

# CHEMISTRY (CHEM)

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## CHEM 1111 Basic Chemistry 3 Credits (3)

For students whose preparatory science or math training has been deficient. Does not meet the chemistry requirement in any curriculum.

**Prerequisite(s):** Enhanced ACT composite score of at least 18 or a grade of C- or better in CCDM 114 N

### Learning Outcomes

1. The goals and objectives for CHEM 1111 are to equip students with the necessary problem solving skills to be successful in CHEM 1216C/1226C

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## CHEM 1120G Introduction to Chemistry Lecture and Laboratory (non majors) 4 Credits (4)

This course covers qualitative and quantitative areas of non-organic general chemistry for non-science majors and some health professions. Students will learn and apply principles pertaining, but not limited to, atomic and molecular structure, the periodic table, acids and bases, mass relationships, and solutions. The laboratory component introduces students to techniques for obtaining and analyzing experimental observations pertaining to chemistry using diverse methods and equipment. (3+3P)

**Prerequisite(s):** CCDM 114 or MATH 1215 or higher

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## CHEM 1121 General Supplemental Instruction I 1 Credit (1)

Collaborative workshop for students in General Chemistry I. Course does not count toward departmental degree requirements. Repeatable: for a maximum of 2 credits.

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## CHEM 1122 General Supplemental Instruction II 1 Credit (1)

Collaborative workshop for students in General Chemistry II. Course does not count toward departmental degree requirements. Repeatable: for a maximum of 2 credits.

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## CHEM 1123 Principles of Supplemental Instruction III 1 Credit (1)

Collaborative workshop for students in CHEM 110G, Principles and Applications of Chemistry. Does not count toward departmental degree requirements. Repeatable: for maximum of 2 credits.

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## CHEM 1215G General Chemistry I Lecture and Laboratory for STEM majors 4 Credits (4)

This course covers descriptive and theoretical chemistry. (3+3P)

**Prerequisite(s):** (1) grade of C- or better in MATH 1215 or higher, or a Mathematics Placement Exam Score adequate to enroll in mathematics courses beyond MATH 1215

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## CHEM 1216 General Chemistry I 4 Credits (4)

As the first of a two-semester sequence, this course teaches fundamental concepts in chemistry, including the electronic structure of atoms, chemical periodicity, nature of chemical bonds, molecular structure, the three phases of matter, etc. Designed for majors in chemical and other physical sciences, including engineering. May be appropriate for the life science major. It is assumed that the students are familiar with college algebra, chemical nomenclature, stoichiometry, and scientific measurements. The laboratory component is designed to complement the theory and concepts presented in lecture, and will introduce students to techniques for obtaining and analyzing experimental observations pertaining to chemistry using diverse methods and equipment. (3+3P) Provides lab.

**Prerequisite(s):** Eligible to take MATH 1250G and an ACT composite score of 22 or higher

### Provides Lab

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## CHEM 1225G General Chemistry II Lecture and Laboratory for STEM Majors 4 Credits (4)

This course is intended to serve as a continuation of general chemistry principles for students enrolled in science, engineering, and certain preprofessional programs. The course includes, but is not limited to a theoretical and quantitative coverage of solutions and their properties, kinetics, chemical equilibrium, acids and bases, entropy and free energy, electrochemistry, and nuclear chemistry. Additional topics may include (as time permits) organic, polymer, atmospheric, and biochemistry. The laboratory component is designed to complement the theory and concepts presented in lecture, and will introduce students to techniques for obtaining and analyzing experimental observations pertaining to chemistry using diverse methods and equipment.

**Prerequisite(s):** C- or better in CHEM 1215G

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## CHEM 1226 General Chemistry II 4 Credits (4)

As the second of a two-semester sequence, this course teaches fundamental concepts in chemistry, including solutions, equilibria, electrochemistry, thermodynamics and kinetics. Designed for majors in chemical and other physical sciences, including engineering. May be appropriate for the life science major. It is assumed that the students are familiar with college algebra, chemical nomenclature, stoichiometry, and scientific measurements. The laboratory component is designed to complement the theory and concepts presented in lecture, and will introduce students to techniques for obtaining and analyzing experimental observations pertaining to chemistry using diverse methods and equipment. (3+3P) Provides lab.

**Prerequisite(s):** C- or better in CHEM 1216

### Provides Lab

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**CHEM 2111 Explorations in Chemistry 1 Credit (1)**

The major intent of this course is to deepen your interest in chemistry and make you aware of research and career opportunities in the field. During this semester we hope to discuss both old and new developments in chemistry that impact our lives. We also want to build our communication skills that are so necessary in our profession.

**Learning Outcomes**

1. Understand how to use the road map for the B.S. or B.A. in Chemistry to develop a curriculum plan toward degree completion.
2. Become familiar with Chemistry and related student organizations for potential participation.
3. Understand the breadth of available undergraduate research opportunities and related training programs.
4. Identify potential career paths for students graduating with a degree in Chemistry.
5. Become familiar with resources available for exploring current topics in Chemistry.

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**CHEM 2115 Survey of Organic Chemistry and Laboratory 4 Credits (4)**

This course is a one -semester survey of organic and biological chemicals. Students will be introduced to nomenclature, molecular structure, properties, and reactions of hydrocarbons, alcohols, carbonyls, organic acids and bases, carbohydrates, lipids, and proteins. The handling of organic chemicals, simple organic reactions, tests for functional groups, and synthesis will be learned in the laboratory component of this course. (3+3P) Provides lab.

**Prerequisite(s):** C- or better in CHEM 1225G or CHEM 1226

**Provides Lab**

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**CHEM 2120 Integrated Organic Chemistry and Biochemistry 3 Credits (3)**

This course is a one semester introduction to Organic Chemistry and Biochemistry designed for students in health and environmental occupations. The course surveys organic compounds in terms of structure, physical, and chemical properties, followed by coverage of the chemistry of specific classes of organic compounds in the biological environment. students will apply course concepts to everyday organic and biological chemistry problems in preparation for careers in health and environmental fields.

**Learning Outcomes**

1. Identify and name basic organic compounds.
2. Construct/draw organic compounds from the names.
3. Predict the products of certain organic chemical reactions from reagents and conditions presented.
4. Recognize and name the four basic bioorganic units and certain of their derivatives and macromolecules.
5. Compare and contrast the function and location of the four bioorganic units and their macromolecules and cofactors.
6. Draw/recognize stereochemistry and explain its relevance to bioorganic molecules.
7. Discuss the pathways and functions of some of the cellular metabolic processes.
8. Recognize and describe metabolic cellular processes and macromolecular structure with respect to health and/or disease states.

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**CHEM 2226 General Chemistry III 3 Credits (3)**

Quantitative aspects of general chemistry: solid state structure, equilibrium, thermodynamics, and kinetics. Required of chemical science majors who have taken CHEM 1215G/1225G. (2+3P)

**Prerequisite(s):** CHEM 1225G

**Learning Outcomes**

1. describe the process of scientific inquiry
2. solve problems scientifically
3. communicate scientific information
4. apply quantitative analysis to scientific problems
5. apply scientific thinking to real world problems

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**CHEM 2991 Directed Research in Chemistry 3 Credits (3)**

Techniques and procedures of chemical research. (3+9P)Repeatable: for a maximum of 3 credits.

**Prerequisite(s):** 8 credits of chemistry and a 3.0 GPA in chemistry

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**CHEM 2996 Topics in Chemistry 1-6 Credits**

Specific subjects in Chemistry. These subjects will be announced in the Schedule of Classes. Repeatable: under different topics for a maximum of 12 credits.

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