

Subject Description Form

Subject Code	ABCT4758
Subject Title	ADVANCED ANALYTICAL TECHNIQUES LABORATORY
Credit Value	1
Level	4
Co-requisite	ADVANCED ANALYTICAL TECHNIQUES
Objectives	The aim of this module is to provide students with practical experimentation on the subject Advanced Analytical Techniques. The module introduces to students the operation of instruments and practical applications of topics taught in 'Advanced Analytical Techniques'.
Intended Learning Outcomes	Upon completion of this subject, students will be able to: <ul style="list-style-type: none"> a. integrate the principles learned in classroom into the operation of capillary gas chromatography, mass spectrometry, capillary electrophoresis; b. recognise the operational advantages and limitations of each instruments mentioned; c. optimise instrumental parameters for analysis of real-life samples; d. solve complex structural and analytical problems in chemistry.
Subject Synopsis/ Indicative Syllabus	High performance gas chromatography: the techniques and application of fused silica opentubular capillary (FSOT) columns Analysis of pesticide residue in vegetables by GC/MS Analysis of horse heart myoglobin and sulphonated azo-dyes by HPLC/electrospray mass spectrometry Study of capillary zone electrophoresis Analysis of tryptic digests of proteins by MALDI-MS: peptide mass fingerprinting
Teaching/Learning Methodology	Laboratory manuals will be provided to students. The manual will contain descriptions on the basics and background of the experiments. Stepwise instructions will guide the student through the experiment. The lecturer and teaching assistants will explain and demonstrate the operation of the instruments. To enhance their understanding and to develop their skills to operate the various instruments, the students will be supervised and questioned on the principles of certain important procedural step(s) in carrying out the experiments. Written reports will be required for the students to address some specifically designed questions in the laboratory manual. The report writing is intended also to develop the students' ability in technical and scientific writing.

Assessment Methods in Alignment with Intended Learning Outcomes	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)				
			a	b	c	d	
	1. Lab report	60	√	√	√	√	
	2. Lab performance	20	√	√	√	√	
	3. Test	20	√	√	√	√	
Total	100 %						
	<p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>Students will be assessed by their written reports and performance during the practical sessions which will be carefully monitored by the teaching staffs. Written test will also be given to evaluate the students' knowledge on the operation principles of the various instruments and the merits/limitations of the respective analytical methodologies.</p>						
Student Study Effort Expected	Class contact:						
	▪ Laboratory		18 Hrs				
	Other student study effort:						
	▪ Laboratory Report		12 Hrs.				
	▪ Self Study		6 Hrs.				
	Total student study effort		36 Hrs.				
Reading List and References	<p><u>Essential:</u></p> <p>Principles of Instrumental Analysis (6th ed.) Skoog D. A.; Holler F. J. and Nieman, T. A. Brooks/Cole, 2007.</p> <p><u>Supplementary:</u></p> <p>Chemistry Experiments for Instrumental Methods Sawyer D. T.; Heineman W. R.; Beebe J.M. Wiley, 2008.</p> <p>Principles and Practice of Chromatography Ravindranath B Ellis Horwood, 1989</p>						