

Subject Description Form

Subject Code	ABCT2704
Subject Title	Chemistry Laboratory I
Credit Value	2
Level	2
Pre-requisite	General Laboratory Techniques and Safety
Co-requisite	Analytical Chemistry I
Objectives	The aim of this module is to apply the fundamental principles and techniques introduced in Analytical Chemistry I for practical measurements of samples related to Physical Chemistry with emphasis on thermodynamics and kinetic properties.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. deploy the knowledge learned for exploring the basic principles of thermodynamics, reaction rate equations and theories, properties of ions in solutions, electrochemical reactions and interactions at surfaces through experimentation b. Apply the basic spectrophotometric techniques to conduct experimental measurements as well as to critically evaluate, analyze and interpret experimental results c. function effectively in team work d. integrate methods, skills and techniques for solving related chemistry problems
Subject Synopsis/ Indicative Syllabus	Experiments involved may included 1. Enthalpy of Combustion 2. The Effect of Temperature on Solubility - A Study of van't Hoff's Equation with UV spectrophotometry 3. Homogeneous Catalysis - The Harcourt-Esson Reaction 4. Liquid-Vapour Equilibrium of a Binary Solution with infrared spectrophotometry. 5. Rate Constant and Order of a Chemical Reaction with pH titration 6. Ion selective electrodes
Teaching/Learning Methodology	Experiments will be carried out by students to explore and apply what they learned in lecture sessions. Students work together in teams using basic chemical techniques, operating various instruments, and running software packages to solve problems on topics discussed as well as presenting their experimental results. Report writing is required for individual students to scrutinize their analytical, problem solving, communication, judgement and other skills.

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. Performance	25 %		√	√		
	2. Laboratory Reports	45 %	√	√		√	
	3. Test	30 %	√	√			
Total	100 %						
	<p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>This is a laboratory subject and how the students perform in the laboratory would be an important aspect of assessment. In this course, performance in the laboratory is a mark given by the demonstrators and/or instructors to indicate whether the students prepared well before the laboratory session and his or her ability to conduct the experiments effectively and safely. It is also important for the students to analyze and evaluate experimental data obtained (outcome b). Thus, students are required to submit experiments reports which included a description of the background and procedure, presentation of data and analysis of the data as well as discussion which evaluate the reliability of the data, compare the results obtained from previous measurements or literature values, and discuss possible source of errors and discrepancies.</p>						
Student Study Effort Expected	Class contact:						
	▪ Laboratory		48 Hrs.				
	Other student study effort:						
	▪ Laboratory Preparation (reading manuals and related background materials)		14 Hrs.				
	▪ Writing Laboratory Reports		24 Hrs.				
	Total student study effort		86 Hrs.				
Reading List and References	<ol style="list-style-type: none"> 1. A. M. Halpern, Experimental Physical Chemistry (3rd Ed.) W.H. Freeman, 2006 2. C. W. Garland, J. W. Nibler, D. P. Shoemaker, Experiments in Physical Chemistry, (8th Ed.) McGraw Hill 2009 3. Peter W. Atkins and J. de Paula, Physical Chemistry (9th Ed.) Oxford University Press, 2010 4. Peter W. Atkins and J. de Paula, Elements of Physical Chemistry (7th Ed.) Oxford University Press, 2017 						