CHEM 1005 Introduction to Chemistry (3,3,0) (E)
To provide all science students with some fundamental concepts and principles of chemistry as well as to demonstrate to them the diverse and important applications of chemistry in everyday life.

CHEM 1010 Ocean Voyage—Science in the Sea (3,3,0) (E)
This course is for students who are curious to learn about the ocean and its science, history and more. Students will be introduced the concepts of marine and environmental science, as well as cultural, economic and political impacts to address marine-environmental issues at local and regional scales.

CHEM 1111-2 Organic Chemistry I & II (3,3,0) (E)
Prerequisite: A-Level Chemistry or Foundation of Chemistry
Co-requisite: CHEM 1251 Integrated Chemistry Tutorials I (for CHEM 1111) and CHEM 1252 Integrated Chemistry Tutorials II (for CHEM 1112)
This course provides a mechanistic approach to the studies of organic reactions with special emphasis on stereochemistry, conformation and the use of modern spectroscopic methods in structure determination. It also stresses molecular rearrangement, aromatic chemistry, di- and poly-functional compounds, and the design of multi-step synthesis.

CHEM 1121-2 Organic Chemistry Laboratory I & II (1,0,3)
Prerequisite: A-Level Chemistry (for CHEM 1121) and CHEM 1121 Organic Chemistry Laboratory I (for CHEM 1122)
Co-requisite: CHEM 1111-2 Organic Chemistry I & II
This laboratory course is designed to familiarize the students with the application of organic chemistry. The preparation skills of the students are to be developed by performing different types of organic reactions. This course is open to Chemistry majors only.

CHEM 1220 Analytical Chemistry Laboratory (1,0,3)
Co-requisite: CHEM 1230 Analytical Chemistry
This course provides students with practical experience in applying the techniques studied in Analytical Chemistry and Instrumental Analysis to the solution of analytical problems, including those of a practical nature. This course is open to Chemistry majors only.

CHEM 1230 Analytical Chemistry (3,3,0) (E)
Prerequisite: A-Level Chemistry or consent of instructor
Co-requisite: CHEM 1252 Integrated Chemistry Tutorials II or CHEM 2045 Analytical & Testing Science Tutorials II
The fundamental principles of classical quantitative chemical analysis, gravimetric and volumetric analysis will be introduced, together with the statistical treatment of analytical data.

CHEM 1251 Integrated Chemistry Tutorials I (0,0,1) (E)
An integrated tutorial course supporting the courses CHEM 1260 Fundamentals of Chemistry and CHEM 1111 Organic Chemistry I. 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 1252 Integrated Chemistry Tutorials II (0,0,1) (E)
An integrated tutorial course supporting the courses CHEM 1112 Organic Chemistry II and CHEM 1230 Analytical Chemistry. 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 1260 Fundamentals of Chemistry (3,3,0) (E)
Prerequisite: A-Level Chemistry or Foundation of Chemistry
Co-requisite: CHEM 1251 Integrated Chemistry Tutorials I
This is intended to be the first chemistry programme course for all Chemistry majors. It is aimed to provide the students with a solid understanding of all the fundamental concepts and physical principles in chemistry necessary for the study of the more advanced or specialized programme course that follow. The topics discussed include atomic and molecular structures, chemical bonding, intermolecular forces and states of matter, and acid-base chemistry.

CHEM 1310 Physical Chemistry I (3.5,3,1) (E)
Prerequisite: A-Level Chemistry
Co-requisite: CHEM 1252 Integrated Chemistry Tutorials II
This course provides students with the fundamental concepts of chemical thermodynamics and its application in electrochemistry solution properties, phase equilibria.

CHEM 1320 Physical Chemistry Laboratory I (1,0,3)
Prerequisite: CHEM 1330 Physical Chemistry I
CHEM 2320 Physical Chemistry Laboratory II (1,0,3)
Prerequisite: CHEM 2330 Physical Chemistry II
These courses provide students with practical work related to the principles studied in Physical Chemistry I & II. This course is open to Chemistry majors only.

