

# CHEMISTRY

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## Chemistry (CHEM)

Refer to [How to Read Course Descriptions](#) for an explanation of elements found within the course descriptions below.

### CHEM 100 Concepts of Chemistry

(3 Credits, Fall/Spring)

This course is a presentation of the world of chemistry as it impacts society and the individual. Topics include air and water quality, energy and fuels, nuclear power, nutrition and food, medicine and drug design, plastics, acids and bases, oxidation and reduction, and other applications. The emphasis is on the connection of chemistry with everyday life. This course is intended for non-science students; very limited math skills are necessary. This course meets for an equivalent of three hours of lecture per week. COREQ: CHEM 100L. *(This CWI course meets Idaho State Board of Education GEM competency requirements for GEM 4 - Scientific Ways of Knowing.)*. (3 lecture hours, 0 lab hours, 3 credits)

### CHEM 100L Concepts of Chemistry Lab

(1 Credit, Fall/Spring)

This is the required lab course that accompanies CHEM 100, which is a presentation of the world of chemistry as it impacts society and the individual. Topics include air and water quality, energy and fuels, nuclear power, nutrition and food, medicine and drug design, plastics, acids and bases, oxidation and reduction, and other applications. The emphasis is on the connection of chemistry with everyday life. This course is intended for non-science students; very limited math skills are necessary. CHEM 100L satisfies the GEM Scientific Ways of Knowing lab requirement. This course meets for an equivalent of two hours in the laboratory per week. COREQ: CHEM 100. *(This CWI course meets Idaho State Board of Education GEM competency requirements for GEM 4 - Scientific Ways of Knowing.)*. (0 lecture hours, 2 lab hours, 1 credits)

### CHEM 101 Introduction to Chemistry

(3 Credits, Fall/Spring/Summer)

CHEM 101 is an introductory survey course in what is often referred to as General Chemistry. This course is designed to fulfill the needs of three groups of students: those who will be entering health science careers such as nursing, dental hygiene, and radiology; those who have not taken an introductory chemistry course or need review before taking CHEM 111 Principles of Chemistry 1; and those who need a laboratory course for graduation that have an interest in chemistry or related fields. Topics covered in the course include the scientific method, atomic and molecular structure, the periodic table, types of compounds, nomenclature, the mole, gases, solutions, types of reactions, balancing equations, stoichiometry, intermolecular forces, acids and bases, equilibria, and nuclear chemistry. PREREQ: Completion of Units 1-12 of MATH 095 or placement into MATH 143 (or higher). COREQ: CHEM 101L. *(This CWI course meets Idaho State Board of Education GEM competency requirements for GEM 4 - Scientific Ways of Knowing.)*. (3 lecture hours, 0 lab hours, 3 credits)

### CHEM 101L Introduction to Chemistry Lab

(1 Credit, Fall/Spring/Summer)

This is the required lab component to CHEM 101, which is an introductory survey course in what is often referred to as General Chemistry. This course is designed to fulfill the needs of three groups of students: Those who will be entering health science careers such as nursing, dental hygiene and radiology; those who have not taken an introductory chemistry course or need review before taking CHEM 111 Principles of Chemistry 1; and those who need a laboratory course for graduation that have an interest in chemistry or related fields. Topics covered in the course include the scientific method, atomic and molecular structure, the periodic table, types of compounds, nomenclature, the mole, gases, solutions, types of reactions, balancing equations, stoichiometry, intermolecular forces, acids and bases, equilibria, and nuclear chemistry. PREREQ: Completion of Units 1-12 of MATH 095 or placement into MATH 143 (or higher). COREQ: CHEM 101. *(This CWI course meets Idaho State Board of Education GEM competency requirements for GEM 4 - Scientific Ways of Knowing.)*. (0 lecture hours, 3 lab hours, 1 credits)

### CHEM 102 Essentials of Organic and Biochemistry

(4 Credits, Fall/Spring/Summer)

