

**University of the West of Scotland
Module Descriptor**

Session: 2023/24

Title of Module: Chemical Analysis & Evaluation			
Code: CHEM08004	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:	Jorge Chacon		
Summary of Module			
<p>This module presents a review of standardisation and use of commoner reagents in acid/base, redox, precipitation and complexation reactions It will also offer an Introduction to gravimetry, principles, instrumentation and applications of UV/VIS, IR and atomic absorption spectrometry as well as a comparative overview of methods.</p> <p>In addition, the module will include coverage of the following: application of Beer's Law to calibration and to mixtures, brief introduction to principles of chromatography and sorption processes - partition, ion exchange etc, columns, detector types, mobile and stationary phases, outline of high performance liquid chromatography, qualitative and quantitative analysis</p> <p>Also, this module provides an introduction to some of the concepts related to (i) mass balance calculations -applications to straightforward batch processes and steady state flow systems with and without chemical reactions, examples from chemical processing and from the environment-, (ii) statistics and chemical measurement -precision, accuracy and errors, mean, standard deviation and confidence limits, propagation of errors, error in linear calibration-, and (iii) instrument computer interfacing and on-line use of microchips in the measurement, collection and evaluation of chemical data.</p> <p>The Graduate Attributes relevant to this module are listed below: Academic: Critical thinker: analytical, inquiring, knowledgeable, digital literate, problem solver, autonomous, incisive, innovative. Personal: Effective communicator, influential, motivated Professional: Collaborative, research minded, ambitious, driven.</p>			

Module Delivery Method					
Face-To-Face	Blended	Fully Online	HybridC	HybridO	Work-based Learning
	✓		✓		
<p>Face-To-Face 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>Blended 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 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</p> <p>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.</p> <p>HybridC Online with mandatory face-to-face learning on Campus</p>					

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 DeliveryThe 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. Demonstrate an appreciation of a range of classical and modern practices of chemical measurement

L2. Display basic competence in quantitative aspects of stoichiometry, mass balance, analytical and environmental issues.

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 Level 8. Broad knowledge of main concepts associated with statistics and chemical measurement, collection and evaluation of chemical data. Detailed knowledge and understanding of some of the techniques and principles employed in Analytical Chemistry. Some knowledge and understanding of main concepts and principles involved in mass balance
Practice: Applied Knowledge and Understanding	SCQF Level 8. Performing a variety of practical exercises illustrating (i) the use of instrumental techniques such as chromatography and spectroscopy in relation to analytical chemical measurement, and (ii) the principles of mass and energy balance in a system where two input flows are mixed in a reactor with a single outlet. Performing a variety of practical exercises illustrating (i) the use of instrumental techniques such as chromatography and spectroscopy in relation to analytical chemical measurement, and (ii) the principles of mass and energy balance in a system where two input flows are mixed in a reactor with a single outlet.

Generic Cognitive skills	SCQF Level 8. Undertaking a critical analysis of information to draw conclusions from quantitative chemical observations and measurement.	
Communication, ICT and Numeracy Skills	SCQF Level 8. Making effective use of IT skills to obtain, process and evaluate numerical and graphical data to enable the production of appropriate written reports for assignments and laboratory exercises.	
Autonomy, Accountability and Working with others	SCQF Level 8. Working effectively with others when carrying out practical laboratory exercises, and completing appropriate group tasks associated with the coursework element of this module.	
Pre-requisites:	Before undertaking this module the student should have undertaken the following:	
	Module Code: CHEM07011	Module Title: Chemistry & Reactions
	Other:	or appropriate background
Co-requisites	Module Code:	Module Title:

* Indicates that module descriptor is not published.

Learning and Teaching	
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.	
Learning Activities During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:	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	18
Tutorial/Synchronous Support Activity	10
Laboratory/Practical Demonstration/Workshop	20
Independent Study	152
	200 Hours Total
**Indicative Resources: (eg. Core text, journals, internet access)	
The following materials form essential underpinning for the module content and ultimately for the learning outcomes:	

Analytical Chemistry, Gary D. Christian, Purnendu K. Dasgupta, Kevin A. Schug, Wiley Global Education, 7th Edition, 2014, ISBN: 9781118805275

Fundamentals of Analytical Chemistry, D A Skoog, D M West and F J Holler, Brooks Cole, 9th Edition, 2014. ISBN: 978-0495558286

Chemical Analysis & Evaluation: Reference Booklet, A. Watson, A.C. Roach R.S. Sinclair, J.N. Chacón, University of the West of Scotland. 2017.

(**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)

Engagement Requirements

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: [Academic engagement procedure](#)

Where a module has Professional, Statutory or Regulatory Body requirements these will be listed here:

Attending classes/workshops and submitting coursework (short-tests, workshops)

Supplemental Information

Programme Board	Physical Sciences
Assessment Results (Pass/Fail)	No
Subject Panel	Physical Sciences
Moderator	Dr Callum McHugh
External Examiner	M Paterson
Accreditation Details	This module is accredited by Royal Society of Chemistry (RSC) as part of BSc (Hons) Chemistry programme.
Changes/Version Number	2.13 (i) Lectures: 18 hours, (ii) Tutorials: 10 hours (iii) Laboratory/Practicals: 20 hours (iv) Update module engagement requirements. Section 9 - Module Delivery has been updated (15/03/2023)

Assessment: (also refer to Assessment Outcomes Grids below)

Formal Written Examination (50%).

Coursework (Written Assignment (5%), Class-Test (10%), Laboratory Reports (20%), Group Case Study (5%), workshop (10%).

(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.)

Component 1				
Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Weighting (%) of Assessment Element	Timetabled Contact Hours
Unseen closed book (standard)	✓	✓	50	2
Component 2				
Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Weighting (%) of Assessment Element	Timetabled Contact Hours
Class test (written)	✓	✓	10	2
Essay	✓	✓	5	5
Portfolio of written work	✓	✓	10	10
Review/ Article/ Critique/ Paper	✓	✓	5	5
Portfolio of practical work	✓	✓	20	20
Combined Total For All Components			100%	44 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)