

University of the West of Scotland

Module Descriptor

Session: 2024/25

Title of Module: Organic Chemistry 2			
Code: CHEM08002	SCQF Level: 8 (Scottish Credit and Qualifications Framework)	Credit Points: 20	ECTS: 10 (European Credit Transfer Scheme)
School:	School of Computing, Engineering and Physical Sciences		
Module Co-ordinator:	Callum McHugh		
Summary of Module			
<p>The module presents a review of the reactions of alkanes, alkenes, alkynes, etc focusing on their use in synthesis, the notion of functional group interconversion. Additionally, the chemistry of carbonyl compounds - general reactions, nucleophilic addition, nucleophilic acyl substitution, alpha substitution and carbonyl condensation reactions including imines, hemiacetals, and acetals. Oxidation and reduction of alcohols and carbonyls. Reactions primary, secondary and tertiary alkyl halides including SN1 and SN2 and E1 and E2 mechanisms.</p> <p>Aromatic compounds - review structure and electrophilic substitution; extend to substituent effects on the rate and orientation. Consideration of approaches to the synthesis of common substituted benzenes, Effect of substituent groups on the basicity and acidity of aromatic amines, phenols, and carboxylic acids. Applications of aromatic compounds in medicine, colour chemistry and explosives</p> <p>An introduction to stereochemistry will be presented to include – enantiomerism (optical isomerism) of compounds with up to 2 different chiral centres. Rectus (R) and sinister (S) nomenclature. Diastereoisomerism including cis-trans isomerism. Zusammen (Z) and Entgegen (E) nomenclature. Boat and Chair conformations of cyclohexane derivatives, Newmann Projections.</p> <p>The basic principles of IR and NMR spectroscopy and their use in the interpretation of the spectra of simple aliphatic and aromatic molecules will be covered.</p> <p>This module will work to develop several of the key 'I am UWS' Graduate Attributes. Those who complete this module will have developed competencies in report writing, working to deadlines, and developing academic knowledge.</p>			

Module Delivery Method					
Face-To-Face	Blended	Fully Online	HybridC	Hybrid 0	Work-Based Learning
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
See Guidance Note for details.					

Campus(es) for Module Delivery						
The module will normally be offered on the following campuses / or by Distance/Online Learning: (Provided viable student numbers permit) (tick as appropriate)						
Paisley:	Ayr:	Dumfries:	Lanarkshire:	London:	Distance/Online Learning:	Other:
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Add name

Term(s) for Module Delivery					
(Provided viable student numbers permit).					
Term 1	<input checked="" type="checkbox"/>	Term 2	<input type="checkbox"/>	Term 3	<input type="checkbox"/>

Learning Outcomes: (maximum of 5 statements) These should take cognisance of the SCQF level descriptors and be at the appropriate level for the module. At the end of this module the student will be able to:	
L1	Display a knowledge of aliphatic and aromatic functional group chemistry, and of IR and NMR spectroscopy
L2	Display an understanding of the important concepts in organic stereochemistry and be able to interpret the various ways molecules are drawn.
L3	Acquire and develop manipulative skills in the synthesis of aliphatic and aromatic compounds and interpretation of related spectro-analytical data.
Employability Skills and Personal Development Planning (PDP) Skills	
SCQF Headings	During completion of this module, there will be an opportunity to achieve core skills in:
Knowledge and Understanding (K and U)	<p>SCQF Level 8</p> <p>A broad and detailed knowledge of the fundamental reaction chemistry of a variety of the more common functional groups and of aromatics. Knowledge of basic stereochemistry.</p>

Practice: Applied Knowledge and Understanding	SCQF Level 8 Apply knowledge of the chemical reactions associated with common functional groups to devise synthesis of target molecules by functional group interconversion and chain extension.	
Generic Cognitive skills	SCQF Level 8 Students shall have the opportunity to discuss and debate the role and practice of an organic chemist in developing synthetic pathways and in structural elucidation of organic compounds.	
Communication, ICT and Numeracy Skills	SCQF Level 8 Sourcing and collating information using information retrieval and appropriate IT skills to support and enhance assignments and laboratory practicals. Using appropriate numerical skills to evaluate yields of organic reactions undertaken in laboratory exercises.	
Autonomy, Accountability and Working with others	SCQF Level 8 Working effectively with others in laboratory environment and identifying and addressing individual/personal learning needs in the subject area associated with the module	
Pre-requisites:	Before undertaking this module, the student should have undertaken the following:	
	Module Code: CHEM07011	Module Title: Chemistry and Reactions
	Other:	Or equivalent
Co-requisites	Module Code:	Module Title:

*Indicates that module descriptor is not published.

