

SC-4325

MODULE DETAILS	
Module Code:	SC-4325
Module Title:	Reactive intermediates in Organic Syntheses
Module Level:	4 (Undergraduate)
Degree/Diploma:	Bachelor of Science (Chemistry)
Type of Module:	Major Option
Modular Credits:	2
Prerequisite:	None
Anti-requisite:	None
Module Delivery	
Mode of Delivery:	Lectures 2 x per week, plus tutorials
Semester Offered:	August
Time Commitment:	The total expected student workload is 5 h a week. Contact hours are 2 hr per week. Total time commitment per semester is 70 h.
Module Synopsis:	
Programme Leader:	Chemical Sciences
Contact:	Chemical Sciences Faculty of Science Universiti Brunei Darussalam, Jalan Tungku Link Gadong, BE1410 Tel: +673 2 463001 ext 1313 Fax: +673 2 461502 Email: office.fos@ubd.edu.bn Website: fos.ubd.edu.bn

MODULE AIMS, TEACHING METHODS, ASSESSMENT AND SUPPORT		
Aims:	The module is designed for the students to gain knowledge on selected reactive intermediates in organic synthesis, free radicals and learn the basic concepts of organic photochemistry.	
Learning Outcomes:	<i>On successful completion of this module, a student will be expected to be able to:</i>	
	Knowledge and Understanding	
	<table border="1" style="width: 100%;"> <tr> <td style="width: 30%;">Lower order: (40%)</td> <td>- gain knowledge on the formation, reactivity and stability of free radicals and know the basic concepts of organic photochemistry and mechanism reactions involved</td> </tr> </table>	Lower order: (40%)
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Application and Analysis		

	Middle order: (40%)	- to be able to explain the structure, bonding, generation and reactivity of carbenes and nitrenes, intra- and intermolecular addition reaction of carbenes to double bonds
Evaluation & Synthesis, Competence, Communication, and Values & Attitude		
	Higher order: (20%)	- work independently and collaboratively in a team
Module Content:	<p>- Radicals: General principles of free radical chain reactions; reactivity and stability of free radicals; the use of free radicals in carbon-carbon bond formation; introduction to the various radical initiators.</p> <p>-Carbenes: Formation of singlet and triplet carbenes as well as nitrenes and their addition to carbon carbon double bonds; mechanisms of 1,4- and 1,6-addition reactions; stereochemistry of addition of carbene and nitrene to double bonds; reactivity in addition reactions; insertion reaction and rearrangement.</p> <p>-Photochemistry: Consequences of absorption of light by molecules, principles and reactions of carbon-carbon double bonds; diazo compounds and azides; the photochemistry of carbonyl compounds will also be discussed including Norrish Type-I, Norrish Type, Norrish Type-II processes, hydrogen abstraction and the Paterno-Büchi reaction.</p>	
Teaching methods		
Details of teaching and learning activities:	Lectures and tutorials will be delivered in lecture rooms; class discussions to take place within or at the end of lessons; Drawing of "mechanisms of a reaction" and discussions on the whiteboard during tutorials	
	Allocation of Teaching and Learning Activities	
	Tutorials:	One hour per week
	Laboratory/ Practicals:	N/A
	Fieldtrips:	N/A
Assessment tasks		
Details and type of assessments on this module:	Formative assessment	Tutorial and feedback
	Summative assessment	Examination: 60% Types of assessment employed: <ul style="list-style-type: none"> ▪ Written examination paper: 4 questions from choice of 6 questions; ▪ Questions for the written exams: short-answer questions, definitions/drawing our mechanism/predict structure;
		Coursework: 40% - 1 written assignment (10%) - 1 oral presentation (10%) - 2 class tests (20%)
Support and additional information		

Learning Support (References):	Essential/Further reading: 1. Organic Chemistry by Clayden, Greeves, Warren and Wothers, Second edition, 2012, Oxford University Press. 2. Photochemistry and Pericyclic Reactions, Jagdamba Singh and Jaya Singh, Revised 2nd Edition, New Age International Publishers
Breadth Options:	Not a breadth option
Notes:	
Attendance Policy/Requirement:	Students are expected to attend all taught sessions throughout the module including tutorial discussions