CHEMISTRY (CHEM)

CHEM 0001A. General Chemistry I
Units: 5
Prerequisite: Completion of CHEM A or equivalent with grade of "C" or better; and completion of MATH D or MATH G with grade of "C" or better, or placement by matriculation assessment process, or equivalent; and satisfactory score on the Chemistry Placement Examination
Advisory: Eligibility for ENGL C1000 strongly recommended
Hours: 162 (54 lecture, 108 laboratory)
Introduction to the general principles of chemistry with emphasis upon quantitative relationships. Properties of matter related whenever possible to present concepts of atomic structure and to the periodic table. Includes atomic structure, the mole concept, gas laws, stoichiometry, redox, states of matter, solutions, and an introduction to modern theories of chemical bonding through related lecture and laboratory exercises. Students enrolling in CHEM 1A after having completed CHEM 3A will lose credit for CHEM 3A. Note: Not open to students who have completed CHEM 3B. CHEM 1A/1B sequence may be started any semester. (C-ID CHEM 110) (combined with CHEM 1B, C-ID CHEM 120S) (CSU, UC-with unit limitation)

CHEM 0001B. General Chemistry II
Units: 5
Prerequisite: Completion of CHEM 1A or 3B with grade of "C" or better
Advisory: Eligibility for ENGL C1000 strongly recommended
Hours: 162 (54 lecture, 108 laboratory)
A continuation of CHEM 1A. Includes chemical kinetics, equilibrium, acid-base theory, thermodynamics, electro-chemistry, modern theories of bonding, and nuclear chemistry through related lecture and laboratory exercises. Note: CHEM 1A/1B sequence may be started any semester. (combined with CHEM 1A or CHEM 3A/3B, C-ID CHEM 120S) (CSU, UC-with unit limitation)

CHEM 0001X. Problem Solving for Chemistry 1A
Unit: 1
Prerequisite: Completion of CHEM A or equivalent with grade of "C" or better; and completion of MATH D or MATH G with grade of "C" or better, or placement by matriculation assessment process, or equivalent; and satisfactory score on the Chemistry Placement Examination
Corequisite: Concurrent enrollment in CHEM 1A
Advisory: Eligibility for ENGL C1000 strongly recommended
Hours: 18 lecture
Optional problem solving course to accompany CHEM 1A. Students use critical thinking and problem solving strategies to solve general chemistry problems in topics that include atomic structure, the mole concept, gas laws, stoichiometry, redox, intermolecular forces, solid state chemistry, solution chemistry, and chemical bonding. (CSU)

CHEM 0001Y. Problem Solving for Chemistry 1B
Unit: 1
Prerequisite: Completion of CHEM 1A or 3B with grade of "C" or better
Corequisite: Concurrent enrollment in CHEM 1B
Advisory: Eligibility for ENGL C1000 strongly recommended
Hours: 18 lecture
Optional problem solving course to accompany CHEM 1B. Students use critical thinking and problem solving strategies to solve general chemistry problems in topics that include equilibrium, chemical kinetics, acid-base theory, thermodynamics, electro-chemistry, and nuclear chemistry. (CSU)

CHEM 0002A. Introduction to Chemistry I
Units: 5
Prerequisite: Completion of MATH A with grade of "C" or better, or placement by matriculation assessment process, or equivalent
Advisory: Eligibility for ENGL C1000; completion of CHEM A with grade of "C" or better or equivalent; completion of MATH D with grade of "C" or better or equivalent
Hours: 126 (72 lecture, 54 laboratory)
Designed to meet the requirements for certain nursing, dental hygiene, physical therapy, agriculture, and forestry programs (Inorganic Chemistry). An introduction to the fundamental principles of general inorganic chemistry through related lecture and laboratory exercises. (C-ID CHEM 101) (CSU, UC-with unit limitation)

CHEM 0002B. Introduction to Chemistry II
Units: 5
Prerequisite: Completion of CHEM 2A with grade of "C" or better
Advisory: Eligibility for ENGL C1000
Hours: 126 (72 lecture, 54 laboratory)
Designed to meet the requirements for certain nursing, dental hygiene, physical therapy, agriculture, and forestry programs (Organic and Biochemistry). A study of the major classes of organic compounds, including nomenclature structure, properties, and isomerism. Emphasizes the chemistry and metabolism of carbohydrates, lipids, and proteins, including nucleo-protein and enzymes through related lecture and laboratory exercises. (C-ID CHEM 102) (CSU, UC-with unit limitation)

