

## University of the West of Scotland

## Module Descriptor

Session: 2024/25

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 lectures, live workshops and laboratory classes. It is assessed through lab reports and class tests.</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, titration of acetic acid, atomic absorption analysis of the metal content of glasses, HPLC quantification of caffeine in drinks, and GC analysis of alcohols.</p> <p>Undertaking this module will help the students to develop a range of 'I am UWS' Graduate Attributes:</p> <p><u>Universal</u> – development of critical thinking, ethically and research minded.</p> <p><u>Work Ready</u> – an effective problem solver, communicator and ambitious.</p> <p><u>Successful</u> – by being autonomous, resilient, and driven.</p>			

Module Delivery Method					
Face-To-Face	Blended	Fully Online	HybridC	Hybrid 0	Work-Based Learning
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
See Guidance Note for details.					

Campus(es) for Module Delivery						
The module will <b>normally</b> 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:
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Add name

Term(s) for Module Delivery					
(Provided viable student numbers permit).					
Term 1	<input type="checkbox"/>	Term 2	<input checked="" type="checkbox"/>	Term 3	<input type="checkbox"/>

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	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 <b>8</b> 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	<b>SCQF Level 8</b> Understand the application of chemical analysis in the context of forensic science. Manipulation of basic data analysis tools, calculations and interpretation	
Generic Cognitive skills	<b>SCQF Level 8</b> 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	<b>SCQF Level 8</b> 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	<b>SCQF Level 8</b> Exercise autonomy and initiative in individual study task – collecting and reviewing database materials, identifying relevant material and incorporating/interpreting outcomes.	
<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>	
<b>Co-requisites</b>	<b>Module Code:</b>	<b>Module Title:</b>

\*Indicates that module descriptor is not published.

<b>Learning and Teaching</b> 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 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.	
<b>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.</b>	
<b>Learning Activities</b> During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:	<b>Student Learning Hours</b> (Normally totalling 200 hours): (Note: Learning hours include both contact hours and hours spent on other learning activities)
Lecture/Core Content Delivery	12
Tutorial/Synchronous Support Activity	12

Laboratory/Practical Demonstration/Workshop	24
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:

Langford, A., 2018. Practical skills in forensic science, 3rd Edition. Pearson Education

Analytical Chemistry, G D Christian, John Wiley & Sons, 7th Edition, 2014 543/CHR (7th Edn 2014, ISBN: 978-0-471-21472-4)

Fundamentals of Analytical Chemistry, D A Skoog, D M West and F J Holler, Saunders College Publishing, 9th Edition, 2014 0 030 059380 543/SKO

Quantitative Chemical Analysis, D C Harris, Freeman, 8th Edition, 2010 (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)

**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:

Students should attend all face-to-face lectures, workshops and laboratories. They should submit their short tests and lab reports in the allocated links online before the specified deadline.

**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..

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

(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

<b>Divisional Programme Board</b>	Physical Sciences
<b>Assessment Results (Pass/Fail)</b>	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<b>School Assessment Board</b>	Physical Sciences
<b>Moderator</b>	Mohammed Yaseen
<b>External Examiner</b>	M Paterson
<b>Accreditation Details</b>	This is a core module in the BSc (Hons) Criminal Justice and Forensic Science programme which is recognised by the Chartered Society of Forensic Sciences.
<b>Changes/Version Number</b>	Module Coordinator and Moderator updated (16/03/2023)

#### 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 – Lab reports – 50%

Assessment 2 – short tests – 50%

(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
Class test (written)	X	X	X	X	X	50	0

Component 2							
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
Report of practical/field / clinical work	X	X	X	X	X	50	0

<b>Combined Total for All Components</b>						<b>100%</b>	<b>0 hours</b>
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