Module Descriptor

Title	Organic Chemistry 4		
Session	2025/26	**Status**	Published
Code	CHEM10003	**SCQF Level**	10
Credit Points	20	**ECTS (European Credit Transfer Scheme)**	10
School	**Computing, Engineering and Physical Sciences**		
Module Co-ordinator	Callum McHugh		

Summary of Module

Lectures in this module will cover advanced or new methods of organic synthetic chemistry, as well as synthetic design. Topics will include aspects of retrosynthesis, asymmetric synthesis, pericyclic reactions, and modern reagents used in organic synthesis.

The principles of 2-D 1H NMR and 13C NMR will be introduced through problem solving 'dry lab' exercises supplemented with a self-learning text. Formal assessment will be set on this element of the course.

Students will be introduced to Spartan molecular modelling software and will complete exercises related to the Diels Alder reaction.

The graduate attributes relevant to this module are given below:

- Academic: Critical thinker, analytical, enquiring, knowledgeable, digitally literate, problem solver, autonomous, incisive, innovative
- Personal: Effective communicator, influential, motivated, team player
- Professional: Collaborative, research-minded, enterprising, ambitious, driven

Module Delivery Method	**On-Campus[1]**	**Hybrid[2]**	**Online[3]**	**Work -Based Learning[4]**
	☒	☐	☐	☐

Campuses for Module Delivery	☐ Ayr ☐ Dumfries	☐ Lanarkshire ☐ London	☐ Online / Distance Learning

[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

			☒ Paisley		☐ 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	Identify and demonstrate a critical understanding of major specialised synthetic pathways in organic chemistry, involving functional group interconversions and carbon-carbon and carbon-heteroatom bond formation
L2	Display detailed knowledge and skills in important areas at the forefront of organic chemistry associated with the fine chemicals industry
L3	Interpret 2-D 1H and 13C NMR spectra
L4	Show competence with the use of molecular modelling software in tackling defined modelling exercises
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 10** Demonstrate a detailed knowledge and understanding of a variety of functional group chemistries and synthetic strategies
Practice: Applied Knowledge and Understanding	**SCQF 10** Apply knowledge of the specialized chemistries to devise synthetic pathways to target molecules relevant to fine chemicals industry. Carry out a series of preparative exercises to understand the use of Spartan molecular modelling software and apply that knowledge to completing set molecular modelling exercises
Generic Cognitive skills	**SCQF 10** Critically evaluate, review, and analyse potential synthetic routes to target organic molecules
Communication, ICT and Numeracy Skills	**SCQF 10** Be able to source, evaluate and collate information using information retrieval and appropriate IT skills to support and enhance assignments and other exercises. Use appropriate numerical and analytical skills in structural elucidation and spectroscopic interpretation
Autonomy, Accountability and Working with Others	**SCQF 10** Work effectively with others in group exercises and in identifying and addressing individual/personal learning needs in the subject area associated with the module. Exercise autonomy and initiative in practical and problem-based learning

Prerequisites	**Module Code** CHEM09004	**Module Title** Organic Chemistry 3
	Other Or suitable appropriate background	
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. This module covers a wide variety of theoretical, conceptual, and practical areas, which require a range of knowledge and skills at a more advanced level to be displayed and exercised. Delivery of its syllabus content therefore involves a diversity of teaching and assessment methods suitable to the learning outcomes of the module; these include formal lectures, structured tutorials (work closely integrated with the lecture material), laboratory exercises to develop practical skills and familiarisation with equipment and experimental techniques, completion and submission of written coursework making use of appropriate forms of IT and VLE, and independent study

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	24
Laboratory / Practical Demonstration / Workshop	24
Independent Study	152
Please select	
Please select	
Please select	
TOTAL	200

Indicative Resources
The following materials form essential underpinning for the module content and ultimately for the learning outcomes: Core text: Organic Chemistry 2nd Edition, J. Clayden, N. Greeves, and S. Warren (2012), Oxford University Press ISBN-978-0-19-927029-3 Also recommended: An Introduction to Drug Synthesis, G. L. Patrick (2015), Oxford University Press, ISBN-978-0-19-870843-8 J A Joule and K Mills, Heterocyclic Chemistry at a Glance, 2nd Edition, Wiley-Blackwell Publishing 2012 ISBN-13: 987-0470971215

J A Joule and K Mills, Heterocyclic Chemistry 5th Edition, Wiley-Blackwell Publishing 2010 ASIN B-1-WEZQIO

P Sykes, Primer to Mechanism in Organic Chemistry, Longman Scientific 1995 0-582266440

P Wyatt and S Warren, Organic Synthesis: Strategy and Control, John Wiley 2007 0-471-48940-5

Synthetic Methods in Organic Electronics and Photonic Materials: A Practical Guide, T. Parker and S. Marder, (2015), RSC, ISBN-978-1-84973-986-3

(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	Andrew McLean
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
Module Appears in CPD catalogue	☐ **Yes** ☒ **No**
Changes / Version Number	2.21 Attendance and Engagement statements updated Assessment 1 changed from Unseen Open Book to Unseen Class Test External Examiner updated Equality statement updated

Assessment (also refer to Assessment Outcomes Grids below)
Assessment 1
Unseen class test (65 %)
Assessment 2
Coursework (35%)
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	☒	☒	☐	☐	☐	65	2

Component 2							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
Report of practical/field/clinical work	☐	☐	☒	☒	☐	35	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
Assessment 1 changed from Unseen Open Book to Unseen Class Test	March 2025	C. McHugh
External Examiner updated	March 2025	C. McHugh
Equality statement updated	March 2025	C. McHugh