass/No Pass
Transfer Credit: CSU; UC.

Introduction to both principles and calculations of chemistry and lab techniques, especially for those who continue with future chemistry courses. Graded or Pass/No Pass option. UC Credit Limitations: CHEM C110, CHEM C130, CHEM C140 and PHYS C140 combined: maximum credit, 1 course. UC Credit Limitations: no credit for CHEM C130 if taken after CHEM C180 or CHEM C220.

CHEM C140 **4 Units (54 lecture hours; 54 lab hours)**
Survey of Chemistry and Physics
Advisory: MATH C010 with a grade of C or better.

Grading Mode: Standard Letter
Transfer Credit: CSU; UC.

An investigation of basic principles of physics and chemistry including matter, physical and chemical properties, energy, motion, light, atomic structure, bonding, solutions and chemical reactions. The interdependence of chemistry and physics will be emphasized. This course is intended for non-science majors. This course is identical to PHYS C140. Letter Grade only. UC Credit Limitations: CHEM C110, CHEM C130, CHEM C140 and PHYS C140 combined: maximum credit, 1 course. UC Credit Limitations: no credit for CHEM C140, PHYS C140 if taken after CHEM C180 or CHEM C220. UC Credit Limitations: no credit for PHYS C110, PHYS C110L or PHYS C140, CHEM C140 if taken after PHYS C120 or PHYS C185. **C-ID:** PHYS 140.

CHEM C180 **4 Units (72 lecture hours)**
General Chemistry A
Prerequisite(s): CHEM C130 or a recent high school chemistry course with a grade of C or better, and MATH C030 or a recent high school course in intermediate algebra with a grade of C or better.

Co-requisite(s): CHEM C180L.

Grading Mode: Standard Letter
Transfer Credit: CSU; UC.

Introduction to both the principles and mathematical analysis of general chemistry and basic lab techniques, especially for students intending to proceed with further chemistry courses. Topics include atomic structure and bonding, the stoichiometry of chemical equations, thermochemistry, and the behavior of gases and solutions. Letter Grade only. UC Credit Limitations: no credit for CHEM C110 if taken after CHEM C180 or CHEM C220. UC Credit Limitations: no credit for CHEM C130 if taken after CHEM C180 or CHEM C220. UC Credit Limitations: no credit for CHEM C140, PHYS C140 if taken after CHEM C180 or CHEM C220. CHEM C180 and CHEM C180L equals CID: CHEM 110. CHEM C180, CHEM C180L, CHEM C185, and CHEM C185L equals CID: CHEM 120S.

CHEM C180L **1 Unit (72 lab hours)**
General Chemistry A Lab
Prerequisite(s): CHEM C130, or a recent high school chemistry course with a grade of C or better, and MATH C030, or a recent high school course in intermediate algebra with a grade of C or better.

Co-requisite(s): CHEM C180.

Grading Mode: Standard Letter
Transfer Credit: CSU; UC.

Introduction to both the principles and mathematical analysis of general chemistry lab techniques, especially for students intending to proceed with further chemistry courses. Topics include atomic structure and bonding, the stoichiometry of chemical equations, thermochemistry, and the behavior of gases and solutions. Letter Grade only. CHEM C180 and CHEM C180L equals CID: CHEM 110. CHEM C180, CHEM C180L, CHEM C185, and CHEM C185L equals CID: CHEM 120S.

CHEM C185 4 Units (72 lecture hours)**General Chemistry B****Prerequisite(s):** CHEM C180 and C180L with a grade of C or better.**Co-requisite(s):** CHEM C185L.**Grading Mode:** Standard Letter**Transfer Credit:** CSU; UC.

This course is the second semester of a two-semester sequence which continues the examination of the basic principles of inorganic chemistry with a special emphasis on reaction kinetics, chemical equilibrium, acid/base and solubility equilibria, enthalpy, entropy and Gibbs free energy, electrochemistry, coordination chemistry, and nuclear chemistry. Letter Grade only. CHEM C180, CHEM C180L, CHEM C185, and CHEM C185L equals CID: CHEM 120S.

CHEM C185L 1 Unit (72 lab hours)**General Chemistry B Lab****Prerequisite(s):** CHEM C180 and C180L with a grade of C or better.**Co-requisite(s):** CHEM C185.**Grading Mode:** Standard Letter**Transfer Credit:** CSU; UC.

