

**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 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)**

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.

**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) (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.

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

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) (E)**

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) (E)**

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) (E)**

Prerequisite: CHEM 2008 Organic Chemistry I and CHEM 2009 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.