CHEM 0002X. Problem Solving for Chemistry 2A
Unit: 1
Prerequisite: Completion of MATH A with grade of "C" or better, or placement by matriculation assessment process, or equivalent
Corequisite: Concurrent enrollment in CHEM 2A
Advisory: Eligibility for ENGL C1000; completion of CHEM A with grade of "C" or better or equivalent; completion of MATH G with grade of "C" or better or equivalent
Hours: 18 lecture
Optional problem solving course to accompany CHEM 2A. Students use critical thinking and problem solving strategies to solve chemistry problems in topics that include atomic structure, the mole concept, gas laws, stoichiometry, redox, acid-base theory, equilibrium, nuclear chemistry, and chemical bonding. (CSU)

CHEM 0002Y. Problem Solving for Chemistry 2B
Unit: 1
Prerequisite: Completion of CHEM 2A with grade of "C" or better
Corequisite: Concurrent enrollment in CHEM 2B
Advisory: Eligibility for ENGL C1000
Hours: 18 lecture
Optional problem solving course to accompany CHEM 2B. Students use critical thinking and problem solving strategies to solve organic and biochemistry problems. Both lecture and discussion groups utilized. (CSU)

CHEM 0003A. General Chemistry I - Part 1
Units: 3
Prerequisite: Completion of MATH D or MATH G with grade of "C" or better, or placement by matriculation assessment process, or equivalent
Corequisite: Concurrent enrollment in CHEM 3X
Advisory: Eligibility for ENGL C1000 strongly recommended
Hours: 90 (36 lecture, 54 laboratory)
The first semester of a two-semester course in general chemistry consisting of that material normally included in one semester of CHEM 1A. Topics covered include the mole concept, chemical nomenclature, gas laws, and stoichiometry. This sequence fulfills the prerequisite for CHEM 1B. Students enrolling in CHEM 1A after having taken CHEM 3A will lose credit for CHEM 3A. (combined with CHEM 3B, C-ID CHEM 110) (combined with CHEM 3B and 1B, C-ID CHEM 120S) (CSU, UC-with unit limitation)

CHEM 0003B. General Chemistry I - Part 2
Units: 3
Prerequisite: Completion of CHEM 3A with grade of "C" or better
Corequisite: Concurrent enrollment in CHEM 3Y
Advisory: Eligibility for ENGL C1000 strongly recommended
Hours: 90 (36 lecture, 54 laboratory)
The second semester of a two-semester course in general chemistry consisting of that material normally included in one semester of CHEM 1A. Topics include atomic structure, states of matter, solutions, and chemical bonding. This sequence fulfills the prerequisite for CHEM 1B. (combined with CHEM 3A, C-ID CHEM 110) (combined with CHEM 3A and 1B, C-ID CHEM 120S) (CSU, UC-with unit limitation)

CHEM 0003X. Problem Solving for Chemistry 3A
Units: 2
Prerequisite: Completion of MATH D or MATH G with grade of "C" or better, or placement by matriculation assessment process, or equivalent
Corequisite: Concurrent enrollment in CHEM 3A
Advisory: Eligibility for ENGL C1000 strongly recommended
Hours: 36 lecture
Problem solving course to accompany CHEM 3A. Students use critical thinking and problem solving strategies to solve general chemistry problems in topics that include the mole concept, chemical nomenclature, gas laws, and stoichiometry. (pass/no pass grading) (not transferable)

CHEM 0003Y. Problem Solving for Chemistry 3B
Units: 2
Prerequisite: Completion of CHEM 3A with grade of "C" or better
Corequisite: Concurrent enrollment in CHEM 3B
Advisory: Eligibility for ENGL C1000 strongly recommended
Hours: 36 lecture
Problem solving course to accompany CHEM 3B. Students use critical thinking and problem solving strategies to solve general chemistry problems in topics that include atomic structure, chemical bonding, states of matter, and solutions. (pass/no pass grading) (not transferable)

CHEM 0005. Chemistry - Quantitative Analysis
Units: 4
Prerequisite: Completion of CHEM 1B with grade of "C" or better
Advisory: Eligibility for ENGL 11 strongly recommended
Hours: 144 (36 lecture, 108 laboratory)
Theory and techniques of quantitative chemical measurement, including gravimetric, volumetric, and introductory instrumental analysis. Required for all chemistry, chemical engineering, medicine, dentistry, veterinary medicine, and related majors. (CSU, UC)

