University of the West of Scotland

Module Descriptor

Session: 2024/25

Title of Module: Chemical Analysis and Evaluation			
Code: CHEM08004	**SCQF Level: 9 (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:	Dr Alastair Marr		

Summary of Module

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.
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
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.
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.

Module Delivery Method

Face-To-Face	Blended	Fully Online	HybridC	Hybrid0	Work-Based Learning
☒	☐	☐	☐	☐	☐

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:
☒	☐	☐	☐	☐	☐	Add name

Term(s) for Module Delivery					
(Provided viable student numbers permit).					
Term 1	☐	Term 2	☒	Term 3	☐

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	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.
L3	Click or tap here to enter text.

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 and Reactions
	Other:	or appropriate background.
Co-requisites	**Module Code:**	**Module Title:**

*Indicates that module descriptor is not published.

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.	
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 M Marr, C J McHugh, J N Chacon

Please ensure the list is kept short and current. Essential resources should be included, broader resources should be kept for module handbooks / Aula VLE.

Resources should be listed in Harvard Cite Them Rite referencing style or agreed professional body deviation and in alphabetical order.

(**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:

Academic Engagement procedure

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. Please ensure any specific requirements are detailed in this section. Module Co-ordinators should consider the accessibility of their module for groups with protected characteristics..
(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 ☐No ☒
School Assessment Board	Physical Sciences
Moderator	Dr Callum McHugh
External Examiner	M Paterson
Accreditation Details	This module is accredited by the royal Society of Chemistry(RSC) as part of the BSc(Hons) Chemistry programme
Changes/Version Number	2.13

Assessment: (also refer to Assessment Outcomes Grids below)
This section should make transparent what assessment categories form part of this module (stating what % contributes to the final mark). Maximum of 3 main assessment categories can be identified (which may comprise smaller elements of assessment). **NB: The 30% aggregate regulation (Reg. 3.9) (40% for PG) for each main category must be taken into account. When using PSMD, if all assessments are recorded in the one box, only one assessment grid will show and the 30% (40% at PG) aggregate regulation will not stand. For the aggregate regulation to stand, each component of assessment must be captured in a separate box.** Please provide brief information about the overall approach to assessment that is taken within the module. In order to be flexible with assessment delivery, be brief, but do state assessment type (e.g. written assignment rather than “essay” / presentation, etc) and keep the detail for the module handbook. Click or tap here to enter text.
Assessment 1 - Class test

Assessment 2 - Coursework
(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)**	**Learning Outcome (4)**	**Learning Outcome (5)**	**Weighting (%) of Assessment Element**	**Timetabled Contact Hours**
Closed book on campus assessment	X	X				50	2

Component 2							
Assessment Type (Footnote B.)	**Learning Outcome (1)**	**Learning Outcome (2)**	**Learning Outcome (3)**	**Learning Outcome (4)**		**Weighting (%) of Assessment Element**	**Timetabled Contact Hours**
Class Test (written)	X	X				10	2
Essay (Stoichiometry)	X	X				5	5
Portfolio of written work	X	X				10	10
Portfolio of practical work	X	X				20	20
Review / Article / Critique / Paper	X	X				5	5

Combined Total for All Components	**100%**	**44 hours**

Change Control:

What	**When**	**Who**
Change to Face to Face teaching		
Change from Adapted Assessment to Class Test		

Version Number: MD Template 1 (2023-24)