This course is the second semester of a two-semester sequence (CHEM C180L and CHEM C185L) which continues the examination of the basic principles of inorganic chemistry with a special emphasis on reaction kinetics, chemical equilibrium, acid/base and solubility equilibria, enthalpy, entropy and Gibbs free energy, electrochemistry, coordination chemistry, and nuclear chemistry. Letter Grade only. CHEM C180, CHEM C180L, CHEM C185, and CHEM C185L equals CID: CHEM 120S.

CHEM C198 0.5 Units (4 lecture hours; 16 lab hours)**Lab Skills in Chemistry****Grading Mode:** Standard Letter, Pass/No Pass**Transfer Credit:** CSU.

This laboratory class teaches technical skills needed in understanding basic techniques and safety in chemistry. Skills learned include use of an analytical balance and pH meters, separation methods such as filtration and distillation, pipetting and titration techniques and spectroscopic analysis. Graded or Pass/No Pass option.

CHEM C220 3 Units (54 lecture hours)**Organic Chemistry A****Prerequisite(s):** CHEM C185 with grade C or better.**Grading Mode:** Standard Letter**Transfer Credit:** CSU; UC.

This course is the first semester of Organic Chemistry, a two-semester course, which includes topics on the properties and reactions of aliphatic and aromatic organic compounds. Emphasis is placed on the reaction mechanisms, fundamental principles, and modern instrumental methods. Letter Grade only. UC Credit Limitations: no credit for CHEM C110 if taken after CHEM C180 or CHEM C220. UC Credit Limitations: no credit for CHEM C130 if taken after CHEM C180 or CHEM C220. UC Credit Limitations: no credit for CHEM C140, PHYS C140 if taken after CHEM C180 or CHEM C220. CHEM C220, CHEM C220L, CHEM C225, and CHEM C225L equals CID CHEM 160S. CHEM C220 + CHEM C220L equals C-ID: CHEM 150.

CHEM C220L 2 Units (18 lecture hours; 90 lab hours)**Organic Chemistry A Lab****Prerequisite(s):** CHEM C185 with grade C or better.**Co-requisite(s):** CHEM C220.**Grading Mode:** Standard Letter**Transfer Credit:** CSU; UC.

Formerly CHEM C221. The laboratory component of Organic Chemistry A emphasizes basic organic chemistry theory and the techniques of separation, purification, synthesis, and analysis of organic compounds, including chromatography and instrumental methods, such as infrared and nuclear magnetic spectroscopy. Letter Grade only. CHEM C220 + CHEM C220L + CHEM C225 + CHEM C225L equals CID CHEM 160S. CHEM C220 + CHEM C220L equals C-ID: CHEM 150.

CHEM C225 3 Units (54 lecture hours)**Organic Chemistry B****Prerequisite(s):** CHEM C220 with grade C or better.**Co-requisite(s):** CHEM C225L.**Grading Mode:** Standard Letter**Transfer Credit:** CSU; UC.

Further study of the structures, reactions, and reaction mechanisms of organic compounds, with particular emphasis on conjugated molecules, aromatic systems, and carbonyl containing compounds and an introduction to biologically important molecules such as amino acids, carbohydrates, and lipids. Letter Grade only. CHEM C220 + CHEM C220L + CHEM C225 + CHEM C225L equals C-ID: CHEM 160S.

CHEM C225L 2 Units (18 lecture hours; 90 lab hours)**Organic Chemistry B Lab****Prerequisite(s):** CHEM C220L with a grade of C or better.**Co-requisite(s):** CHEM C225.**Grading Mode:** Standard Letter**Transfer Credit:** CSU; UC.

Formerly CHEM C226. Further study of the structures, reactions, and reaction mechanisms of organic compounds, with particular emphasis on conjugated molecules, aromatic systems, and carbonyl containing compounds and an introduction to biologically important molecules such as amino acids, carbohydrates, and lipids. Letter Grade only. CHEM C220 + CHEM C220L + CHEM C225 + CHEM C225L equals C-ID: CHEM 160S.

CHEM C281 4 Units (72 lecture hours)**Biochemistry****Prerequisite(s):** CHEM C220.**Advisory:** BIOL C180.**Grading Mode:** Standard Letter**Transfer Credit:** CSU; UC.

An introduction to the chemistry of biology. This course serves to satisfy transfer requirements for some biology and chemistry majors. This course is identical to BIOL C281. Letter Grade only.