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; or 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 (4,*,*)

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: Analytical and Testing Sciences 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.