CHEM 1510 Chemistry for Life Science (3,3,0) (E)
Prerequisite: A-Level Chemistry or AS-Level Chemistry or consent of instructor
This course gives a detailed treatment of topics selected from Organic and Physical Chemistry. The discussion of 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) (E)
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 chemcial 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 1670 Better Living through Technologies and Innovations (3,3,0) (E)
Prerequisite: A-Level Chemistry
Designed as a free elective for science majors, the course aims to demonstrate, through daily life examples, the many important contributions and relevance of chemical sciences and technology to the betterment of humankind.

CHEM 2005 General Chemistry (3,3,0) (E)
Prerequisite: CHEM 1005 Introduction to Chemistry
Co-requisite: CHEM 2006 Integrated Tutorials I
To provide students with a good grasp of the fundamental concepts and basic principles and skills in chemistry necessary for the study of more advanced courses.

CHEM 2006 Integrated Chemistry Tutorials I (0,0,1) (E)
Co-requisite: CHEM 2008 Organic Chemistry I or CHEM 2005 General Chemistry
To enhance in-depth understanding of the lecture materials presented in the courses CHEM 2008 Organic Chemistry I and CHEM 2005 General Chemistry through small group discussion and guided problem solving.

CHEM 2007 Integrated Chemistry Tutorials II (0,0,1) (E)
Co-requisite: CHEM 2009 Organic Chemistry II, CHEM 2015 Analytical Chemistry
To enhance in-depth understanding of the lecture materials presented in the courses CHEM 2009 Organic Chemistry II and CHEM 2015 Analytical Chemistry through small group discussion and guided problem solving.

CHEM 2008-9 Organic Chemistry I and II (3,3,0) (E)
Prerequisite: CHEM 1005 Introduction to Chemistry or CHEM 2026 Chemistry for Life Sciences or with consent of instructors
Co-requisite: CHEM 2006 Integrated Chemistry Tutorials I (for CHEM 2008) and CHEM 2007 Integrated Chemistry Tutorials II (for CHEM 2009)
To introduce students to the fundamentals of the mechanistic approach for organic reactions, to stress structures and syntheses, with special emphasis on stereochemistry, conformation and the use of spectroscopic techniques. This course is not open to Analytical and Testing Sciences major students.

CHEM 2015 Analytical Chemistry (3,3,0) (E)
Prerequisite: CHEM 1005 Introduction to Chemistry
Co-requisite: CHEM 2007 Integrated Chemistry Tutorials II or CHEM 2045 Analytical & Testing Science Tutorials II
This course aims to educate students to understand the concepts of chemical analysis and to apply these fundamental principles to the analysis of environmental, clinical, industrial and other applied chemical systems.

CHEM 2016 Analytical Chemistry Laboratory (1,0,3)
Prerequisite: CHEM 1005 Introduction to Chemistry
Co-requisite: CHEM 2015 Analytical Chemistry
This course aims to educate students to understand the concepts of chemical analysis and to apply these fundamental principles to the analysis of environmental, clinical, industrial and other applied chemical systems.

CHEM 2017 Physical Chemistry I (3.5,3,1) (E)
Prerequisite: CHEM 1005 Introduction To 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 2018-9 Organic Chemistry Laboratory I and II (1,0,3)
Prerequisite: CHEM 1005 Introduction to Chemistry or CHEM 2026 Chemistry for Life Sciences or with consent of instructors (for CHEM 2018) and CHEM 2018 (for CHEM 2019)
Co-requisite: CHEM 2008 Organic Chemistry I (for CHEM 2018) and CHEM 2009 Organic Chemistry II (For CHEM 2019)
To make students familiar with all fundamental purification and separation techniques applicable in organic chemistry. To develop appreciation of the need for practical skill and the importance of performing different types of organic reactions.

CHEM 2025 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 CHEM2017 Physical Chemistry I.

CHEM 2026 Chemistry for Life Sciences (3,3,0) (E)
Prerequisite: NSS Level Chemistry or Combined Science (Chemistry) or CHEM 1005 Introduction to Chemistry or with consent of instructor
This course aims to provide a foundation of Basic Chemistry relevant to the study of Life Sciences. This course is not open to Chemistry or Analytical and Testing Sciences major students.

