

# CHEMISTRY (CHEM)

## CHEM 001A General Chemistry 5 Units

This course is the first semester of the one year college level general chemistry sequence. Students will study basic chemical principles: classification of matter, atomic structure and periodicity, chemical nomenclature, types of reactions, stoichiometry, thermochemistry, chemical bonds, physical states of matter and solution chemistry. This course is required for students majoring in physical and biological sciences and pre-professional majors, such as pre-medicine and dentistry. (C-ID CHEM 110 and CHEM 120S when combined with CHEM 001B)

Lecture Hours: 3 Lab Hours: 6 Repeatable: No Grading: L  
Prerequisite: CHEM 015 and MATH 013, both with C or better.  
Advisory Level: Read: 3 Write: 3 Math: None  
Transfer Status: CSU/UC Degree Applicable: AA/AS  
CSU GE: B1, B3 IGETC: 5A, 5C District GE: B1, B3

## CHEM 001AH Honors General Chemistry 5 Units

This course is the first semester of the one year college level general chemistry sequence. Students will study basic chemical principles: classification of matter, atomic structure and periodicity, chemical nomenclature, types of reactions, stoichiometry, thermochemistry, chemical bonds, physical states of matter and solution chemistry. This course is required for students majoring in physical and biological sciences and pre-professional majors, such as pre-medicine and dentistry. The Honors course will be enhanced in the following ways: (1) The lecture component of this course will require that students complete a set of selected readings pertinent to concepts covered in class, from peer reviewed journals, such as journals from the American Chemical Society (e.g. J. Chem. Ed.). Critical analysis of these readings is expected and the students will be evaluated with extra questions during the regular examinations of the course. (2) The lecture component of this course will require that students apply higher-order thinking in problem solving strategies. (3) The laboratory component of this course will require that students apply concepts covered in lecture to analytical methods. (4) The laboratory component of this course will require that students develop and test an experimental protocol to carry out an assigned experimental outcome. (C-ID CHEM 110 and CHEM 120S when combined with CHEM 001B)

Lecture Hours: 3 Lab Hours: 6 Repeatable: No Grading: L  
Prerequisite: CHEM 015 and MATH 013, both with C or better.  
Advisory Level: Read: 3 Write: 3 Math: None  
Transfer Status: CSU/UC Degree Applicable: AA/AS  
CSU GE: None IGETC: None District GE: None

## CHEM 001B General Chemistry 5 Units

Students will study topics including organic chemistry, thermodynamics, chemical kinetics, chemical equilibrium, electrochemistry, coordination compounds, and nuclear chemistry. The laboratory emphasizes qualitative and quantitative analysis of inorganic compounds and introduces electronic instrumentation. This course is a continuation of CHEM 001A, the second semester of a one year college level general chemistry sequence. (C-ID CHEM 120S when combined with CHEM 001A or CHEM 001AH)

Lecture Hours: 3 Lab Hours: 6 Repeatable: No Grading: L  
Prerequisite: CHEM 001A with C or better.  
Advisory Level: Read: 3 Write: 3 Math: None  
Transfer Status: CSU/UC Degree Applicable: AA/AS  
CSU GE: B1, B3 IGETC: 5A, 5C District GE: B1, B3

## CHEM 010 Everyday Chemistry 4 Units

Students will study how chemistry impacts their everyday life. This course includes topics that address socio-cultural aspects of chemistry such as consumer products, energy applications, food production and nutrition. Students will also examine the design, use, and life cycle of synthetic materials and their environmental impact. This course is geared for non-science majors or for students without previous background in science. (C-ID CHEM 100)

Lecture Hours: 3 Lab Hours: 3 Repeatable: No Grading: L  
Prerequisite: MATH 111 with P grade  
Advisory Level: Read: 3 Write: 3 Math: None  
Transfer Status: CSU/UC Degree Applicable: AA/AS  
CSU GE: B1, B3 IGETC: 5A, 5C District GE: B1, B3

