Module code	SC-2222		
Module Title	Functional Groups in Organic Chemistry		
Degree/Diploma	Bachelor of Science (Chemistry)		
Type of Module	Major Core		
Modular Credits	4	**Total student Workload**	10 hours/week
		Contact hours	4 hours/week
Prerequisite	None		
Anti-requisite	None		

Aims

The module is designed for students to understand the fundamental principles of important functional groups in Organic Chemistry and to apply the theories, concepts and analytical ability in laboratory work.

Learning Outcomes

On successful completion of this module, a student will be expected to be able to:

Lower order :	40%	- describe the preparation and reactions of the organic functional groups - recognize the different types of organic polymers and describe their synthesis and properties; interpret IR, NMR MS spectra
Middle order :	50%	- perform designated experiments during laboratory sessions - apply theories and concepts learnt in the interpretation of experimental observations and results
Higher order:	10%	- present experimental reports in a clear and concise manner - work independently or collaboratively as a team

Module Contents

-Preparation and Reactions: Alkenes, alkynes and dienes; mechanism and stereochemistry of electrophilic additions. Alkyl halides; mechanisms and stereochemistry of substitution (S_N1, S_N2) and elimination (E1, E2) reactions. Alcohols, aliphatic and aromatic amines, aryl diazonium salts and phenols; mechanisms and properties. Aldehydes and ketones; mechanisms (nucleophilic addition) and properties; Aromatic Chemistry: Electrophilic aromatic substitution, halogenation, nitration, alkylation, acylation, sulphonation and substituent effects.

-Preparation, Reactions and Mechanisms: Organic Polymers; structures, synthesis and properties of selected synthetic organic polymers such as plastics and fibers.

-Infra-red (IR) spectroscopy: Preparation of samples for infrared spectra, assignment and interpretation of IR spectra of hydrocarbons, carbonyls and aromatic compounds.

-Nuclear Magnetic Resonance (NMR) spectroscopy: Spectral interpretation of ^1H NMR spectra of hydrocarbons, carbonyl compounds and aromatic compounds: chemical shift, spin-spin splitting (n+1) rule, coupling constant, intensity of signals and integration.

- Mass spectrometry: Mass spectral behaviour of some common functional groups and interpretation of mass spectra of selected organic compounds; examples of common type of fragmentation.

Assessment	Formative assessment	Tutorial and feedback
	Summative assessment	Examination: 60%
		Coursework: 40% - 3 Practical reports (20%) - 3 written assignments (10%) and 3 class tests (10%)