

# CHEMISTRY (CHEM)

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## **CHEM 1121 Credits: 4**

### **Chemistry 1 Total Hours: 120**

This course emphasizes the basic principles of structural chemistry, with application to the chemistry of the elements. The course introduces quantum mechanics, polymers, biopolymers and the importance of chemistry to society. The laboratory illustrates the behavior of chemical systems and some of the basic techniques associated with quantitative chemical experimentation. Chemistry 1 is designed for students seeking a degree or diploma in a field of science, technology, or health, among others. Both the lab and lecture portions need to be passed in order to pass the course. It is also suitable as an elective course.

**Pre-requisite(s):** Chemistry 12 (or CHEM 0983/0993) with a minimum 'C+' grade or equivalent; and Pre-calculus 12 with a minimum 'C+' grade, or MATH 1020 with a minimum 'C' grade, or Math 0983 and Math 0993 both with a minimum 'C+' grade, or VCC Math Pre-calculus Test (MPT) with a minimum 72%

## **CHEM 1130 Credits: 2.5**

### **Chemistry for Health Sciences Total Hours: 48**

This course is designed to introduce the student to basic concepts of chemistry including safety, properties of substances, atomic structure, periodic trends, bonding, chemical reactions, the mole concept, solutions, and the gas laws.

## **CHEM 1223 Credits: 4**

### **Chemistry 2 Total Hours: 120**

The second course of the CHEM 1121/1223 two-course sequence emphasizes the basic principles of chemical kinetics, chemical thermodynamics and organic chemistry. The laboratory in Chemistry 2 allows students to practice techniques learned in Chemistry 1. Students are expected to increase skills in making observations, recording data accurately, interpreting data and generating hypotheses. Both the lab and lecture portions need to be passed in order to pass the course. Chemistry 2 is designed for students seeking a degree or diploma in a field of science, technology, or health, among others. It is suitable as an elective course.

**Pre-requisite(s):** CHEM 1121 with a minimum 'C-' grade

## **CHEM 2130 Credits: 4**

### **Organic Chemistry 1 Total Hours: 120**

This course provides a firm grounding in basic principles and commences with a review of fundamental theories of covalent bonding to understand the structure and shape of organic molecules. By studying of the characteristic reactions of the common functional groups, the fundamental conceptual framework of this branch of science is presented. Examination of the chemistry of the alkanes, alkenes, alkynes is continued from first year chemistry. Alkyl halides, alcohols, aldehydes and ketones, ethers and FT-IR Spectroscopy are now discussed. The importance of stereochemistry is revisited throughout the course. The concepts of molecular conformation as well as handedness of shapes are reinforced. Emphasis is placed on the study of reaction mechanisms and the understanding of reaction pathways as presented in energy diagrams. The relationship between the structure of organic molecules and their reactivity is presented. The role of acid/base chemistry in these reactions is presented throughout. The laboratory component of the course complements the lecture material and gives students experience in using some basic techniques that are employed in modern chemistry laboratories.

**Pre-requisite(s):** CHEM 1223 with a 'C-'

## **CHEM 2230 Credits: 4**

### **Organic Chemistry 2 Total Hours: 120**

This second half of organic chemistry continues the examination of the reactions of common functional groups. Aromatic compounds including phenols, aldehydes and ketones, amines, carboxylic acids and their derivatives are studied. Concepts presented in the first half are reinforced. Attention to stereochemistry and regiochemistry are emphasized. Greater skill in designing organic syntheses is developed. To establish the contribution of organic chemistry to other sciences biochemical topics are highlighted. Topics include amino acids, peptides, proteins, phospholipids, terpenes, steroids and nucleic acids. The fundamental concepts of reactivity and functionality are underscored to illustrate their role in the understanding of living materials and processes. NMR Spectroscopy is introduced and the importance of spectroscopic techniques in the analysis of organic compounds is presented. These techniques will be used in the laboratory component of the course.

**Pre-requisite(s):** CHEM 2130 with a 'C-'