

stereochemistry, molecular rearrangements, and chemistry of carbonyl compounds, carbanions and natural products is to be preceded by bonding, thermodynamics, chemical kinetics and surface catalysis. This course is offered to Non-Major Students only.

CHEM 1520 Chemistry for Life Science Laboratory (1,0,3)

Prerequisite: A-Level Chemistry or AS-Level Chemistry or consent of instructor

Co-requisite: CHEM 1510 Chemistry for Life Science

Experiments are selected to illustrate the principles discussed in Chemistry for Life Science.

CHEM 1660 Better Living through Chemistry (3,3,0)

This course is designed for those non-science majors who are interested in the underlying chemistry of the many facets in modern living. Topics to be discussed include the chemistry of foods, cooking and wine-making, the chemistry of drugs, health and beauty products, the chemistry of new materials, the design of miniature machines and molecular devices, the chemical tools in crime scene investigations, the molecular evolution of life, the chemistry of textiles and modern fabrics and archaeological chemistry. Live chemical demonstrations, online resources and case studies will be provided when applicable. About 4 to 5 topics from the above list will be discussed each time.

CHEM 2120 Inorganic Chemistry Laboratory (1,0,3)

Co-requisite: CHEM 2190 Inorganic Chemistry

This course provides students with practical work related to the principles studied in Inorganic Chemistry. Experiments are designed for students to gain practical experiences in Inorganic Chemistry after they have studied the lecture course.

CHEM 2170 Instrumental Analysis (3,3,0)

Prerequisite: CHEM 1230 Analytical Chemistry

Co-requisite: CHEM 2250 Integrated Chemistry Tutorials III

Instrumental techniques like spectroscopy, flame emission and atomic absorption, solvent extraction and chromatography will be studied. This course forms the basis for advanced studies in instrumental analysis, environmental studies and industrial studies.

CHEM 2180 Biochemistry (3,3,0)

Prerequisite: CHEM 1112 Organic Chemistry II

This course gives an introduction to the basic concepts of biochemistry. Topics covered include carbohydrates, lipids, proteins, and nucleic acids. Special attention is given to their structures, properties, catabolisms and biosyntheses. Enzymes will also be discussed.

CHEM 2190 Inorganic Chemistry (3,3,0)

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

This course is aimed to provide the students with a solid understanding of all the fundamental concepts and physical principles in modern inorganic chemistry necessary for the study of the more advanced or specialized courses that follow. The topics discussed include coordination chemistry, organometallic chemistry, main group chemistry and their applications in industry and our daily life.

CHEM 2220 Instrumental Analysis Laboratory (1,0,3)

Prerequisite: CHEM 1230 Analytical Chemistry

Co-requisite: CHEM 2170 Instrumental Analysis

Students are required to practise the techniques they have learned in the corresponding lecture course in the laboratory. This course is open to Chemistry majors only.

CHEM 2250 Integrated Chemistry Tutorials III (0,0,1)

An integrated tutorial course supporting the courses CHEM 2170 Instrumental Analysis and CHEM 2330 Physical Chemistry II. Students will engage in small group discussion and find solutions

to assigned problems under the guidance of staff members of the Department of Chemistry.

CHEM 2310 Physical Chemistry II (3.5,3,1)

Prerequisite: CHEM 1330 Physical Chemistry I

Co-requisite: CHEM 2250 Integrated Chemistry Tutorials III

This course continues to present 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 2510 Chemical Analysis (3,3,0)

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.

CHEM 2520 Chemical Analysis Laboratory (1,0,3)

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 3150 Polymer Chemistry (3,3,0)

Prerequisite: CHEM 1112 Organic Chemistry II and CHEM 2330 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 2330 Physical Chemistry II and CHEM 2170 Instrumental Analysis

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 Instrumental Analysis in Modern Laboratories (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.

CHEM 3480 Advanced Materials (3,3,0)
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)
Prerequisite: Year III standing with CHEM 1112 Organic Chemistry II and CHEM 2330 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)
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)
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,*,*)
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)
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 7210 Analytical Process and Applied Statistics (2,2,0)

Prerequisite: Postgraduate standing
The objective of this course is to help the students to develop an analyst's approach to solve chemical analytical problems by equipping them with important basic tools including statistics, sampling and analytical planning, data treatment and interpretation, and experimental design.

CHEM 7220 Chemical Instrumentation (2,2,0)
Prerequisite: Postgraduate standing

Important concepts and developments in chemical instrumentation will be introduced. The student will acquire a better appreciation of the capabilities and limitations of these new tools which will help them make better choices of instruments and methods in real life analytical problems. The material in this course will be updated from time to time to reflect the most recent trend in instrument development.

CHEM 7240 Analytical Spectroscopy (2,2,0)
Prerequisite: Postgraduate standing

This course reviews the basic principles of modern spectroscopy and their applications at an advanced level. Emphasis is laid on the instruments used most commonly in elemental analysis (atomic spectroscopies) on the one hand and those for the analysis of molecular and ionic species in solution (optical spectroscopies) on the other.

CHEM 7250 Laboratory Management (2,2,0)
Prerequisite: Postgraduate standing

The objective of this course is to introduce concepts of quality assurance, issues pertaining to laboratory management, basic principles of experimental design and chemometrics, and methods for efficient management of analytical laboratories.

CHEM 7270 Electroanalytical Chemistry (1,1,0)
Prerequisite: Students of MSc in Analytical Chemistry

This course illustrates the basic principles and applications of modern electroanalytical methods at the advanced level.