

# CHEMISTRY

Chemists study the composition and transformations of matter. Chemists work in a wide variety of settings and find employment with government, academic, and private institutions. Chemistry is frequently described as the central science because of the connections between it and all other scientific disciplines. Earning a degree in chemistry can be the first step to careers with chemical, materials, or pharmaceutical companies, biotech firms, or forensic laboratories. It can also be a stepping stone on the route to a professional medical degree, such as medicine, physical therapy, or pharmacy. Chemists are readily employable after completing a bachelor's degree.

See the [Chemistry](#) page for program and contact information.

## Degrees

### Transfer

#### Associate of Arts Oregon Transfer

- [Chemistry - Associate of Arts Oregon Transfer \(AAOT\)](#)

## Courses

### CH 104 Introduction to Chemistry I (5 Credits)

**Prerequisites:** MTH 095 (or higher) or minimum placement Math Level 16. Introduces basic principles of general chemistry, including atomic theory, chemical formulas and equations, bonding, stoichiometry, acid/base chemistry, and solutions. Supporting laboratory work included. Not designed for science majors.

### CH 105 Introduction to Chemistry II (5 Credits)

**Prerequisites:** CH 104.

Builds on concepts from CH 104 introducing basic principles of general and organic chemistry, including bonding in carbon compounds, equilibrium, stereochemistry and functional group chemistry. Supporting laboratory work included. Not designed for science majors.

### CH 106 Introduction to Chemistry III (5 Credits)

**Prerequisites:** CH 105.

Builds on concepts from CH 105 introducing basic principles of general and biochemistry, including consideration of protein, carbohydrate and lipid structure and metabolism, bioenergetics, enzymes and nucleic acid chemistry.

### CH 107 Physical Science: Chemistry (4 Credits)

**Recommended preparation:** one year of high school algebra or equivalent or concurrent enrollment in MTH 060.

Provides an introduction to properties and structures of matter, chemical bonding, solutions, and chemical changes. Intended to provide the non-science major an introduction to the fundamental ideas, importance and impacts of chemistry in society.

### CH 199 Selected Topics: Chemistry (1-5 Credits)

Provides a learning experience in chemistry not currently available; this course is in development to be proposed as a permanent course.

### CH 221Z General Chemistry I (4 Credits)

**Prerequisites:** MTH 111Z or MTH 112Z, or MTH 251Z (or higher) or minimum placement Math Level 20.

**Corequisites:** CH 227Z.

Explores and applies principles and applications of chemistry. Emphasis on measurement, components of matter, atomic and molecular structure, quantitative relationships including foundational stoichiometry, and major classes of chemical reactions. CH 221Z is a lecture course; CH 227Z is the laboratory component.

### CH 222Z General Chemistry II (4 Credits)

**Prerequisites:** CH 221Z and CH 227Z.

**Corequisites:** CH 228Z.

Explores and applies principles presented in CH 221Z to the study of the solid, liquid, and gaseous states of matter. Principles of stoichiometry, thermochemistry, kinetics, and foundational equilibrium are explored and applied to the study of aqueous and gas-phase chemical reactions. CH 222Z is a lecture course; CH228Z is the laboratory component.

### CH 223Z General Chemistry III (4 Credits)

**Prerequisites:** CH 222Z and CH 228Z.

**Corequisites:** CH 229Z.

Builds upon the principles presented in CH 222Z, explores thermodynamics and chemical equilibrium, and applies them to the study of aqueous acid-base reactions, solubility, and electrochemistry. CH 223Z is a lecture course; CH 229Z is the laboratory component.

### CH 227Z General Chemistry I Laboratory (1 Credit)

**Prerequisites:** MTH 111Z or MTH 112Z, or MTH 251Z (or higher) or minimum placement Math Level 20.

**Corequisites:** CH 221Z.

Experiments correspond to the topics covered in CH 221Z including the fundamentals of chemical measurements, quantitative relationships in chemical analysis, and understanding atomic and molecular structure. CH 227Z is the laboratory component; CH 221Z is the lecture course.

### CH 228Z General Chemistry II Laboratory (1 Credit)

**Prerequisites:** CH 221Z and CH 227Z.

**Corequisites:** CH 222Z.

Experiments correspond to the topics covered in CH 222Z including the fundamentals of intermolecular interactions, stoichiometric relationships, chemical equilibria and their application to the synthesis, identification, and analysis of chemical compounds. CH 228Z is the laboratory component; CH 222Z is the lecture course.

### CH 229Z General Chemistry III Laboratory (1 Credit)

**Prerequisites:** CH 222Z and CH 228Z.

**Corequisites:** CH 223Z.

Experiments correspond to the topics covered in CH 223Z including the principles of chemical equilibria and their application to chemical analysis using volumetric and electrochemical methods. CH 229Z is the laboratory component; CH 223Z is the lecture course.

**CH 241 Organic Chemistry I (5 Credits)**

**Prerequisites:** CH 223Z and CH 229Z.

Builds on principles of general chemistry with an emphasis on the chemistry of carbon compounds for science and chemical engineering majors. Includes bond angles, molecular shape, Lewis structures, formal charge, electron orbitals, polar bonds, polar reactions, resonance, alkanes, alkenes, cycloalkanes, addition via carbocation, addition via cyclic intermediates, chirality, addition to alkynes, substitution, reaction mechanisms, and energy diagrams. The laboratory introduces standard lab techniques for separating, purifying and characterizing compounds on microscale and/or macroscale, while using record keeping methods acceptable in the discipline of chemistry.

**CH 242 Organic Chemistry II (5 Credits)**

**Prerequisites:** CH 241.

Introduces additional principles of organic chemistry for science and chemical engineering majors. Includes substitution reactions, elimination reactions, radical reactions, conjugation and molecular orbital theory, aromaticity, infrared spectroscopy, mass spectroscopy, nuclear magnetic resonance spectroscopy, and synthesis. The laboratory introduces derivatization reactions, the effect of solvents, and instrumental techniques while using record keeping techniques acceptable in the discipline of chemistry.

**CH 243 Organic Chemistry III (5 Credits)**

**Prerequisites:** CH 242.

Introduces additional principles of organic chemistry for chemistry, biology and chemical engineering majors. Includes electrophilic aromatic substitution, acidity and pKa of phenols, nucleophilic aromatic substitution, addition to a carbonyl, carboxylic acids and derivatives, enolate and enol nucleophiles, aldol and Claisen reactions and amines. The laboratory introduces synthetic methods and a synthesis project while using record keeping techniques acceptable in the discipline of chemistry.

**CH 298 Independent Study: Chemistry (1-6 Credits)**

**Prerequisites:** Instructor approval required.

**Recommended preparation:** Prior coursework in the discipline.

Individualized, advanced study in chemistry to focus on outcomes not addressed in existing courses or of special interest to a student. P/NP grading.

**CH 299 Selected Topics: Chemistry (1-5 Credits)**

Provides a learning experience in chemistry not currently available; this course is in development to be proposed as a permanent course.