

# CHEMISTRY (CEM)

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## CEM 101 Introductory Chemistry (4 Credits)

45 lecture, 45 lab, 4 total contact hours

In this course, students are introduced to the general concepts of chemistry such as the states of matter, classification of compounds, atomic structure, density, types of chemical reactions, gas laws and stoichiometry. Students will explore best practices and use chemical laboratory procedures to perform experiments, collect data and calculate results. Students with no background in high school chemistry or who have not had high school chemistry for 4 or more years may wish to take this class before taking CEM 105 or CEM 111. Level I Prerequisite: Academic Reading and Writing Levels of 6; Academic Math Level 3

## CEM 105 Fundamentals of Chemistry (4 Credits)

45 lecture, 45 lab, 4 total contact hours

In this course, students explore a broad survey of the major topics in Chemistry (including states of matter, physical and chemical changes, stoichiometry, atomic and molecular structure, gases and gas laws, electronic structure, periodic properties, chemical bonding, energy and heat, intermolecular forces, acids/bases and redox reactions). This course is designed for students with an interest in nursing, other health related areas, and those needing a general science elective. Level I Prerequisite: Academic Reading and Writing Levels of 6; Academic Math Level 3; high school chemistry taken in the 5 years prior to enrolling in this course or CEM 101, minimum grade "C"

## CEM 111 General Chemistry I (4 Credits)

45 lecture, 45 lab, 4 total contact hours

In this course, students will learn the major topics in chemistry including states of matter, physical and chemical changes, stoichiometry, atomic and molecular structure, chemical bonding, thermochemistry and intermolecular forces. It is intended for students in a professional or pre-professional curriculum. Students need intermediate algebra skills to be successful in this course. Level I Prerequisite: Academic Reading and Writing Levels of 6; MTH 169 or higher (excludes MTH 178); high school chemistry (taken within last 5 years) or CEM 101 (taken within last 5 years), minimum grade "C" all CEM, MTH and high school requirements

## CEM 122 General Chemistry II (4 Credits)

45 lecture, 45 lab, 4 total contact hours

In this course, students will explore the concepts of chemical kinetics, chemical equilibrium, chemical thermodynamics and electrochemistry. They will apply the scientific process of collecting and recording data to calculate and analyze lab results as well as draw conclusions. The ability to solve mathematical equations involving logarithms and exponentials is essential for success in this course. This course is the second of a two-course sequence in general chemistry for pre-professional and liberal arts students. Level I Prerequisite: Academic Reading and Writing Levels of 6; CEM 111 (within past 5 years) and MTH 176, both minimum grade "C"

## CEM 140 Organic Biochemistry (4 Credits)

45 lecture, 45 lab, 4 total contact hours

This course is an introduction to both organic chemistry and biochemistry for nursing and other health services students. Major topics covered are the structure and functional groups of organic compounds, structures of biological molecules, mechanism of enzyme-catalyzed reactions, metabolism and bioenergetics. Level I Prerequisite: Academic Reading and Writing Levels of 6; CEM 105 or CEM 111, minimum grade "C"

## CEM 211 Organic Chemistry I (4 Credits)

45 lecture, 45 lab, 4 total contact hours

This course is the first in a two-semester sequence in organic chemistry. Students will learn the nomenclature of organic compounds, stereochemistry, preparation and reactions of aliphatic and aromatic compounds. In the laboratory, students will practice the preparation and handling of organic compounds, including purifying and characterizing organic compounds. Level I Prerequisite: Academic Reading and Writing Levels of 6; Academic Math Level 3; CEM 122 minimum grade "C"

## CEM 222 Organic Chemistry II (4 Credits)

45 lecture, 45 lab, 4 total contact hours

This course is the second of a two-semester sequence. In this course, students will continue to learn nomenclature, stereochemistry, preparations, and reactions of organic compounds (aromatic compounds, organic oxygen and sulfur compounds, carbonyl compounds, carboxylic acids, amines) and biological compounds. Students will apply this knowledge by developing reaction sequences that can be used to synthesize various organic compounds from given starting materials. In the laboratory, students will learn how to synthesize and isolate organic compounds and then characterize them using spectroscopic methods. Level I Prerequisite: Academic Reading and Writing Levels of 6; Academic Math Level 3; CEM 211 minimum grade "C"