CHEM 2027 Chemistry for Life Sciences Laboratory (1,0,3)
Co-requisite: CHEM 2026 Chemistry for Life Sciences
This course aims to provide selected experiments on basic and physical chemistry which are relevant to pharmaceutical and biomedical studies and to illustrate basic chemical laboratory techniques. It also aims to provide clear illustrations of the chemical principles of thermodynamics, kinetics, stereochemistry discussed in the lecture course.

CHEM 2035 Better Living through Technologies and Innovations (3,3,0)
Prerequisite: CHEM 1005 Introduction to Chemistry
Designed as a free elective for science majors, the course aims to demonstrate, through daily life examples, the many important contributions and relevance of chemical sciences and technology to the betterment of humankind.

CHEM 2036 Fundamentals of Organic Chemistry (3,3,0) (E)
Prerequisite: CHEM 1005 Introduction to Chemistry
Co-requisite: CHEM 2037 Analytical and Testing Sciences Tutorials I
This course describes functional group and mechanistic approaches in studying the chemistry of organic and biological compounds. Correlation between structures and properties/ activities will be discussed. Important organic reactions will be discussed with special emphasis on stereochemistry, reaction mechanisms and the use of modern spectroscopic methods in structural determination.

CHEM 2037 Analytical and Testing Science Tutorials I (0,0,1) (E)
Co-requisite: CHEM 2036 Fundamentals of Organic Chemistry
This course enhances in-depth understanding of the lecture materials presented in the course CHEM 2036 Fundamentals of Organic Chemistry through small group discussion and guided problem solving.

CHEM 2045 Analytical and Testing Science Tutorials II (0,0,1) (E)
Co-requisite: CHEM 2015 Analytical Chemistry and CHEM 2046 Phyical and Inorganic Chemistry
This course enhances in-depth understanding of the lecture materials presented in the courses CHEM 2046 Physical and Inorganic Chemistry and CHEM 2015 Analytical Chemistry through small group discussion and guided problem solving.

CHEM 2046 Physical and Inorganic Chemistry (3,3,0) (E)
Prerequisite: CHEM 1005 Introduction to Chemistry
Co-requisite: CHEM 2037 Analytical and Testing Science Tutorials I
To provide students with a solid understanding of the fundamental concepts and physical principles in physical and inorganic chemistry. This course also aims at preparing the students for several advanced level courses.

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) (E)
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) (E)
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) (E)
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) (E)
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) (E)
Prerequisite: CHEM 1310 Physical Chemistry I
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) (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)
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)
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)
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)
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)
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)
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)
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)
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)
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)
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)
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) (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)
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)

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)

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)

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,*,*)

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)

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.

CHEM 4025 Advanced Instrumental Analysis (3,3,0)

Prerequisite: CHEM 3005 Instrumental Analysis or CHEM 3025 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 pursuing a career in analytical science.

CHEM 4026 Advanced Materials (3,3,0)

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

This course aims 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 in these selected areas.

CHEM 4027 Bioanalytical Chemistry (3,3,0)

Prerequisite: CHEM 3005 Instrumental Analysis or CHEM 3025 Chemical Analysis

To introduce students to the basic principles and techniques in the analysis of biomolecules.

CHEM 4035 Bioorganic and Natural Products Chemistry (3,3,0)

Prerequisite: BIOL 2005 Biological Chemistry or CHEM 2009 Organic Chemistry II, CHEM 2036 Fundamentals of Organic Chemistry

This course deals with the biosynthesis of several important classes of natural products including polyketides, terpenoids, steroids and alkaloids. The interaction of some natural and synthetic molecules with living systems and the relevance of natural products to the well being of humankind are to be discussed.

CHEM 4036 Fundamentals and Applications of Chemical Processes (3,3,0)

Prerequisite: CHEM 3007 Physical Chemistry II, CHEM 2046 Physical and Inorganic Chemistry or consent from instructor

This course aims to introduce students to the fundamentals of modern chemical industries. Students will learn materials and energy balance, basic kinetics and reactors design, examples in separation technology, and economic consideration of modern chemical industries. Students will come to understand some of the major issues involved in modern industrial chemistry via analysis of their processes.

