

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) (E)

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) (E)

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) (E)

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) (E)

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) (E)

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) (E)

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) (E)

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) (E)

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) (E)

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,*,*) (E)

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) (E)

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.