## CHEM 012A Organic Chemistry 5 Units

This is the first semester of a year-long comprehensive organic chemistry course with emphasis on structure, reaction mechanisms, and kinetics. Students will study topics that include nomenclature, stereochemistry, mechanisms, reactions, and spectroscopic studies of organic compounds. They will use problem-solving techniques in order to elucidate mechanistic, structural, and stereochemical features of reactions and molecules, respectively. In lectures and laboratory students will implement methods that focus on synthesis, isolation, purification, elucidation, and identification of organic structures, instrumental methods, and data interpretation. (C-ID CHEM 160 when combined with CHEM 012B)

Lecture Hours: 3 Lab Hours: 6 Repeatable: No Grading: L  
Prerequisite: CHEM 001B with C or better.  
Advisory Level: Read: 3 Write: 3 Math: 3  
Transfer Status: CSU/UC Degree Applicable: AA/AS  
CSU GE: B1, B3 IGETC: None District GE: B1, B3

## CHEM 012B Organic Chemistry 5 Units

The second semester of a year-long organic chemistry course designed to follow Chemistry 12A. Students will study topics including nomenclature, stereochemistry, mechanisms, reactions, and spectroscopic studies of aliphatic and aromatic alcohols, aldehydes, ketones, acids, and other classes of organic and biological compounds. Students will use problem-solving techniques in order to elucidate mechanistic and structural and stereochemical features of reactions and molecules, respectively. In lectures and laboratory students will implement methods that focus on synthesis, isolation, purification, elucidation and identification of organic structures, instrumental methods and data interpretation. (C-ID CHEM 160 when combined with CHEM 012A)

Lecture Hours: 3 Lab Hours: 6 Repeatable: No Grading: L  
Prerequisite: CHEM 012A with C or better.  
Advisory Level: Read: 3 Write: 3 Math: None  
Transfer Status: CSU/UC Degree Applicable: AA/AS  
CSU GE: B1, B3 IGETC: None District GE: B1, B3

**CHEM 015 Fundamentals of Chemistry 4 Units**

Students are introduced to the fundamentals of modern inorganic chemistry with emphasis on atomic structure, chemical bonding, chemical formulas, nomenclature, equations, stoichiometry, gas laws, solutions, and related topics. The central nature of chemistry among other branches of science is stressed, and examples of the important role that chemistry plays in our lives are presented. CHEM 015 is intended primarily as preparation for the CHEM 001A and 001B sequence. The course also meets the general education requirements for a laboratory science. (C-ID CHEM 101)

Lecture Hours: 3 Lab Hours: 3 Repeatable: No Grading: L

Prerequisite: Take MATH 013 with a C or better or placement by multiple measures

Advisory Level: Read: 3 Write: 3 Math: None

Transfer Status: CSU/UC Degree Applicable: AA/AS

CSU GE: B1, B3 IGETC: 5A, 5C District GE: B1, B3

**CHEM 015H Honors Fundamentals of Chemistry 4 Units**

Students are introduced to the fundamentals of modern inorganic chemistry with emphasis on atomic structure, chemical bonding, chemical formulas, nomenclature, equations, stoichiometry, gas laws, solutions, and related topics. The central nature of chemistry among other branches of science is stressed, and examples of the important role that chemistry plays in our lives are presented. CHEM 015 is intended primarily as preparation for the CHEM 001A and 001B sequence. This is an honors course requiring in-depth and analytical applications of stoichiometry and solution chemistry. (C-ID CHEM 101)