CHEM 4037 Materials Science: Solid State, Surface Chemistry and Catalysis (3,3,0)

Prerequisite: Chemistry or Physics majors with Year IV standing

This course provides a foundation of solid state and surface chemistry. It deals with the modern surface techniques and the application of surface science to various important industrial fields with particular reference to surface catalysis. The objective is to provide students with exposure to solid state and surface chemistry as well as to familiarize them with some techniques for material characterization and surface analysis.

CHEM 4045 Organic Synthesis (3,3,0)

Prerequisite: CHEM 2008 Organic Chemistry I and CHEM2009 Organic Chemistry II; or with consent of instructor

This course gives an outline on the basic concepts and 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. Recent development on asymmetric synthesis will be addressed.

CHEM 4046 Organometallic Chemistry (3,3,0)

Prerequisite: CHEM 3015 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 mechanism, (2) synthesis and reactivity, and (3) industrial applications of organometallic complexes.

CHEM 4047 Pharmaceutical Chemistry (3,3,0)

Prerequisite: BIOL 2005 Biological Chemistry, CHEM 2008-9 Organic Chemistry I & II; or CHEM 2036 Fundamentals of Organic Chemistry

To provide a systematic study of various mechanisms of drug action and how effective therapeutic agents are developed.

CHEM 4055 Polymer Chemistry (3,3,0)

Prerequisite: CHEM 2009 Organic Chemistry II and CHEM 3007 Physical Chemistry II; or CHEM 2036 Fundamentals of Organic Chemistry and CHEM 2046 Physical and Inorganic Chemistry; or with consent of instructor

This course aims to introduce students to the fundamental principles of polymer materials science. Students will learn the meanings of synthetic polymers, their synthesis, their properties, and their applications to modern technology. Students will come to understand all the current issues involved how polymers are made, characterized and applied.

CHEM 4056 Special Topics in Chemistry (3,3,0)
Prerequisite: Chemistry majors with Year III standing or above or consent of instructor
This course is devoted to the study of those current and important topics in chemistry that are not covered in the core and elective courses within the programme curriculum.

CHEM 4057 Spectroscopic Techniques for Structure Determination (3,3,0)
Prerequisite: CHEM 2009 Organic Chemistry II and CHEM 3007 Physical Chemistry II; or CHEM 2036 Fundamentals of Organic Chemistry and CHEM 2046 Physical and Inorganic Chemistry; or CHEM 3025 Chemical Analysis
To enable students to understand the basic principles of some modern spectroscopic techniques commonly used in chemical structure determination. To apply the spectroscopic techniques learnt in the determination of unknown molecular structures

CHEM 4065 Structural Methods in Chemistry (3,3,0)
Prerequisite: CHEM 2009 Organic Chemistry II and CHEM 3007 Physical Chemistry II; or CHEM 2036 Fundamentals of Organic Chemistry and CHEM 2046 Physical and Inorganic Chemistry
To equip students with a working knowledge of the major structural techniques in chemistry.

CHEM 4066 Dissertation in Environmental Studies (3,*,*)
Prerequisite: Chemistry majors (Year IV standing) in Environmental Studies Concentration
This course trains students to (1) conduct detailed and extensive literature search on current topics in environmental science, and (2) organize and present the relevant information gathered from such search in a dissertation format.

CHEM 4067 Atmospheric Science (3,3,0)
Prerequisite: CHEM 2017 Physical Chemistry I or CHEM 2046 Physical and Inorganic Chemistry or consent of the instructor
This course describes the fundamentals of photochemistry, kinetics, and mechanisms to the most important homogeneous and heterogeneous processes that take place in our natural and polluted atmosphere. Their critical interactions on local, regional and global scales will be addressed as well.

CHEM 4075 Marine Chemistry (3,3,0)
Prerequisite: Any Science majors with Year III standing
This course describes the nature and the chemical process in the marine environment. It aims to provide an in-depth understanding of the interrelationship of chemistry and other marine science disciplines and our daily life. Major ion composition of seawater, inputs to and outputs from the ocean via rivers, the atmosphere and the sea floor, biogeochemical cycles within the oceanic water column and sediments, recent discoveries and development in marine chemistry will be briefly discussed.

