Module Descriptor

Title	Organic Chemistry 2		
Session	2025/26	**Status**	Published
Code	CHEM08002	**SCQF Level**	8
Credit Points	20	**ECTS (European Credit Transfer Scheme)**	10
School	**Computing, Engineering and Physical Sciences**		
Module Co-ordinator	Callum McHugh		

Summary of Module

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.

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

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.

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.

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.

Module Delivery Method	On-Campus[1] ☒	Hybrid[2] ☐	Online[3] ☐	Work -Based Learning[4] ☐
Campuses for Module Delivery	☐ Ayr ☐ Dumfries	☐ Lanarkshire ☐ London ☒ Paisley	☐ Online / Distance Learning ☐ Other (specify)	

Terms for Module Delivery	Term 1	☒	Term 2	☐	Term 3	☐
Long-thin Delivery over more than one Term	Term 1 – Term 2	☐	Term 2 – Term 3	☐	Term 3 – Term 1	☐

Learning Outcomes	
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
L4	
L5	

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)	**SCQF 8** 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
Practice: Applied Knowledge and Understanding	**SCQF 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 8**

[1] Where contact hours are synchronous/ live and take place fully on campus. Campus-based learning is focused on providing an interactive learning experience supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus contact hours will be clearly articulated to students.

[2] The module includes a combination of synchronous/ live on-campus and online learning events. These will be supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus and online contact hours will be clearly articulated to students.

[3] Where all learning is solely delivered by web-based or internet-based technologies and the participants can engage in all learning activities through these means. All required contact hours will be clearly articulated to students.

[4] Learning activities where the main location for the learning experience is in the workplace. All required contact hours, whether online or on campus, will be clearly articulated to students

	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 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 8** Working effectively with others in laboratory environment and identifying and addressing individual/personal learning needs in the subject area associated with the module

Prerequisites	**Module Code** CHEM07011	**Module Title** Chemistry and Reactions
	Other Or equivalent	
Co-requisites	**Module Code**	**Module Title**

Learning and Teaching

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.

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.

The laboratory programme focuses on organic synthesis using common reactions, purifications and characterisation procedures

Learning Activities During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:	**Student Learning 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
Please select	
Please select	
TOTAL	200

Indicative Resources

The following materials form essential underpinning for the module content and ultimately for the learning outcomes: Organic Chemistry, David R. Klein 3rd Ed, Wiley, (2017) ISBN: 978-1-119-31615-2 Beginning Organic Chemistry 2, Graham L Patrick, Oxford University Press (1997) ISBN 0 19 855936 4 Organic Chemistry, John McMurry, Brooks-Cole, 9th Edition 2015 ISBN-13: 978-1305080485
(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)

Attendance and Engagement Requirements
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. **For the purposes of this module, academic engagement equates to the following:** The School of Computing, Engineering and Physical Sciences considers attendance and engagement to mean a commitment to attending, and engaging in, timetabled sessions. You will scan your attendance via the scanners each time you are on-campus and you will login to the VLE several times per week. Where you are unable to attend a timetabled learning session due to illness or other circumstance, you should notify the Programme Leader that you cannot attend. Across the School an 80% attendance threshold is set. If you fall below this, you will be referred to the Student Success Team to see how we can best support your studies.

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. Aligned with the University's commitment to equality and diversity, this module supports equality of opportunity for students from all backgrounds and learning needs. Using the VLE, material will be presented electronically in formats that allow flexible access and manipulation of content. This module complies with University regulations and guidance on inclusive learning and teaching practice. This module has lab-based teaching and as such you are advised to speak to the Module Co-ordinator to ensure that specialist assistive equipment, support provision and adjustment to assessment practice can be put in place, in accordance with the University's policies and regulations.
(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	**Engineering Physical Sciences**
Overall Assessment Results	☐ **Pass / Fail** ☒ **Graded**
Module Eligible for Compensation	☐ **Yes** ☒ **No** **If this module is eligible for compensation, there may be cases where compensation is not permitted due to programme accreditation requirements. Please check the associated programme specification for details.**

School Assessment Board	Physical Sciences
Moderator	Mostafa Rateb
External Examiner	Dr G. Patrick
Accreditation Details	This module is accredited by the Royal Society of Chemistry (RSC) as part of the BSc (Hons) Chemistry programme and the Chartered Society of Forensic Sciences (CSFS) as part of the BSc (Hons) Forensic Science programme
Module Appears in CPD catalogue	☐ **Yes** ☒ **No**
Changes / Version Number	2.21 Attendance and Engagement statements updated External Examiner updated Accreditation statement updated Equality statement updated

Assessment (also refer to Assessment Outcomes Grids below)
Assessment 1
Unseen class test (50 %)
Assessment 2
Coursework and lab work (50%)
Assessment 3
(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.)

Component 1							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
Unseen class test	☒	☒	☐	☐	☐	50	2

Component 2							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
Class test (written) Laboratory/Clinical/Field notebook	☒	☒	☒	☐	☐	50	0

Component 3

Assessment Type	LO1	LO2	LO3	LO4	LO5	Weighting of Assessment Element (%)	Timetabled Contact Hours
	☐	☐	☐	☐	☐		
Combined total for all components						100%	2 hours

Change Control

What	When	Who
Attendance and engagement statements updated	March 2025	C. McHugh
External Examiner updated	March 2025	C. McHugh
Accreditation statement updated	March 2025	C. McHugh
Equality statement updated	March 2025	C. McHugh