Lecture Hours: 3 Lab Hours: 3 Repeatable: No Grading: L

Prerequisite: Take MATH 013 with a C or better

Advisory Level: Read: 4 Write: 4 Math: None

Transfer Status: CSU/UC Degree Applicable: AA/AS

CSU GE: None IGETC: None District GE: None

**CHEM 032A Intro to General, Organic, & Biological Chemistry 4 Units**

Students will learn the basic principles of chemistry with emphasis on descriptive rather than theoretical chemistry. Students will study topics including the scientific method, classification and properties of matter; measurement and the metric system, atomic structure; chemical periodicity; states of matter (e.g. gases, liquids, and solids); chemical nomenclature; ionic and covalent bonding; types of chemical reactions; mass relationships; the mole concept; properties of solutions, electrolytes, acids and bases; chemical equilibria and energetics; and nuclear chemistry. This is a first-semester course in introductory chemistry and is designed to support students majoring in allied health-related fields.

Lecture Hours: 3 Lab Hours: 3 Repeatable: No Grading: L

Advisory Level: Read: 3 Write: 3 Math: 2

Transfer Status: CSU/UC Degree Applicable: AA/AS

CSU GE: B1, B3 IGETC: 5A, 5C District GE: B1, B3

**CHEM 032B Intro to General, Organic, & Biological Chemistry 4 Units**

This second-semester course provides students with an introduction to organic and biochemistry. Topics include classes of organic and biological compounds as they relate to the chemistry of life processes. The course is designed to support students majoring in nursing and other allied health-related fields. The laboratory component will support the course topics while introducing students to both qualitative and quantitative experiments, as well as data analysis and interpretation. (C-ID CHEM 102)

Lecture Hours: 3 Lab Hours: 3 Repeatable: No Grading: L

Prerequisite: CHEM 032A or CHEM 015 or CHEM 001A; all with C or better.

Advisory Level: Read: 3 Write: 3 Math: 2

Transfer Status: CSU/UC Degree Applicable: AA/AS

CSU GE: B1, B3 IGETC: 5A, 5C District GE: B1, B3

**CHEM 061 Introduction to Fermentation Chemistry 3 Units**

Students are introduced to the chemistry of brewing, winemaking, and fermenting of food such as cheese, yogurt, and pickled vegetables. Students will study the general chemical principles of brewing, winemaking, and various types of fermentation.

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L

Prerequisite: MATH 111 with P grade.

Advisory Level: Read: 3 Write: 3 Math: None

Transfer Status: CSU/UC Degree Applicable: AA/AS

CSU GE: B1 IGETC: 5A District GE: B1

**CHEM 065 Quantitative Analysis 4 Units**

Students are introduced to the theory and practice of gravimetric and volumetric analysis. Students will investigate experimental techniques pertinent to electroanalytical and spectrophotometric analytical methods. This course is for students who are interested in pursuing a career as a laboratory technician or who are majoring in chemistry, biochemistry, biology, and bioengineering, and for those who want to gain practical analytical laboratory techniques.

Lecture Hours: 2 Lab Hours: 6 Repeatable: No Grading: L

Prerequisite: CHEM 001B with C or better.

Advisory Level: Read: 3 Write: 3 Math: 3

Transfer Status: CSU/UC Degree Applicable: AA/AS

CSU GE: B1 IGETC: 5A District GE: B1

**CHEM 098 Directed Study 0.5-9 Units**

Individual or small groups of students, with previous course work in the discipline, who would benefit from Independent Study under the direction of faculty members in specific or related disciplines, may develop individualized learning contracts designed to enhance their individual instructional programs. The students and the faculty member in consultation with the Division Dean will determine appropriate learning objectives and activities as well as the number of units to be earned. Instructions and the Learning Contract forms are available in the Division Office. Repeatable to a maximum of 9 units across all disciplines.

Lecture Hours: None Lab Hours: 2.07 Repeatable: Yes Grading: O

Prerequisite: Completion of the following course(s) and project approval is required by sponsoring faculty, division dean, and Vice President of

Academic Affairs: CHEM 015 or CHEM 032A

Advisory Level: Read: 3 Write: 3 Math: None

Transfer Status: CSU Degree Applicable: AA/AS

CSU GE: None IGETC: None District GE: None