

## University of the West of Scotland

Session:2024/25

## Module Descriptor

<b>Title of Module: Chemistry &amp; Reactions</b>			
<b>Code: CHEM07011</b>	<b>SCQF Level: 7</b> (Scottish Credit and Qualifications Framework)	<b>Credit Points: 20</b>	<b>ECTS: 10</b> (European Credit Transfer Scheme)
<b>School:</b>	School of Computing, Engineering and Physical Sciences		
<b>Module Co-ordinator:</b>	Andrew McLean		
<b>Summary of Module</b>			
<p>This module builds on the core understanding of compounds and molecules developed in CHEM 07003 Structure of Chemistry. That module, or its equivalents is (are) pre-requisites for this one.</p> <p>The course concentrates on introducing key concepts covering our understanding of the reactions of organic compounds. It does so by looking at transformations of key functional groups in organic chemistry, followed by an introduction to equilibrium, acids and bases, the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> laws of thermodynamics.</p> <p>The structure of the module is that 2 lectures and a 1 hour tutorial/workshop per week in which prescribed problems are worked through and a short test is taken. There are 6x3 hour laboratory sessions that illustrate the key concepts of the course and provide essential training in the use of basic techniques and safety.</p> <p>The syllabus is as follows: Fundamental properties, preparation, commercial significance, reactions and characterisation of : alkanes, alkenes, alkynes, alkyl halides, alcohols, aldehydes, ketones, amines, Grignard reagents, carboxylic acids and acyl derivatives. Reaction mechanisms. Introduction to aromaticity and the reactions of benzene. Applications of organic chemistry.</p> <p>Chemical equilibrium: dynamic equilibrium, the constants <math>K_c</math> and <math>K_p</math>, basic calculations, extent of reaction, solubility equilibria, pH. Thermodynamics: first law, Hess calculations, bond energies: descriptive introduction to the second law,</p> <p>The graduate attributes relevant to this module are;</p> <ul style="list-style-type: none"> <li>Academic: Critical thinker, analytical, inquiring, knowledgeable, literate, problem solver, autonomous.</li> <li>Personal: Effective communicator, influential, motivated, team-worker.</li> <li>Professional: collaborative.</li> </ul> <p>entropy, Gibbs free energy, relation to equilibrium constant, thermodynamic tables.</p>			

<b>Module Delivery Method</b>					
<b>Face-To-Face</b>	<b>Blended</b>	<b>Fully Online</b>	<b>HybridC</b>	<b>HybridO</b>	<b>Work-based Learning</b>
✓					
<p><b>Face-To-Face</b> Term used to describe the traditional classroom environment where the students and the lecturer meet synchronously in the same room for the whole provision.</p> <p><b>Blended</b> A mode of delivery of a module or a programme that involves online and face-to-face delivery of learning, teaching and assessment activities, student support and feedback. A programme may be considered "blended" if it includes a combination</p>					

of face-to-face, online and blended modules. If an online programme has any compulsory face-to-face and campus elements it must be described as blended with clearly articulated delivery information to manage student expectations

**Fully Online**

Instruction that is solely delivered by web-based or internet-based technologies. This term is used to describe the previously used terms distance learning and e learning.

**HybridC**

Online with mandatory face-to-face learning on Campus

**HybridO**

Online with optional face-to-face learning on Campus

**Work-based Learning**

Learning activities where the main location for the learning experience is in the workplace.

**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)

Paisley:	Ayr:	Dumfries:	Lanarkshire:	London:	Distance/Online Learning:	Other:
✓						

**Term(s) for Module Delivery**

(Provided viable student numbers permit).

Term 1		Term 2		Term 3	
			✓		

**Learning Outcomes: (maximum of 5 statements)**

On successful completion of this module the student will be able to:

L1. Display a basic knowledge of organic, physical and inorganic ideas, including using various information sources.

L2. Demonstrate ability to communicate chemical knowledge and information both qualitatively and quantitatively.

L3. Demonstrate an appreciation of work in a laboratory environment and chemical reactions, tasks and methods.

**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 7. A basic knowledge of functional group reactivity in organic chemistry through use of the general principles organic molecule reactivity.</p> <p>A rudimentary understanding of the principles of chemical equilibrium and thermodynamics.</p>
Practice: Applied Knowledge and Understanding	<p>SCQF Level 7. Developing a systematic approach to understanding basic organic chemical transformations.</p> <p>The use of basic calculations in developing a quantitative understanding of basic chemical systems.</p> <p>Developing a knowledge of fundamental laboratory techniques and</p>

