Module code	SC-3262			
Module Title	Instrumental Methods of Chemical Analysis			
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

Towards the completion of this module, students should be able to understand the theoretical basis and operations of modern instruments used in chemical analysis and apply them in the analysis of real samples.

Learning Outcomes

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

Lower order:	30%	- describe various types of instrumental techniques used in chemistry - understand the theoretical basis of chemical instruments - identify the components and uses of various parts of chemical instruments
Middle order:	60%	- apply the use of instruments in chemical analysis - design experimental methodologies using proper instruments - collect, analyse and manage experimental data using chemical instruments
Higher order:	10%	- to evaluate and statistically analyse the data gathered using various instrumental techniques - interpret the results of chemical analyses - produce scientific reports based on laboratory data - work independently and become an effective team player

Module Contents

- Overview of instrumental analysis and measurements Types of instruments for analysis; Instrumental components; Calibration; Figures of merit; Signal-to-noise enhancement.
- Atomic spectroscopy; Atomic absorption and atomic fluorescence spectroscopy; Atomic emission spectrometry; Inductively coupled plasma optical emission spectroscopy.
- Molecular spectroscopy; UV-Visible absorption spectrometry; Molecular luminescence spectrometry; Infrared spectrometry, Raman spectroscopy; Molecular mass spectrometry.
- Thermal and radiochemical methods; Radiocarbon dating; Radioimmunoassays; Neutron activation; Thermogravimetric method (TG), differential thermal analysis (DTA) and differential scanning calorimetry (DSC).
- Electroanalytical methods ; Potentiometry; Coulometry; Electrogravimetry; Voltammetry.
- Chromatographic methods; Principles of chromatography, plate and rate theories, chromatographs; Gas Chromatography (GC, GC-MS), Liquid Chromatography (HPLC, IC, etc)

Assessment	Formative assessment	Tutorial and feedback
	Summative assessment	Examination: 60%
		Coursework: 40% - 2 written assignments (10%) - 2 class tests (10%) - 4 practical reports (20%)