

Subject Description Form

Subject Code	ABCT3780
Subject Title	Inorganic Chemistry II Laboratory
Credit Value	2
Level	3
Pre-requisite	Chemistry Laboratory II
Co-requisite	Inorganic Chemistry II
Objectives	To offer the students with hand-on experience in inorganic synthesis, compound characterization with different physical methods, and reactivity study of some inorganic compounds.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: - carry out experimental work in inorganic chemistry independently - acquire the ability to plan multi-step experiments in coordination chemistry - apply the various physical techniques for the characterization of coordination compounds - explain some principles of coordination chemistry through the experimental work
Subject Synopsis/ Indicative Syllabus	<u>Indicative Titles of Experiments</u> - Synthesis and characterization of $[\text{Cr}(\text{acac})_3]$ - Preparation of carbonatotetraaminocobalt(III) nitrate, chloropentaaminocobalt(III) chloride, and nitro- and nitrite-linkage isomers of pentaaminocobalt(III) chloride - Optical isomers of $[\text{Co}(\text{en})_3]^{3+}$ - Synthesis of meso-tetraphenylporphyrin and meso-tetraphenylporphyrinato zinc(II) complex - Oxygen uptake by cobalt(II) complex - Analyzing first order kinetics – <i>cis-trans</i> isomerization of mercury dithizonate
Teaching/Learning Methodology	Since this is the first inorganic chemistry laboratory class for the students, the lecturer and the teaching assistants usually would offer assistance in setting up the apparatus during the first few laboratory sessions. The students are expected to develop the ability to carry out the experimental work with minimal instructions. Each student will be graded based on his/her laboratory reports plus his/her laboratory performance, which will be judged by the lecturer and the teaching assistants. Laboratory safety is always an important component in the laboratory class. A majority of the experiments involves synthesis of well-defined inorganic compounds, followed by studying their physical

	and chemical properties using a variety of physical techniques. The students are expected to plan their work before attending the practical classes and review the physical principles and uncertainties underlying any physical measurements.							
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	b2	c	d		
	1. Laboratory reports	60	√	√	√	√		
	2. Laboratory performance	40	√	√	√	√		
	Total	100 %						
	Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes: The practical classes demand students to demonstrate practical competence in performing inorganic reactions safely and in an organized manner. The students will undertake multi-step chemical synthesis, and that it demands student's team work and time management skills. Their skills will be assessed by their class performance and their performance in in-lab discussion. The written skills and report presentation will be assessed by laboratory reports. Their reports should demonstrate their ability to perform standard physical / instrumental analysis of coordination compounds.							
Student Study Effort Expected	Class contact:							
	▪ Laboratory class (4 hrs per session X 12 weeks)				48 Hrs.			
	Other student study effort:							
	▪ Pre-laboratory works				12 Hrs.			
	▪ Report preparation				30 Hrs.			
	Total student study effort				90 Hrs.			
Reading List and References	1. Huheey, J. E., Keiter, E. A, and Keiter R. L., <i>Inorganic Chemistry, Principle of Structure and Reactivity</i>, 4th ed. Harper Collins, 1993 2. Housecroft, C. <i>Inorganic Chemistry</i>, 4th ed. Pearson, 2012							