	<p>safe practice.</p> <p>Interpretation of raw data in terms of chemical theory and presentation of results in laboratory report.</p>	
Generic Cognitive skills	<p>SCQF Level 7. Developing the systematic ability to use simple diagrams as shorthand for 3D structures.</p> <p>Application of basic mathematics (algebraic manipulation, graph drawing and interpretation) to quantitative and qualitative understanding of chemical systems.</p> <p>Interpretation of laboratory results in terms of structure and theory.</p> <p>Accurate record keeping and report writing.</p> <p>Producing log books and workbooks as self produced learning resources.</p>	
Communication, ICT and Numeracy Skills	<p>SCQF Level 7. The ability to compile, evaluate, interpret and present information from a wide variety of sources.</p> <p>The use of basic numerical and graph skills.</p> <p>The ability to produce written reports using word and excel.</p>	
Autonomy, Accountability and Working with others	<p>SCQF Level 7. Developing a pro-active approach towards to learning through compilation of reaction log book, workshop book and short test results.</p> <p>Working in small groups to solve specified problems.</p>	
<b>Pre-requisites:</b>	Before undertaking this module the student should have undertaken the following:	
	<b>Module Code:</b>	<b>Module Title:</b>
	<b>Other:</b>	A-Level or Advanced Higher
<b>Co-requisites</b>	<b>Module Code:</b> CHEM07003	<b>Module Title:</b> Structure of Chemistry

\* Indicates that module descriptor is not published.

<b>Learning and Teaching</b>	
<p>This module covers a wide variety of theoretical, conceptual and practical areas, which require a range of knowledge and skills 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.</p>	
<p><b>Learning Activities</b> During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:</p>	<p><b>Student Learning Hours</b> (Normally totalling 200 hours): (Note: Learning hours include both contact hours and hours spent on other learning activities)</p>

Lecture/Core Content Delivery	14
Tutorial/Synchronous Support Activity	10
Laboratory/Practical Demonstration/Workshop	24
Independent Study	152
	200 Hours Total
<b>**Indicative Resources: (eg. Core text, journals, internet access)</b>	
<p>The following materials form essential underpinning for the module content and ultimately for the learning outcomes:  D D Ebbing and S D Gammon, General Chemistry, 11th Edition, 2016, Blawell's</p> <p>G L Patrick, Beginning Organic Chemistry 2, Oxford University Press, 1997 0-198559356 547/PAT</p> <p>CD Notes on Organic Chemistry, available from Chemistry &amp; Chemical Engineering, Paisley</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>	
<b>Engagement Requirements</b>	
<p>In line with the Academic Engagement Procedure, Students are defined as academically engaged if they are regularly engaged with timetabled teaching sessions, course-related learning resources including those in the Library and on the relevant learning platform, and complete assessments and submit these on time. Please refer to the Academic Engagement Procedure at the following link: <a href="#">Academic engagement procedure</a></p>	

### Supplemental Information

<b>Programme Board</b>	Physical Sciences
<b>Assessment Result(Pass/Fail)</b>	No
<b>Subject Panel</b>	Physical Sciences
<b>Moderator</b>	Dr C McHugh
<b>External Examiner</b>	M Symes
<b>Accreditation Details</b>	This module is accredited by IBMS as part of BSc (Hons) Biomedical Science; accredited by IBMS and approved by HPC as part of BSc (Hons) Advanced Biomedical Science; accredited by REHIS as part of BSc (Hons) Environmental Health; accredited by IOSH as part of BSc Occupational Safety and Health; accredited by IChemE as part of BEng (Hons) Chemical Engineering. This module is accredited by the Royal Society of Chemistry (RSC) as part of the BSc (Hons) Chemistry Programme.
<b>Changes/Version Number</b>	2.14 Updated indicative resources

**Assessment: (also refer to Assessment Outcomes Grids below)**

100% continuous assessment (based on contributions of laboratory exercises (50%, Workshop submissions (25%) and short tests (25%) to the final mark).

(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 Handbook.)

**Assessment Outcome Grids (Footnote A.)**

<b>Component 1</b>					
<b>Assessment Type (Footnote B.)</b>	<b>Learning Outcome (1)</b>	<b>Learning Outcome (2)</b>	<b>Learning Outcome (3)</b>	<b>Weighting (%) of Assessment Element</b>	<b>Timetabled Contact Hours</b>
Class test (written)	✓	✓		25	2
Workbook/ Laboratory notebook/ Diary/ Training log/ Learning log	✓	✓		25	0
Clinical/ Fieldwork/ Practical skills assessment/ Debate/ Interview/ Viva voce/ Oral		✓	✓	50	0
<b>Combined Total For All Components</b>				100%	2 hours

**Footnotes**

A. Referred to within Assessment Section above

B. Identified in the Learning Outcome Section above

Note(s):

1. More than one assessment method can be used to assess individual learning outcomes.
2. Schools are responsible for determining student contact hours. Please refer to University Policy on contact hours (extract contained within section 10 of the Module Descriptor guidance note).  
This will normally be variable across Schools, dependent on Programmes &/or Professional requirements.

**Equality and Diversity**

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.

Current University Policy on Equality and Diversity applies.

[UWS Equality and Diversity Policy](#)

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