CHEM 0012A. Organic Chemistry I
Units: 5
Prerequisite: Completion of CHEM 1B with grade of "C" or better
Advisory: Eligibility for ENGL C1000 strongly recommended
Hours: 162 (54 lecture, 108 laboratory)
An extensive course in the chemistry of the compounds of carbon, which emphasizes structure, kinetics, thermodynamics, spectroscopy, and synthesis. The laboratory provides direct experience with the reaction, synthesis, purification, identification, and characterization (IR, GC, TLC, bp, mp, chemical tests) of organic compounds. Discussions about the emerging field of "Green Chemistry" and performance of Green Chemistry experiments in the laboratory. Required for majors in chemistry as well as many other related fields. (C-ID CHEM 150; and, combined with CHEM 12B, C-ID CHEM 160S) (CSU, UC)

CHEM 0012B. Organic Chemistry II
Units: 5
Prerequisite: Completion of CHEM 12A with grade of "C" or better
Advisory: Eligibility for ENGL C1000 strongly recommended
Hours: 162 (54 lecture, 108 laboratory)
Focuses on carbon based molecules and emphasizes structure, kinetics, thermodynamics, spectroscopy, and synthesis. Includes the emerging field of "Green Chemistry." Required for majors in Chemistry as well as many other related fields. (combined with CHEM 12A, C-ID CHEM 160S) (CSU, UC)

CHEM 0012X. Problem Solving for Chemistry 12A
Unit: 1
Corequisite: Concurrent enrollment in CHEM 12A
Hours: 18 lecture
Optional problem solving course to accompany CHEM 12A. Students use critical thinking and problem solving strategies to solve organic chemistry problems in topics that include nomenclature, alkane, alkene, alcohols, stereochemistry, spectroscopy, and Newman projections. (CSU)

CHEM 0012Y. Problem Solving for Chemistry 12B
Unit: 1
Corequisite: Concurrent enrollment in CHEM 12B
Hours: 18 lecture
Optional problem solving course to accompany CHEM 12B. Students use critical thinking and problem solving strategies to solve organic chemistry problems in topics that include nomenclature, alkynes, benzene, esters, amides, and amines. (CSU)

CHEM 0028. Independent Study
Units: 1-3
Designed for students interested in furthering their knowledge at an independent study level in an area where no specific curriculum offering is currently available. Independent study might include, but is not limited to, research papers, special subject area projects, and research projects. See Independent Study page in catalog. (CSU, UC-with unit limitation)

CHEM 0095. Internship in Chemistry
Units: 0.5-4
Designed for advanced students to work in an area related to their educational or occupational goal. Provides new on-the-job technical training under the direction of a worksite supervisor, allowing students to expand knowledge and skills in the chosen field. Mandatory orientation session and faculty approval to determine eligibility. One unit of credit is equal to 54 hours of work. Students may earn up to a total of 16 units in internship courses (any course numbered 95 and PDEV 94). (CSU-with unit limitation)

CHEM 0101. Fundamentals of Chemistry
Units: 4
Formerly known as CHEM A
Prerequisite: Intermediate algebra or higher or eligibility for transfer-level mathematics
Advisory: Eligibility for ENGL C1000
Hours: 108 (54 lecture, 54 laboratory)
The course includes basic chemical laboratory techniques and methods, a survey of important chemical principles with an emphasis on problem-solving, and a description of composition, structure, and properties of matter. It is intended for students who wish to meet general education requirements in physical science or build skills for future chemistry courses. (C-ID CHEM 101) (CSU, UC)

CHEM 0140. Survey of Chemistry and Physics
Units: 4
Also known as PHYS 140
Prerequisite: Completion of MATH D with grade of "C" or better, or placement by matriculation assessment process
Hours: 108 (54 lecture, 54 laboratory)
A conceptual introduction to the basic principles of physics and chemistry including matter, physical and chemical properties, forces and motion, energy, electromagnetism, electromagnetic waves, atomic structure, bonding, solutions and chemical reactions. The inter-dependence of chemistry and physics will be emphasized. This course is intended for non-science majors. (C-ID CHEM/PHYS 140) (CSU, UC)