

CHEMISTRY (CHEM)

QUICK FACTS: CHEM COURSES

- **Instructional School:** Science, Technology, and Math
- **Department:** Physical Sciences

CHEM 100 Concepts of Chemistry

(3 Credits, Fall/Spring)

Examination of the world of chemistry as it impacts society and the individual through the theme of forensic science. Basic concepts include structure, properties of matter, chemical changes, chemical conversions, chemical bonding, acid-base chemistry, and interactions of matter and energy. This course is intended for non-science students; very limited math skills are necessary. 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)

Accompanies CHEM 100. Basic concepts include structure, properties of matter, chemical changes, chemical conversions, chemical bonding, acid-base chemistry, and interactions of matter and energy. Chemistry concepts are learned through experiments that can be done in a kitchen with household products. This course is intended for non-science students; very limited math skills are necessary. 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)

This introductory chemistry course is designed for students with varying levels of prior exposure to the subject, aiming to provide an understanding of the fundamental principles governing matter and its transformations. The curriculum covers topics such as atomic structure, periodic trends, the periodic table, chemical bonding, molecular geometry, types of reactions, stoichiometry, the behavior of gases, liquids, and solids, equilibria, and nuclear chemistry. Throughout the course, there is an emphasis on the development of problem-solving skills and the practical application of theoretical concepts to real-world scenarios. PREREQ: Placement into MATH 143P. PRE/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 laboratory course complements the theoretical foundations established in the introductory chemistry lecture course, providing students with the opportunity to explore the practical aspects of chemistry and bridge the gap between theory and experimentation. Engaging in a variety of experiments, students reinforce and expand upon key concepts, including essential laboratory techniques, measurements, and safety procedures, laying a solid foundation for more advanced experiments in subsequent courses. Proficiency in the use of laboratory equipment and data analysis tools is a focal point of the course. Emphasis is placed on fostering critical thinking skills, meticulous record-keeping, and effective communication of experimental findings. PREREQ: Placement into MATH 143P. PRE/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)

Study of the nomenclature, reactions, structure, and 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. PRE/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)

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. PRE/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 110 General Chemistry I Plus

(2 Credits, Fall/Spring)

This course provides additional instruction and support for CHEM 111 General Chemistry I and CHEM 112 General Chemistry II. Topics include measurements, inorganic reactions, atomic structure, stoichiometry, thermochemistry, solutions, chemical bonding, and the states of matter. This class may be taken before or at the same time as CHEM 111P. PREREQ: Placement into MATH 143P or higher. (1 lecture hours, 2 lab hours, 2 credits)

CHEM 111 General Chemistry I

(3 Credits, Fall/Spring)

Explore the fundamentals and principles of chemistry, including measurement, inorganic reactions, atomic structure, stoichiometry, thermochemistry, solutions, chemical bonding, and the states of matter. In this course, we will build on your introductory chemistry knowledge beginning with the basics of the atom and its behavior, then progress to the chemical properties of matter, chemical changes, and reactions. This course will provide you with the tools to understand and appreciate many of the chemical and energetic phenomena that are visible and invisible in life. This course is designed for students majoring in chemistry, pre-medicine, pre-dentistry, engineering, or natural science. NOTE: Students may be eligible to enroll in this course without prior completion of CHEM 101 if they are concurrently enrolled in MATH 160 or MATH 170; instructor permission would be required. PREREQ: CHEM 101, MATH 160, or MATH 170 with a grade of C or higher, or a successful Chemistry placement exam score. PRE/COREQ: CHEM 111L; and MATH 143 or MATH 147. *(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 lab accompanies General Chemistry I (CHEM 111 or CHEM 111P), 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. PRE/COREQ: CHEM 111 or CHEM 111P; and MATH 143 or MATH 147. *(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 111P General Chemistry I

(3 Credits, Fall/Spring)

Explore the fundamentals and principles of chemistry, including measurement, inorganic reactions, atomic structure, stoichiometry, thermochemistry, solutions, chemical bonding, and the states of matter. In this course, we will build on your introductory chemistry knowledge beginning with the basics of the atom and its behavior, then progress to the chemical properties of matter, chemical changes, and reactions. This course will provide you with the tools to understand and appreciate many of the chemical and energetic phenomena that are visible and invisible in life. This course is designed for students majoring in chemistry, pre-medicine, pre-dentistry, engineering, or natural science. PRE/COREQ: CHEM 110 and CHEM 111L; and MATH 143 or MATH 147. *(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 112 General Chemistry II

(3 Credits, Fall/Spring)

Explore the fundamentals and principles of chemistry, including solutions, kinetics, equilibrium, acid/base reactions, thermochemistry, and electrochemistry. CHEM 112 picks up where CHEM 111 ended and continues investigating novel topics. This course will provide you with the tools to understand if, at what rate, and to what extent a process will occur. Using this knowledge, you will be able to evaluate the theories of cold and heat death of the universe. This course is designed for students majoring in chemistry, pre-medicine, pre-dentistry, engineering, or science. PREREQ: CHEM 111 (or CHEM 111P) and CHEM 111L with C grades or higher. PRE/COREQ: CHEM 112L. (3 lecture hours, 0 lab hours, 3 credits)

CHEM 112L General Chemistry II Lab

(2 Credits, Fall/Spring)

This 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 (or CHEM 111P) and CHEM 111L with C grades or higher. PRE/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. (Pass/No Pass) 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. PRE/COREQ: CHEM 253L. (3 lecture hours, 0 lab hours, 3 credits)

CHEM 253L Quantitative Analysis Lab

(2 Credits, Varies)

This 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. PRE/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. PREREQ: PERM/INST. (0 lecture hours, 3 lab hours, 1 credits)

CHEM 298 Organic Chemistry I

(3 Credits, Varies)

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. PRE/COREQ: CHEM 298L. (3 lecture hours, 0 lab hours, 3 credits)

CHEM 298L Organic Chemistry I Lab

(2 Credits, Varies)

This 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. PRE/COREQ: CHEM 298. (1 lecture hours, 3 lab hours, 2 credits)

CHEM 299 Organic Chemistry II

(3 Credits, Varies)

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. PRE/COREQ: CHEM 299L. (3 lecture hours, 0 lab hours, 3 credits)

CHEM 299L Organic Chemistry II Lab

(2 Credits, Varies)

This 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. PRE/COREQ: CHEM 299. (1 lecture hours, 3 lab hours, 2 credits)

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