

CHEM 3027 Materials Testing and Characterization (3,3,0)

Prerequisite: CHEM 3037 Physical Chemistry I or CHEM 2046 Physical and Inorganic Chemistry or consent of Instructors

Basic principles, methodologies, and instrumentation concerning major techniques for the characterization of the bulk properties of solid will be discussed. Emphasis will be placed on applications of the techniques in the characterization of materials of industrial importance, such as polymers, catalysts and adsorbents, electronic and other functional materials.

CHEM 3035 Integrated Laboratory for Analytical & Testing Sciences (1,0,3)

Prerequisite: CHEM 2015 Analytical Chemistry or CHEM 3005 Instrumental Analysis

This course aims to allow students to integrate the knowledge and the techniques gained in analytical chemistry and instrumental analysis in solving real analytical problems encountered in the analytical and testing industry.

CHEM 3036 Biochemistry (3,3,0)

Prerequisite: CHEM 2009 Organic Chemistry II or CHEM 2036 Fundamentals of Organic Chemistry

This semester course introduces the principles of Biochemistry with special reference to the common needs of chemistry students. This course is to comprehensively provide students a basic understanding of the enzymatic kinetics, structures and properties of biomolecules, their metabolisms in living organisms, and the metabolic regulation.

CHEM 3037 Physical Chemistry I (3.5,3,1)

Prerequisite: CHEM 1005 Introduction To Chemistry or CHEM 1015 Foundation of Chemistry

Co-requisite: CHEM 2005 General Chemistry

This is a foundation course in modern chemistry which provides students with fundamental concepts of physical chemistry for their further studies in most branches of advanced chemistry. The course provides students with the concepts of chemical thermodynamics and its applications in phase equilibria and solution electrochemistry.

CHEM 3045 Physical Chemistry Laboratory I (1,0,3)

Prerequisite: Chemistry major students

This course provides students with practical experimental knowledge/skills related to the principles acquired from CHEM 3037 Physical Chemistry I.

CHEM 3150 Polymer Chemistry (3,3,0)

Prerequisite: CHEM 1112 Organic Chemistry II and CHEM 2310 Physical Chemistry II, or consent of instructor

This course is designed to introduce topics covering polymerization processes, characterization of polymers and polymer related technology.

CHEM 3160 Chemical Information Search (1,1,0)

Prerequisite: CHEM 1112 Organic Chemistry II, CHEM 1260 Fundamentals of Chemistry, CHEM 2170 Instrumental Analysis and CHEM 2330 Physical Chemistry II

This course is designed to teach all Chemistry majors how to carry out an efficient search for chemical information from a variety of sources, including the primary and secondary chemical literature, the relevant scientific and technological databases and on the Internet. A hands-on workshop teaching approach will be adopted.

CHEM 3170 Environmental Analysis (3,0,3)

Prerequisite: Chemistry major with Year III standing or CHEM 2510 Chemical Analysis

This course deals with the analysis of atmospheric, terrestrial and aquatic pollutants in the environment. An introduction of

environmental quality models and modern monitoring techniques will also be covered.

CHEM 3190 Spectroscopic Techniques for Structure Determination (3,3,0)

Prerequisite: CHEM 1112 Organic Chemistry II and CHEM 2330 Physical Chemistry II, or CHEM 2510 Chemical Analysis

This course covers the basic principles and applications of several major spectroscopic techniques used in the determination of molecular structures. The techniques to be discussed include infrared (IR), Raman, nuclear magnetic resonance (NMR), electron paramagnetic resonance (EPR) spectroscopy and mass spectrometry.

CHEM 3210 Advanced Instrumental Analysis (3,3,0)

Prerequisite: CHEM 2170 Instrumental Analysis or CHEM 2510 Chemical Analysis

Basic principles, methodologies, and instrumentation concerning major analytical techniques, such as mass spectrometry, gas and liquid chromatography, electrochemistry, and atomic spectroscopy will be covered. Emphasis will be placed on the application of these analytical techniques to solving real-world problems, based on case studies borrowed from commercial and government laboratories. Such practical knowledge will be helpful to students in search for employments upon graduation, in which market demand for analytical chemists in Hong Kong/China should remain relatively high in the foreseeable future.

CHEM 3220 Structural Methods in Chemistry (3,3,0)

Prerequisite: CHEM 1112 Organic Chemistry II and CHEM 2330 Physical Chemistry II

This course is aimed to introduce the various physical techniques commonly used in structure determination to students in chemistry. The emphasis will be on the practical applications of these techniques in solving structural problems in chemistry rather than on a detailed discussion of the physical principles behind each technique. The techniques that will be covered include NMR, EPR, mass spectrometry and X-ray crystallography.

CHEM 3430 Pharmaceutical Chemistry (3,3,0)

Prerequisite: BIOL 1160 Biological Chemistry, CHEM 1111-2 Organic Chemistry I & II, CHEM 1510 Chemistry for Life Science or CHEM 2180 Biochemistry

This course provides a systematic study of the various mechanisms of drug action and how effective therapeutic agents are developed.

CHEM 3440 Bioorganic and Natural Products Chemistry (3,3,0)

Prerequisite: BIOL 1160 Biological Chemistry, CHEM 1112 Organic Chemistry II or CHEM 2180 Biochemistry

This course deals with the biosynthesis of natural products of all kinds. The interaction of some natural and synthetic molecules with living systems are to be discussed.

CHEM 3450 Organic Synthesis (3,3,0)

Prerequisite: CHEM 1111-2 Organic Chemistry I & II

This course gives an outline on the basic concepts methodologies of building up an organic molecule. Topics covered include carbon-carbon bonds formation, functional groups transformations and total synthesis of several selected molecules of widely differing types of structure.

CHEM 3460 Organometallic Chemistry (3,3,0)

Prerequisite: CHEM 2190 Inorganic Chemistry

The objective of this course is to provide a concise introduction to organometallic chemistry. Upon completion of the course, the students will have a fundamental understanding of (1) reaction mechanisms, (2) synthesis and reactivities, and (3) industrial applications of organometallic complexes.