
Chemistry

Faculty

Professor:.....Rynd
Associate Professor:.....Lin
Assistant Professor:.....Johnson
Instructor:.....Pichaj

Objectives

While primarily providing service courses for other programs, the department does offer two programs with chemistry as the major component. These are Biochemistry and Physical Science with a chemistry emphasis.

Since chemistry is the study of matter and the changes it undergoes, sequences of courses are designed to meet the needs of students as they prepare for a variety of different majors that require an understanding of the nature of matter. The objective of these courses is to provide the student with a basic understanding of the laws of theories of chemistry such that the student will be able (1) to explain the basic physical and chemical properties of matter in terms of its structure, (2) to do quantitative problem solving, (3) to gain some level of proficiency in laboratory methodology, and (4) to be acquainted with basic resource material in chemistry.

Degree Program

A Bachelor of Science degree in Physical Science with a Chemistry emphasis is offered. The requirements for this major are given under the Physical Science Department. The Biochemistry Program is given below.

Minor

A Chemistry Minor requires the completion of 21 units, including the following courses: Chemistry 105, 106, 301, 302, 311, 312, and either 350 or 411, 422 A, 422 B. Six distinct chemistry minor units apart from any other major or minor.

Biochemistry

Biochemistry is the study of the chemistry of living systems. This interdisciplinary program draws upon biology and chemistry.

Objectives

The major is designed especially for those students planning a career in the health professions. The requirements for schools of medicine, pharmacy, dentistry and medical technology are met within this major. This program also prepares one for graduate school in a variety of bioscience programs. There are excellent opportunities for careers in biotechnical, pharmaceutical and environmental related businesses and governmental agencies.

Degree Program

A Bachelor of Science degree in Biochemistry is offered upon completion of the university baccalaureate and major requirements. The biochemistry major consists of 61 units of chemistry, biology, physics and math courses. Required lower division (28 units) are: Chemistry 105, 106; Biology 111, 112; Physics 111, 112 or 132, 233; Math 105. Required upper division (25 units) are: Chemistry 301, 302, 311, 312, 350, 422 A, 422 B; Biology 312, 411, 412; Physical Science 460 (or Biology 470). Electives (8 units, of which 4 must be upper division) to be chosen from: Chemistry 420, 480; Biology 281, 282, 311, 322, 342, 402, 431; Physics 234, 321, 450.

Note: The general education requirement for mathematics and science is met within this major. The foreign language requirement is met by two years in high school or four units of college foreign language.

Courses (CHEM)

(Chemistry and Biochemistry)

- CHEM 091 Basic Chemistry A.....2**
This course is designed for students planning to enroll in Chemistry 112 (Principles of Organic and Biochemistry) but did not score sufficiently well on the Chemistry Placement Exam. Offered in the fall. Units do not count toward graduation requirements.
- CHEM 092 Basic Chemistry B.....2**
This course is designed for students planning to enroll in Chemistry 105 (General Chemistry) who did not pass the Chemistry Placement Exam. Offered in the spring. Units do not count toward graduation requirements.
- CHEM 100 The Material World3**
The basic principles of chemistry for the non-science major. Uses materials of modern society as a theme for exploring the properties and structure of matter as well as the methods and consequences of transforming natural resources to consumer products.

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- CHEM 105 General Chemistry I.....4**
- CHEM 106 General Chemistry II.....4**
Principles and theories of the structure and properties of matter. Chemistry 105 includes stoichiometry, atomic theory, the periodic table, chemical bonding, molecular structure, nomenclature, chemical reactions, states of matter, gas laws and solutions. Prerequisites for 105: high school chemistry or Chemistry 092, two years of high school algebra and a passing grade on the Chemistry Placement Exam. Chemistry 106 includes chemical kinetics, equilibrium, thermodynamics, solubility, acidity, electrochemistry, coordination complexes and various special topics. Prerequisite: Chemistry 105. Lab fee: \$60 each semester.
- CHEM 110 Chemistry Topics 1-4**
Various topics in introductory chemistry. Prerequisite: department approval.
- CHEM 112 Principles of Organic and Biochemistry.....5**
Chemical bonding, structure, properties and reactivity applied to organic and biochemical compounds. Includes basic metabolic processes and nuclear chemistry with application to medicine and health. Meets the Nursing requirement in chemistry. Four hours lecture and three hours lab. Prerequisite: passing grade on Chemistry Placement Exam, Chemistry 91 or 105 with at least C+. Lab fee: \$40.
- CHEM 301 Organic Chemistry.....3**
- CHEM 302 Organic Chemistry.....3**
Structure, properties and reactivity of carbon-containing compounds with emphasis on reaction mechanisms. Applications to biological systems are integrated through out the course. Concurrent or prior enrollment in Chemistry 311, 312 required. Prerequisite: 106.
- CHEM 311 Laboratory in Organic Chemistry.....1**
- CHEM 312 Laboratory in Organic Chemistry.....1**
The laboratory portion of Chemistry 301, 302 which must be taken concurrently. Techniques for the synthesis, characterization, identification and isolation, of organic compounds. (3 hour laboratory) Lab fee: \$75.
- CHEM 350 Analytical Chemistry.....5**
A survey of classical chemical methods of analysis such as titrimetric and gravimetric along with various instrumental methods including electrochemical, spectroscopic and chromatographic. Three hours lecture, six hours laboratory. Prerequisite: 301. Lab fee: \$80.
- CHEM 411 Biochemistry I.....3**
- CHEM 412 Biochemistry II.....3**
Fundamental concepts of metabolism, bioenergetics, biosynthesis and other chemistry of life processes. Three hours lecture. Prerequisite: 302.
- CHEM 420 Special Topics in Chemistry.....3**
Short subjects in such areas as the chemical literature, various instrumental methods, polymers, organometallics and industrial chemistry. Prerequisite: departmental approval.
- CHEM 422 A Laboratory in Biochemistry.....1**
- CHEM 422 B Laboratory in Biochemistry.....1**
A laboratory course to accompany Biology 411, 412 (Chemistry 411, 412). The isolation, characterization and analysis of biomolecules including the use of biochemical instrumentation and methodology for work in protein structure, enzymology, metabolism and genetics. Prerequisite: Chemistry 302. Lab fee: \$60.
- CHEM 480 Special Project in Chemistry 1-3**
Research or industrial internship. Requires a written report. Prerequisite: departmental approval.
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