

CHEM 2510 Chemical Analysis (3,3,0) (E)
 Prerequisite: A-Level/AS-Level Chemistry or CHEM 1510 Chemistry for Life Science or equivalent chemistry course

This course emphasizes the presentation of the techniques and instrumentation involved in modern chemical analysis. This course is not for Chemistry majors.

CHEM 2520 Chemical Analysis Laboratory (1,0,3) (E)
 Co-requisite: CHEM 2510 Chemical Analysis

This course provides students with the practical experience of applying the techniques studied in Chemical Analysis to the solution of analytical problems. This course is open to Applied Biology and Pharmacy in Chinese Medicine majors only.

CHEM 3005 Instrumental Analysis (3,3,0) (E)

Prerequisite: CHEM 2015 Analytical Chemistry

This course aims to educate students to understand the fundamental knowledge in the basic theory, structure, operating principle of chemical instrumentation which can aid in the analysis of a chemical system effectively.

CHEM 3006 Instrumental Analysis Laboratory (1,0,3) (E)

Prerequisite: CHEM 2015 Analytical Chemistry

Co-requisite: CHEM 3005 Instrumental Analysis

This course aims to allow students to practise the techniques they have learned in the corresponding lecture course in the laboratory.

CHEM 3007 Physical Chemistry II (3.5,3,1) (E)

Prerequisite: CHEM 2017 Physical Chemistry I

This course presents to students the physical concepts in quantum chemistry, chemical kinetics and symmetry, and is an important prerequisite to spectroscopic techniques in structure determination, applied spectroscopy and materials science.

CHEM 3015 Inorganic Chemistry (3,3,0) (E)

Prerequisite: CHEM 1005 Introduction to Chemistry; CHEM 2009 Organic Chemistry II; CHEM 3007 Physical Chemistry II

To provide students with a solid understanding of all the fundamental concepts and physical principles in inorganic chemistry and the relevance of these topics to our daily life. This course also aims at preparing the students for several advanced level courses such as Organometallic Chemistry, Organic Synthesis and Advanced Materials.

CHEM 3016 Inorganic Chemistry Laboratory (1,0,3) (E)

Co-requisite: CHEM 3015 Inorganic Chemistry

This course provides students with practical work related to the principles studied in Inorganic Chemistry.

CHEM 3017 Physical Chemistry Laboratory II (1,0,3) (E)

Prerequisite: Chemistry major students

This course provides students with practical experimental knowledge/skills related to the principles acquired from CHEM 2017 Physical Chemistry I and CHEM 3007 Physical Chemistry II.

CHEM 3025 Chemical Analysis (3,3,0) (E)

Prerequisite: NSS Level or CHEM 2026 Chemistry for Life Sciences or equivalent Chemistry course

This course aims to familiarize students with the principles of analytical chemistry and basic analytical techniques including volumetric, gravimetric and instrumental analysis. This course is not for Chemistry majors.

CHEM 3026 Chemical Analysis Laboratory (1,0,3) (E)

Co-requisite: CHEM 3025 Chemical Analysis

This course provides students with the practical experience of applying the techniques studied in Chemical Analysis to the solution of analytical problems.

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

Prerequisite: CHEM 2017 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 3150 Polymer Chemistry (3,3,0) (E)

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) (E)

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) (E)

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) (E)

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) (E)

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) (E)

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) (E)

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) (E)

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) (E)

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) (E)

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.

CHEM 3480 Advanced Materials (3,3,0) (E)

Prerequisite: Year III standing

This course is to expose students to the study of current and important topics in the selected area of materials chemistry, and to enable students to gain an overview of recent research development of those selected areas.

CHEM 3550 Integrated Chemistry Laboratory (1,0,3) (E)

Prerequisite: Year III standing with CHEM 1112 Organic Chemistry II and CHEM 2310 Physical Chemistry II and/or Advanced Level Chemistry

This course aims to introduce students to application of chemistry principles from Year II and Year III chemistry courses. Industrial chemical analysis, material processing, and separation processes are treated with illustrations chosen from modern industry. The students are required to participate in a plant visit to local/regional chemical industries.

CHEM 3560 Bioanalytical Chemistry (3,3,0) (E)

Prerequisite: CHEM 2170 Instrumental Analysis or CHEM 2510 Chemical Analysis

This course is aimed at students in chemistry, biology and biomedical sciences who are interested in learning the basic principles and instrumental techniques in the analysis of biomolecules, such as proteins and nucleic acids. Topics covered include sample preparation and separation techniques, molecular recognition techniques, nucleic acids amplification and sequencing, protein sequencing and analysis, and applications of mass spectrometry in bioanalysis.

CHEM 3591-2 Final Year Project I & II (3,0,9) (E)

Co-requisite: Year III standing

An individual project which is usually of interdisciplinary or applied courses in the final year, and requires knowledge and skill acquired in the course. A thesis and an oral presentation are required upon completion of the project. This course is open to Chemistry majors only.

CHEM 3610 Dissertation in Chemistry (3,*,*) (E)

Prerequisite: Year III standing

This course provides opportunities for students to be engaged in literature research (i.e. non-laboratory based) in a particular topic in pure or applied chemistry. The students are expected to work, as individuals or in small groups, closely with a member of the teaching staff. The outcome of this research work will be presented orally as well as in the form of a written dissertation for grading at the end of the study period.

CHEM 3910 Special Topics in Chemistry (3,3,0) (E)

Prerequisite: Chemistry major with Year II standing or consent of instructor

This course is devoted to the study of up-to-date and important topics in different areas of chemistry. Emphasis is laid on the continuation and consolidation of those fundamental courses offered in the programme. This course will also take care of those topics that have not been specifically included in programme.

CHEM 4005 Biochemistry (3,3,0) (E)

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 4006 Environmental Chemistry and Pollution Control (3,3,0) (E)

Prerequisite: CHEM 1005 Introduction to Chemistry and Year III or above standing

This course describes the sources, transport, reactivity and sink of contaminants in the environment together with various technology options used for pollution control. The interconnection between air, water, land pollution and human activities will be addressed.

CHEM 4007 Environmental Studies Laboratory (1,0,3) (E)

Prerequisite: CHEM 1005 Introduction to Chemistry and Year III or above standing

This course aim to give students practical experience in the following areas: (1) quantitative determinations of selected environmental pollutants, (2) monitoring of their ecological impacts, and (3) some treatment methods for their removals. Problems of local concern will be emphasized.

CHEM 4015 Integrated Chemistry Laboratory (1,0,3) (E)

Prerequisite: Final year Chemistry students with CHEM 2009 Organic Chemistry II and CHEM 3007 Physical Chemistry II

This course aims to introduce students to the application of chemical principles acquired from final and previous year chemistry related major courses. Chemical manufacturing, material processing, separation process, environmental and food-related topics are treated with illustrations chosen from modern chemical technology. The students are required to participate in a plant visit to local/regional chemical related industries.

CHEM 4016 Dissertation In Chemistry (3,*,*) (E)

Prerequisite: Chemistry major Year IV standing

This course aims to train students to (1) conduct detailed and extensive literature search on current topics in pure and applied chemistry, and (2) organize and present the relevant information gathered from such search in a dissertation format.

CHEM 4017 Environmental Analysis (3,3,0) (E)

Prerequisite: CHEM 3005 Instrumental Analysis or CHEM 3025 Chemical Analysis

This course aims to train students with knowledge of various pollution monitoring techniques, and cause and effect relationships so that they will be able to select the appropriate procedure in the solution of environmental problems.