

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			
<i>On successful completion of this module, a student will be expected to be able to:</i>			
Lower order:	30%	<ul style="list-style-type: none"> - 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%	<ul style="list-style-type: none"> - 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%	<ul style="list-style-type: none"> - 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			
<ul style="list-style-type: none"> - 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% <ul style="list-style-type: none"> - 2 written assignments (10%) - 2 class tests (10%) - 4 practical reports (20%) 	