Nomenclature, reactions, and structure/property relationships of organic compounds. Includes the study of the structure and function of proteins, carbohydrates, lipids, and nucleic acids and an introduction to major bioenergetic pathways. PREREQ: CHEM 101 or CHEM 111 with a grade of C or higher, or successful Chemistry placement exam score. COREQ: CHEM 102L. *(This CWI course meets Idaho State Board of Education GEM competency requirements for GEM 4 - Scientific Ways of Knowing.)*. (4 lecture hours, 0 lab hours, 4 credits)

### CHEM 102L Essentials of Organic and Biochemistry Lab

(1 Credit, Fall/Spring/Summer)

This required lab accompanies CHEM 102, which studies the nomenclature, reactions, and structure/property relationships of organic compounds. Includes the study of the structure and function of proteins, carbohydrates, lipids, and nucleic acids and an introduction to major bioenergetic pathways. PREREQ: CHEM 101 or CHEM 111 with a grade of C or higher, or successful Chemistry placement exam score. COREQ: CHEM 102. *(This CWI course meets Idaho State Board of Education GEM competency requirements for GEM 4 - Scientific Ways of Knowing.)*. (0 lecture hours, 3 lab hours, 1 credits)

### CHEM 111 General Chemistry I

(3 Credits, Fall/Spring)

A thorough study of the fundamentals and principles of chemistry. This course is designed for students majoring in chemistry, pre-medicine, pre-dentistry, engineering, or science. The lecture and laboratory will cover inorganic reactions, atomic structure, stoichiometry, thermochemistry, solutions, chemical bonding, and the states of matter. PREREQ: CHEM 101 with a grade of C or higher or successful Chemistry placement exam score. COREQ: CHEM 111L. PRE/COREQ: MATH 143, MATH 143P, or MATH 147 (or higher math course). *(This CWI course meets Idaho State Board of Education GEM competency requirements for GEM 4 - Scientific Ways of Knowing.)*. (3 lecture hours, 0 lab hours, 3 credits)

**CHEM 111L General Chemistry I Lab**

(1 Credit, Fall/Spring)

This required lab accompanies CHEM 111, which is a thorough study of the fundamentals and principles of chemistry. This course is designed for students majoring in chemistry, pre-medicine, pre-dentistry, engineering, or science. The lecture and laboratory will cover inorganic reactions, atomic structure, stoichiometry, thermochemistry, solutions, chemical bonding, and the states of matter. PREREQ: CHEM 101 with a grade of C or higher or successful Chemistry placement exam score. COREQ: CHEM 111. PRE/COREQ: MATH 143, MATH 143P, or MATH 147 (or higher math course). (This CWI course meets Idaho State Board of Education GEM competency requirements for GEM 4 - Scientific Ways of Knowing.). (0 lecture hours, 3 lab hours, 1 credits)

**CHEM 112 General Chemistry II**

(3 Credits, Fall/Spring)

A thorough study of the fundamentals and principles of chemistry. This course is designed for students majoring in chemistry, pre-medicine, pre-dentistry, engineering, or science. The lecture and laboratory will cover solutions, kinetics, equilibrium, acid/base reactions, thermochemistry, and electrochemistry. PREREQ: CHEM 111 with a grade of C or higher, and MATH 143 or MATH 147. COREQ: CHEM 112L. (3 lecture hours, 0 lab hours, 3 credits)

**CHEM 112L General Chemistry II Lab**

(2 Credits, Fall/Spring)

This required lab accompanies CHEM 112, which is a thorough study of the fundamentals and principles of chemistry. This course is designed for students majoring in chemistry, pre-medicine, pre-dentistry, engineering, or science. The lecture and laboratory will cover solutions, kinetics, equilibrium, acid/base reactions, thermochemistry, and electrochemistry. PREREQ: CHEM 111 with a grade of C or higher, and MATH 143 or MATH 147. COREQ: CHEM 112. (0 lecture hours, 6 lab hours, 2 credits)

**CHEM 190 Math Skills for Chemistry**

(1 Credit, Fall/Spring)

A mathematics review and accelerated treatment of mathematically-based chemistry problems. Topics include significant figures in measurements and calculations, the metric system, unit conversions, rearranging equations to solve for unknowns, using dimensional analysis and other techniques to solve problems regarding density, specific heat, the mole, stoichiometry, limiting reactants, percentage composition of compounds, and gas laws. COREQ: CHEM 101 or CHEM 111. (1 lecture hours, 0 lab hours, 1 credits)

