Module code	SC-2212			
Module Title	Transition Metal Chemistry			
Degree/Diploma	Bachelor of Science (Chemistry)			
Type of Module	Major Core			
Modular Credits	4	**Total student Workload**	8	hours/week
		Contact hours	4	hours/week
Prerequisite	None			
Anti-requisite	None			

Aims

The module is designed for students to understand the chemistry of *d-block* or transition metal complexes such as the spectral and magnetic properties of *d-block* elements in terms of Crystal Field theory and Molecular Orbital theory. Laboratory skills including synthesis of metal complexes and hands-on instrumentation will be learnt in practical classes. All experiments are designed so as to encourage students to understand, apply and relate the theories provided in this module.

Learning Outcomes

On successful completion of this module, a student will be expected to be able to:

Lower order :	30%	- understand the bonding, electronic structure and electronic spectra of transition metal complexes - understand the trends in the physical, chemical and magnetic properties of *d-block* elements
Middle order :	60%	- apply IUPAC rule on all *d-block* metal complexes; - explain the spectral and magnetic properties of *d-block* elements in terms of the Crystal Field theory and Molecular Orbital theory - display a strong understanding on the structural diversity on the *d-block* elements
Higher order:	10%	- apply the theory and concepts in practical experiments and research. - work effectively in diverse team in both classroom and laboratory

Module Contents

- nomenclature of transition metal complexes; International Union of Pure and Applied Chemistry (IUPAC) names; stereochemistry of transition metal complexes
- Crystal Field Theory and Molecular orbital theory: Electrostatic model of ligand-metal bonding; ligand-field theory; ligand-field splitting parameter and its correlation with the spectroscopic and magnetic properties of *d-block* transition metal complexes, construction of molecular orbital diagrams for transition metal complexes; stereochemistry of transition metal complexes
- electronic spectra of complexes, interpretation of energies and intensities of electronic transitions
- Racah parameter, Tanabe-Sugano diagrams; general properties of transition metal complexes; Latimer diagram; Ebsworth diagram

Assessment	Formative assessment	Tutorial and feedback
	Summative assessment	Examination: 60%
		Coursework: 40% - 3 practical reports (20%) - 2 class tests (20%)