Subject Description Form

Subject Code	ABCT4745
Subject Title	Organometallic Chemistry & Catalysis
Credit Value	3
Level	4
Pre-requisite	Inorganic Chemistry II
Co-requisite	nil
Exclusion	nil
Objectives	This module aims at providing the students with the various aspects of organometallic chemistry, ranging from basic concepts and fundamental knowledge to application to catalysis.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. gain an understanding of some important aspects of organometallic chemistry b. recognize that organometallic chemistry lies at the interface between classical organic and inorganic chemistry, but the organometallic molecules are strikingly different from those encountered in classical organic and inorganic chemistry c. realize the significance of organometallic chemistry - it provides powerful synthesis methods in organic chemistry; many commercially important processes for the production of "commodity chemicals" and high value "fine chemicals" such as pharmaceuticals, perfume, agricultural chemicals, and food additives rely on organometallic complexes as catalysts or promoters d. further develop their logical and critical thinking through the discussions and suggestions of possible reaction mechanisms e. gain awareness of the public concern for the environments and realize the importance of carrying out chemical processes in a "green manner"
Subject Synopsis/ Indicative Syllabus	General properties of organometallic complexes. Common ligands in organometallic chemistry and ligand substitution reactions. Some basic reactions in organometallic chemistry: oxidative addition and reductive elimination, insertion and deinsertion, nucleophilic and electrophilic addition and abstraction. Applications to catalysis and organic synthesis.
Teaching/Learning Methodology	Lectures will provide general outlines of the key concepts of the subject. Students are expected to read and understand the contents of the text book after the lectures, which will not cover all the details in the text. Substantial amount of materials will be taken from the literature as supplements to the text. Students are encourage to solve the problem sets (8 or 9); usually a problem set is provided right after the teaching of a topic, a student should be able to gain a better understanding of the contents of the topic by solving the problems. The students will be graded based upon their performance in two 3-hour tests and a 3-hour final examination.

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	e	
1. Examination	70	√	√	√	√	√	
2. Tests	30	√	√	√	√	√	
Total	100 %						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The examination and tests would truly reflect how much the students have learned in the subject. Students are encouraged to solve problem sets; the sets are, however, not graded and therefore not counted toward the student's overall subject results because problem set grade tends to have leveling effect on the overall grade.

Student Study Effort Expected

Class contact:	
▪ Lectures	26 Hrs
▪ Tutorial	13 Hrs.
Other student study effort:	
▪ Self study and solving problem sets	52 Hrs.
Total student study effort	91 Hrs.

Reading List and References

Essential

Crabtree, R. H., The Organometallic Chemistry of the Transition Metals, 4th ed., 2005, Wiley

References

Spessard, G. O., Miessler, G. L., Organometallic Chemistry, 1997 Prentice-Hall