

Session: 2022/23

Last modified: 10/01/2023 15:29:12

Title of Module: Analytical Measurement			
Code: CHEM08009	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:	Mostafa Rateb		
Summary of Module			
<p>This module uses a blended approach to learning with recorded lectures, live workshops and laboratory classes. It is assessed through a lab report and a class test.</p> <p>This module looks at the acquisition and analysis of chemical data for use in forensic science, there are three main sections; chemistry fundamentals, chemical analysis and data processing.</p> <p>Chemistry fundamentals includes the periodic table, chemical bonding, states of matter, moles and concentration, balanced chemical equations and the units used in chemistry.</p> <p>Chemical analysis covers introductory spectroscopic analysis using UV/VIS, infrared and atomic absorption spectrometry, and chromatography.</p> <p>Data handling is covered with a review of basic statistical principles, trend analysis, precision, accuracy and errors. There will be a case study on practical applications of chemical analysis. Students will gain skills in the collection, manipulation and interpretation of analytical data, and in the background theory and application of analysis methods.</p> <p>Practical exercises will include a selection of; thin layer chromatography of amphetamines, atomic absorption analysis of the metal content of glasses, HPLC quantification of caffeine in drinks, UV/visible spectroscopy of salicylates and identification of drugs using infrared spectroscopy.</p> <p>Undertaking this module will help the students to develop a range of 'I am UWS' Graduate Attributes.</p> <p>Universal – development of critical thinking, ethically and research minded.</p> <p>Work Ready – an effective problem solver, communicator and ambitious.</p> <p>Successful – by being autonomous, resilient and 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> <p>HybridO Online with optional face-to-face learning on Campus</p>					

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
	✓	

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Learning Outcomes: (maximum of 5 statements)

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

- L1. Explain the structure of the periodic table and the types of bonding found in elements and molecules.
- L2. Understand the meaning of different units used in chemistry
- L3. Show an understanding of the basic principles of spectroscopy and chromatography and their application in the identification and quantification of materials
- L4. Understand the application of routine numerical methods for the presentation and interpretation of data from analytical measurement.

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. Develop a detailed knowledge of chemical analysis principles and basic numerical manipulation. Details of core chemical and analytical theories and applications to real world conditions including principles of information search and retrieval.
Practice: Applied Knowledge and Understanding	SCQF Level 8. Understand the application of chemical analysis in the context of forensic science. Manipulation of basic data analysis tools, calculations and interpretation
Generic Cognitive skills	SCQF Level 8. Apply strategies for the appropriate selection of relevant information from a wide source and large body of knowledge Apply the skills needed for academic study and enquiry, interpretation of data in wider environmental and analytical applications.
Communication, ICT and Numeracy Skills	SCQF Level 8. Demonstrate an appreciation for quantitative analysis and their limitations and advantages, common forms of measurement, data

	handling, representation, and interpretation, use of numerical methods and spreadsheets.	
Autonomy, Accountability and Working with others	SCQF Level 8. Exercise autonomy and initiative in individual study task – collecting and reviewing database materials, identifying relevant material and incorporating/interpreting outcomes.	
Pre-requisites:	Before undertaking this module the student should have undertaken the following:	
	Module Code:	Module Title:
	Other:	Suitable appropriate background
Co-requisites	Module Code:	Module Title:

* Indicates that module descriptor is not published.

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Learning and Teaching	
<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), completion and submission of written coursework making use of appropriate forms of IT and VLE, and independent study.</p>	
<p>Learning Activities During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:</p>	<p>Student Learning Hours (Normally totalling 200 hours): (Note: Learning hours include both contact hours and hours spent on other learning activities)</p>
Lecture/Core Content Delivery	12
Tutorial/Synchronous Support Activity	12
Laboratory/Practical Demonstration/Workshop	24
Independent Study	152
	200 Hours Total
<p>**Indicative Resources: (eg. Core text, journals, internet access)</p>	
<p>The following materials form essential underpinning for the module content and ultimately for the learning outcomes: Langford, A., 2018. Practical skills in forensic science, 3rd Edition. Pearson Education</p> <p>Analytical Chemistry, G D Christian, John Wiley & Sons, 6th Edition, 2004 543/CHR (6th Edn 2004, ISBN: 978-0-471-21472-4)</p> <p>Fundamentals of Analytical Chemistry, D A Skoog, D M West and F J Holler, Saunders College Publishing, 7th Edition, 2000 0 030 059380 543/SKO</p>	

Quantitative Chemical Analysis, D C Harris, Freeman, 8th Edition (ISBN-13: 978-1-4292-3989-9)

(**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](#)

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Supplemental Information

Programme Board	Physical Sciences
Assessment Results (Pass/Fail)	No
Subject Panel	Physical Sciences
Moderator	Mohammed Yaseen
External Examiner	M Paterson
Accreditation Details	
Version Number	2.11

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Assessment: (also refer to Assessment Outcomes Grids below)

Assessment will be based on continuous assessment throughout the module with a final class test contributing 50% and Lab reports worth 50% of 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.)

Component 1							
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)	✓	✓	✓	✓	50	0	

Report of practical/ field/ clinical work	✓	✓	✓	✓	50	0	
Combined Total For All Components					100%	0 hours	

Footnotes

A. Referred to within Assessment Section above

B. Identified in the Learning Outcome Section above

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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, special support can be provided where necessary, consequently, if special 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)