CHEM 4076 Chemical Testing Laboratory Management and Accreditation (3,*,*)
Prerequisite: CHEM 3005 Instrumental Analysis or CHEM 3025 Chemical Analysis
The course intends to introduce students the concept of quality management system in chemical and testing laboratories. In particular, concept of ISO 9001 and ISO/IEC 17025 will be emphasized. Through laboratory practice, students will also acquire adequate technical skills in the maintenance and calibration of analytical equipment and instruments.

CHEM 4077 Dissertation in Analytical and Testing Sciences (3,*,*)
Prerequisite: Chemistry majors Year IV standing
To train students to conduct detailed and extensive literature search on current topics in pure and applied chemistry. To train students to organize and present the relevant information gathered from such search in a dissertation format.

CHEM 4085 Food Analysis (3,3,0)
Prerequisite: CHEM 3005 Instrumental Analysis or CHEM 3025 Chemical Analysis
This course addresses the basic principles, procedures, instrumentations, and applications of food analysis. Emphasis will be placed on the chemical, physical, and microbial analysis of the major components and harmful substances in foods.

CHEM 4086 Forensic Analytical Chemistry (3,3,0)
Prerequisite: BIOL 2005 Biological Chemistry or CHEM 2008-9 Organic Chemistry I & II, or CHEM 2036 Fundamentals of Organic Chemistry
To provide students the advanced analytical methods in forensic chemistry for their applications to the analysis of controlled substances and materials with an emphasis on new method development.

CHEM 4878-9 Final Year Project I & II (3,0,9)
Prerequisite: Chemistry majors Year IV standing
To guide students in the development of research methodology appropriate to the practice of chemistry and to give opportunity to students to work on problems that have practical significance.

CHEM 4888-9 Environmental Studies Project I & II (3,*,*)
Prerequisite: Chemistry majors (Year IV standing) in Environmental Studies Concentration
To guide students in the development of research methodology appropriate to the practice of environmental studies and to give opportunity to students to work on problems that have practical significance.

CHEM 4898-9 Final Year Project I & II (3,0,9)
Prerequisite: Chemistry majors Year IV standing
To guide students in the development of research methodology appropriate to the practice of chemistry and to give opportunity to students to work on problems that have practical significance.

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.

CHEM 7280 Surface Analysis (1,1,0)
Prerequisite: Students of MSc in Analytical Chemistry
This course provides a detailed treatment of surface analytical techniques, such as XPS, AES, SEM and EDX. Applications of these techniques in the studies of heterogeneous catalysis, polymer, semiconductor, material corrosion, etc. will be demonstrated to the students.

CHEM 7331-2 Dissertation (3,*,*)
Prerequisite: Students of MSc in Analytical Chemistry
A 15-month (part-time) dissertation on an analytical related topic is to be completed independently by each candidate under the supervision of faculty members in the Department of Chemistry or in conjunction with qualified scientists or experts in industrial, government, or other testing laboratories.

CHEM 7340 Environmental Analysis and Monitoring (1,1,0)
Prerequisite: Students of MSc in Analytical Chemistry
This course provides students with conceptual information, general principles and practical utility of important environmental sampling and analysis techniques most commonly used in environmental research and pollution control.

CHEM 7350 Sample Pretreatment Methods (1,1,0)
Prerequisite: Postgraduate standing
This course introduces the principles and applications of traditional and modern sample pretreatment methods, including Soxhlet extraction, microwave extraction, pressurized liquid extraction, supercritical fluid extraction and solid-phase microextraction. Emphases will be placed on the sample pretreatment of herbal materials and foods.

CHEM 7380 Food Safety Analysis (2,2,0)
Prerequisite: Postgraduate standing
This course addresses the principles and applications of various analytical tools in food safety analysis. Most up-to-date analytical techniques for food safety monitoring with local relevance will be discussed in details.

