HIGHER NITEC IN CHEMICAL TECHNOLOGY

CERTIFICATION

Credits required for certification:

Core Modules	:	47
Life Skills Modules	:	9
Elective Modules	:	4
Total	:	60

COURSE STRUCTURE

Module Title	Credits
CORE MODULES	
Introductory Chemistry	5
Analytical Chemistry	4
Laboratory Techniques and Quality Control	3
Laboratory Mathematics and Data Analysis	8
Sample Handling and Processing	5
Basic Instrumental Analysis	7
Advanced Instrumental Analysis	7
Industry Attachment	8
ELECTIVES (COURSE SPECIFIC)	
Introduction to Microbiology	2
Essentials in Environmental Science	2
Introduction to Cosmetic Science	2
Urban Farming Laboratory Techniques	2
ELECTIVES (GENERAL) AND LIFE SKILLS MODULES	
For details, click here	

Note: The offer of electives is subject to the training schedule of respective ITE Colleges. Students are advised to check with their Class Advisors on the availability of the elective modules they intend to pursue.

MODULE OBJECTIVES

Core Modules

Introductory Chemistry

On completion of the module, students should be able to perform manual titration, as well as identify the common elements of organic molecules, nomenclature used, chemical structure and bonding, common functional groups, and the properties associated with the various functional groups of organic compounds.

Analytical Chemistry

On completion of the module, students should be able to perform analysis using simple equipment to perform pH test, automated titration, physical tests, extractions, gravimetric and particle size analysis.

Laboratory Techniques and Quality Control

On completion of the module, students should be able to prepare stock solution and perform dilution, maintain the quality standards of chemical laboratory, including record-keeping for traceability purposes, calibration of measuring instruments, and application of quality control tools for laboratory applications.

Laboratory Mathematics and Data Analysis

On completion of the module, students should be able to apply the various mathematical principles such as algebra, logarithms and graphs construction for laboratory operations and analysis. They should also be able to collate data and perform basic functions using common software programme.

Sampling Handling and Processing
On completion of the module, students should be able to perform common sample pre-treatment methodologies, as well as sampling activities and processes which comply with industrial standards such as cGMP and GLP.

Basic Instrumental Analysis
On completion of the module, students should be able to perform the various modes of spectroscopy which include ultra-violet and infrared spectrometry, atomic spectrometry, and the applications of inductive-coupled plasma and thermal bench instruments. They will also be taught to troubleshoot and maintain spectroscopic and thermal bench instruments.

Advanced Instrumental Analysis
On completion of the module, students should be able to perform the various modes of chromatography which include High Performance Liquid Chromatography (HPLC), Gas Chromatography (GC), LC-Mass Spectrometry and GC-Mass Spectrometry. They will also be able to troubleshoot and conduct basic routine maintenance for chromatographic instruments.

Industry Attachment
Students are provided with the opportunity to work in a laboratory-based environment to gain hands-on training in the real work environment.

Electives (Course Specific)

Introduction to Microbiology
On completion of the module, students should be able to perform basic microbiological techniques, such as safe-handling, examining and cultivating of microorganisms.

Essentials in Environmental Science
On completion of the module, students should be able to perform tests on air, water and effluent waste in monitoring of environment and pollution in the manufacturing industries.

Introduction to Cosmetic Science
On completion of the module, students should be able to prepare simple cosmetic products using basic formulations as well as to perform stability tests to apply the safety concept of cosmetic evaluations based on international legislations.

Urban Farming Laboratory Techniques
On completion of this module, students should be able to perform quality testing on growth media (water, soil, compost, etc.) for the aquaculture and agriculture industries.

Electives (General) and Life Skills Modules
For details, click here.