**CHEM 199 Chemistry Special Topics**

(1-5 Credits, Varies)

This course is designed to permit the offering of special topics appropriate to a student's program. Regular or frequently recurring topics are not offered under this title. The course may be repeated as new topics are presented. (1 lecture hours, 0 lab hours, 1 credits)

**CHEM 253 Quantitative Analysis**

(3 Credits, Varies)

The lecture includes a comprehensive study of the principles and techniques of the laboratory procedures as well as the theoretical basis of gravimetric, volumetric, and instrumental analysis. PREREQ: CHEM 112 with a grade of C or higher or PERM/INST. COREQ: CHEM 253L. (3 lecture hours, 0 lab hours, 3 credits)

**CHEM 253L Quantitative Analysis Lab**

(2 Credits, Varies)

This required lab accompanies CHEM 253 and consists of a series of quantitative determinations of elemental unknowns by classical and instrumental methods. PREREQ: CHEM 112 with a grade of C or higher or PERM/INST. COREQ: CHEM 253. (0 lecture hours, 6 lab hours, 2 credits)

**CHEM 293 Chemistry Internship**

(1-3 Credits, Varies)

Internships allow students to apply learning to real-life career possibilities. Credits are earned through supervised fieldwork specifically related to a student's area of study. An Internship Registration Form must be completed and turned into a One Stop Student Services location before a student may register for an internship course. PREREQ: Permission of department's internship coordinator and submission of a completed Internship Registration Form. (0 lecture hours, 3 lab hours, 1 credits)

**CHEM 298 Organic Chemistry I**

(3 Credits, Fall)

This is the first course in a comprehensive study of organic chemistry emphasizing the structure of functional groups, nomenclature, physical and chemical properties, and reactions of organic compounds. Reaction mechanisms of multiple reactions, as well as the multi-step synthesis of more complicated compounds, are incorporated. An introduction to spectroscopic methods (IR, NMR, and MS) utilized in structural determination will be given. PREREQ: CHEM 112 with a grade of C or higher. COREQ: CHEM 298L. (3 lecture hours, 0 lab hours, 3 credits)

**CHEM 298L Organic Chemistry I Lab**

(1 Credit, Fall)

This required lab accompanies CHEM 298, which is the first course in a comprehensive study of organic chemistry emphasizing the structure of functional groups, nomenclature, physical and chemical properties, and reactions of organic compounds. Reaction mechanisms of multiple reactions, as well as the multi-step synthesis of more complicated compounds, are incorporated. An introduction to spectroscopic methods (IR, NMR, and MS) utilized in structural determination will be given. PREREQ: CHEM 112 with a grade of C or higher. COREQ: CHEM 298. (0 lecture hours, 3 lab hours, 1 credits)

**CHEM 299 Organic Chemistry II**

(3 Credits, Spring)

A continuation of CHEM 298, this is the second course in a comprehensive study of organic chemistry emphasizing the structure of functional groups, nomenclature, physical and chemical properties, and reactions of organic compounds. Reaction mechanisms of multiple reactions, as well as the multi-step synthesis of more complicated compounds, are incorporated. An introduction to spectroscopic methods (IR, NMR, and MS) utilized in structural determination is expanded. PREREQ: CHEM 298 with a grade of C or higher. COREQ: CHEM 299L. (3 lecture hours, 0 lab hours, 3 credits)

**CHEM 299L Organic Chemistry II Lab**

(2 Credits, Spring)

This required lab accompanies CHEM 299, which is a continuation of CHEM 298. This is the second course in a comprehensive study of organic chemistry emphasizing the structure of functional groups, nomenclature, physical and chemical properties, and reactions of organic compounds. Reaction mechanisms of multiple reactions, as well as the multi-step synthesis of more complicated compounds, are incorporated. An introduction to spectroscopic methods (IR, NMR, and MS) utilized in structural determination is expanded. PREREQ: CHEM 298 with a grade of C or higher. COREQ: CHEM 299. (1 lecture hours, 3 lab hours, 2 credits)