CHEM 7390 Separation Science (3,3,0)
Prerequisite: Postgraduate standing
This course provides a systematic study of the modern techniques of gas chromatography, high-performance liquid chromatography, ultra-performance liquid chromatography and capillary electrophoresis. Emphasis will be placed on the theory, principle and application of these analytical separation techniques to real-world chemical analysis.

CHEM 7401-2 Seminar I & II (0.5,*,0)
CHEM 7403-4 Seminar III & IV (0.5,*,0)
Prerequisite: Postgraduate standing
Regular seminars will be organized which must be attended by MSc students. Speakers from outside or inside institutions and industries who are experts of a particular field will deliver lectures on the topics of food analysis, drug analysis, and environmental analysis, etc. This will enlighten students on current trends and developments in chemical analysis, in analytical problems of global and local interests.

CHEM 7411-2 Advanced Analytical Laboratory (2,*,*)
Prerequisite: Students of MSc in Analytical Chemistry
These courses aim to provide thorough hands-on experience for students to perform and understand modern analytical instrumentation.

CHEM 7420 Mass Spectrometrics Analysis (1,*,*)
This course aims to provide students with in-depth knowledge on mass spectrometry and its application for environmental analysis, pharmaceutical analysis, bioanalysis and food analysis.

CHEM 7430 Parmaceutical and Traditional Chinese Medicinal Analysis (1,*,*)
This course aims to provide students with in-depth knowledge on selected topics in pharmaceutical and traditional Chinese medicinal analysis.

CHEM 7440 Bioanalysis (1,1,0)
Prerequisite: Postgraduate standing
This course intends to introduce students to methods that are used to analyse compounds of biological importance. Principles of modern bioanalytical techniques that are used to measure biomolecules and techniques that use biological processes for analyte detection will be discussed. Students will gain an overview of current advancements in bioanalysis.

CHEM 7450 Chemosensor and Biosensor (1,1,0)
Prerequisite: Postgraduate standing
Introduction to the field of chemosensor and biosensor, as well as an in-depth and quantitative view of the sensor design and performance analysis. Fundamental application of chemo/biosensor theory will be demonstrated including recognition, transduction, signal acquisition, and post processing/data analysis. Topics are selected to emphasize biomedical, bio-processing, environmental, and food safety application.

CHEM 7460 Forensic Analysis (1,1,0)
Prerequisite: Postgraduate standing
The course intends to introduce students the concept of forensic analysis using various daily-life scenarios. In particular, modern analytical approaches and techniques will be demonstrated in solving these forensic cases. Students will also gain an insight on the latest research trends of forensic science.

CHEM 7470 Food Analysis (3,3,0)
Prerequisite: Postgraduate standing
This course discusses methods for food analysis in relation to the nutrition and safety aspects of food products, which are of increasing importance as industries strive to meet rising consumer expectation and regulatory requirements. This course addresses the principles and applications of various analytical tools in food analysis. Most up-to-date analytical techniques for food monitoring with local relevance will be discussed in detail.

CHEM 7480 Food Microbiology for Chemists (1,1,0)
Prerequisite: Postgraduate standing
For students with minimal microbiology background, this course addresses the principles and applications of various analytical tools in food microbiological safety. Analytical techniques, both conventional and novel, for food microbiological safety monitoring with local relevance will be discussed in detail.

CHEM 7710 Current Topics in Chemistry (3,3,0)
Prerequisite: Research postgraduate student standing
This course is devoted to the study of important current topics in different areas of chemistry. Possible topics included Chemosensors and Biosensors, Advanced Polymer Chemistry, Structure and Chemistry of Nucleic Acids, Mass Spectrometry, Electroanalytical Chemistry, Total Synthesis of Natural Products, Physics and Chemistry in Display Technology.

CHEM 7720 Structural Methods in Chemistry (3,3,0)
Prerequisite: Research postgraduate student standing or consent of instructor
This course is aimed to introduce the various physical techniques commonly used in structure determination to the postgraduate research 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 7730 Analytical Process and Applied Statistics (3,2,0)
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 7740 Chemical Instrumentation (3,2,0)
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 7760 Analytical Spectroscopy (3,2,0)
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 7770 Polymer Chemistry (3,3,0)
Prerequisite: Research postgraduate student standing
This course is designed to introduce topics covering polymerization processes, characterization of polymers and polymer related technology.