Learning and Teaching
<p>In line with current learning and teaching principles, a 20-credit module includes 200 learning hours, normally including a minimum of 36 contact hours and maximum of 48 contact hours.</p> <p>The lecture programme covers an introduction to the important topics in organic chemistry of aliphatic and aromatic chemistry and carbonyl chemistry. Stereochemistry and spectroscopy are also covered. There is a full workshop programme with regular short tests.</p> <p>The laboratory programme focuses on organic synthesis using common reactions, purifications and characterisation procedures.</p>

Learning Activities	Student Learning Hours (Normally totalling 200 hours): (Note: Learning hours include both contact hours and hours spent on other learning activities)
Lecture/Core Content Delivery	12
Tutorial/Synchronous Support Activity	12
Laboratory/Practical Demonstration/Workshop	24
Independent Study	152
	200 Hours Total
**Indicative Resources: (eg. Core text, journals, internet access)	
<p>The following materials form essential underpinning for the module content and ultimately for the learning outcomes:</p> <p>Organic Chemistry, David R. Klein 3rd Ed, Wiley, (2017) ISBN: 978-1-119-31615-2</p> <p>Beginning Organic Chemistry 2, Graham L Patrick, Oxford University Press (1997) ISBN 0 19 855936 4</p> <p>Organic Chemistry, John McMurry, Brooks-Cole, 9th Edition 2015 ISBN-13: 978-1305080485</p>	
<p>(**N.B. Although reading lists should include current publications, students are advised (particularly for material marked with an asterisk*) to wait until the start of session for confirmation of the most up-to-date material)</p>	
Attendance and Engagement Requirements	
<p>In line with the Student Attendance and Engagement Procedure: Students are academically engaged if they are regularly attending and participating in timetabled on-campus and online teaching sessions, asynchronous online learning activities, course-related learning resources, and complete assessments and submit these on time.</p> <p>For the purposes of this module, academic engagement equates to the following:</p> <p>Attendance of all on-campus sessions (classes and laboratories), and submission of assessments.</p>	

Equality and Diversity

The University's Equality, Diversity and Human Rights Procedure can be accessed at the following link: [UWS Equality, Diversity and Human Rights Code](#).

This module is suitable for any student with appropriate chemistry background, however it should be noted that in order for you to complete this module the laboratory element of coursework will require to be undertaken, disability support can be provided where necessary, consequently, if disability support is needed to complete this part of the module, then the University's Health and Safety Officer should be consulted to make sure that safety in the laboratory is not compromised.

(N.B. Every effort will be made by the University to accommodate any equality and diversity issues brought to the attention of the School)

Supplemental Information

Divisional Programme Board	Physical Sciences
Assessment Results (Pass/Fail)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
School Assessment Board	Physical Sciences
Moderator	Mostafa Rateb
External Examiner	M. Symes
Accreditation Details	This module is accredited by the Royal Society of Chemistry (RSC) as part of the BSc (Hons) Chemistry programme.
Changes/Version Number	2.20 Module Delivery: From Hybrid-C to Face-to-Face Assessment: Change from "unseen open book" to "unseen class test" Assessment Outcome Grid: Components updated

Assessment: (also refer to Assessment Outcomes Grids below)

Assessment 1: Unseen class test (50 %)

Assessment 2: Coursework and lab work – (50%)

(N.B. (i) **Assessment Outcomes Grids** for the module (one for each component) can be found below which clearly demonstrate how the learning outcomes of the module will be assessed.

(ii) An **indicative schedule** listing approximate times within the academic calendar when assessment is likely to feature will be provided within the Student Module Handbook.)

Assessment Outcome Grids (See Guidance Note)

Component 1					
Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Learning Outcome (3)	Weighting (%) of Assessment Element	Timetabled Contact Hours
Unseen class test	✓	✓		50	2

Component 2					
Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Learning Outcome (3)	Weighting (%) of Assessment Element	Timetabled Contact Hours
Class test (written)	✓	✓		10	0
Laboratory/ Clinical/Field notebook	✓	✓	✓	40	0
Combined Total for All Components				100%	2 hours