

Module code	SC-3323		
Module Title	Organic Synthesis and Design		
Degree/Diploma	Bachelor of Science (Chemistry)		
Type of Module	Major Option		
Modular Credits	4	Total student Workload	10 hours/week
		Contact hours	4 hours/week
Prerequisite	None		
Anti-requisite	None		
Aims			
<p>The module is designed for students to gain a sound knowledge on carbonyl chemistry, carboxylic acids and its derivatives, C–C bond formation, protecting groups, basic strategies of retrosyntheses and selective oxidation and reduction of organic compounds and also to apply the theories, concepts and analytical ability in laboratory work.</p>			
Learning Outcomes			
<i>On successful completion of this module, a student will be expected to be able to:</i>			
Lower order:	40%	<ul style="list-style-type: none"> - describe the preparation and reactions of carbonyl compounds, carboxylic acids and its derivatives and their properties - describe C–C bond formation, protecting groups, know basic strategies of retrosyntheses and selective oxidation and reduction of organic compounds - interpret IR, NMR MS spectra 	
Middle order:	50%	<ul style="list-style-type: none"> - perform designated experiments during laboratory sessions - apply theories and concepts learnt in the interpretation of experimental observations and results 	
Higher order:	10%	<ul style="list-style-type: none"> - present experimental reports in a clear and concise manner - work independently or collaboratively as a team 	
Module Contents			
<ul style="list-style-type: none"> - Preparation and reactions of carboxylic acids and its derivatives; mechanisms of nucleophilic acyl substitution, carbonyl alpha-substitution reactions and carbonyl condensation reactions. - The principles and strategies of C–C bond formation in organic synthesis; the use of protecting groups; selective reduction and oxidation of organic compounds; strategies of retrosynthesis of organic compounds using inter-conversion, disconnection and synthons. - Determination of structures of organic compounds using mass spectrometry; infrared, ^1H and ^{13}C NMR spectroscopy. 			
Assessment	Formative assessment	Tutorial and feedback	
	Summative assessment	Examination: 60%	
		Coursework: 40% <ul style="list-style-type: none"> - 3 practical reports (20%) - 3 written assignments - 3 class tests (20%) 	