CHEM 7780 Bioorganic and Natural Products Chemistry (3,3,0)
Prerequisite: Research postgraduate student standing
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 7790 Organic Synthesis (3,3,0)
Prerequisite: Research postgraduate student standing
This course gives an outline on the basic concepts and 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 7800 Organometallic Chemistry (3,3,0)
Prerequisite: Research postgraduate student standing
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 7810 Advanced Materials (3,3,0)
Prerequisite: Research postgraduate student standing
This course is devoted to the study of important topics in different areas of advanced materials with current research interest.

CHEM 7820 Food Safety Analysis (3,2,0)
Prerequisite: Research postgraduate student standing
This course addresses the principles and applications of various analytical tools in food safety analysis. Most up-to-date analytical techniques for food safety monitoring with local relevance will be discussed in details.

CHI 1110 文學概論 (3,2,1) (C)
Introduction to Literature
本科目通過對文學觀念各層面的基本了解，及對中國文學概論的認識，培養學生欣賞及評價文學的能力。
This course familiarizes students with the basics of literature in general and Chinese literature in particular, aiming to cultivate their capability in analysis of literary works.

CHI 1120 現代漢語語法 (3,2,1) (C)
Modern Chinese Grammar
本科目旨在培養學生運用、分析、說明現代漢語的能力。
This course is designed to enhance students' ability to use, analyse and illustrate modern Chinese.

CHI 1130 中國文字學 (3,2,1) (C)
Chinese Etymology
本科目旨在使學生對於中國文字形體的流變與用法有一定瞭解。
This course familiarizes students with the evolution and use of the Chinese vocabulary and writing system.

CHI 1150 歷代中國詩選 (3,2,1) (P)
Selected Readings in Classical Chinese Poetry
本科目旨在培養學生對中國古典詩歌的興趣、閱讀、欣賞和寫作等的能力，提高學生文學修養，助長個人心智發展。
This course is intended to cultivate students' interest in classical Chinese poetry and enhance their capabilities in reading, analysing, and writing Classical Chinese poetry. Students are thereby trained to achieve a higher goal in literary studies and in intellectual growth.

CHI 1170 讀書指導 (3,2,1) (C)
Study Skills and Research Methodology
本科目旨在使學生掌握中國語言及文學的基本方法，為學生在大學數年的學習、畢業論文寫作、以及日後獨立研究奠下基礎。
This course introduces students to the basic research methods of Chinese language and literature. Students will establish a sound basis for their undergraduate work, Honours Project and future independent studies.

CHI 1180 古代漢語 (3,2,1) (C)
Classical Chinese
本科目旨在提高學生閱讀及運用古代漢語資料之能力。
This course aims at enhancing students' ability to read and make use of materials in classical Chinese.

CHI 1190 崑曲文學及清唱藝術 (3,2,1)
Art of Kunqu
本科目旨在培養學生文藝欣賞能力，提昇藝文素養，及融通文化知識與藝文經驗的能力。
This course aims to acquaint students with the art of *Kunqu* by introducing its fundementals and by providing basic trainings in its performance.

CHI 1210 中國文學與大眾文化 (3,2,1)
Life Style, Chinese Literature, Mass Culture
本科講授中國文學與大眾文化之間的多元關聯，旨在提高學生對具體時代語境下所產生的文化／文學的認識及對各類文化現象的分析能力。
The course is intended to explore the multi-facet relationship between mass culture and literary works. The curriculum aims to (1) cultivate students' awareness of certain literary and cultural phenomena in a historical context, and (2) develop their skills in analysing these phenomena.

CHI 1220/ 英譯中國名著選讀（思想文化） (3,2,1)
CHIL 2045 Classical Chinese Masterpieces in English (Thought and Culture)
The course caters for the needs of both native and non-native Chinese speakers. It serves as a gateway for non-native speakers whose Chinese proficiency has not reached a level adequate for reading the texts in their original language, to cultivate their interest in traditional Chinese culture. For native speakers, the course provides a different kind of training whereby students