Module Descriptor

Title	Analytical Measurement		
Session	2025/26	**Status**	Published
Code	CHEM08009	**SCQF Level**	8
Credit Points	20	**ECTS (European Credit Transfer Scheme)**	10
School	**Computing, Engineering and Physical Sciences**		
Module Co-ordinator	Mostafa Rateb		

Summary of Module

This module uses a blended approach to learning with lectures, live workshops and laboratory classes. It is assessed through lab reports and class tests.

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.

Chemistry fundamentals includes the periodic table, chemical bonding, states of matter, moles and concentration, balanced chemical equations and the units used in chemistry.

Chemical analysis covers introductory spectroscopic analysis using UV/VIS, infrared and atomic absorption spectrometry, and chromatography.

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.

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.

Module Delivery Method	**On-Campus[1]**	**Hybrid[2]**	**Online[3]**	**Work -Based Learning[4]**
	☒	☐	☐	☐

[1] Where contact hours are synchronous/ live and take place fully on campus. Campus-based learning is focused on providing an interactive learning experience supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus contact hours will be clearly articulated to students.

[2] The module includes a combination of synchronous/ live on-campus and online learning events. These will be supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus and online contact hours will be clearly articulated to students.

[3] Where all learning is solely delivered by web-based or internet-based technologies and the participants can engage in all learning activities through these means. All required contact hours will be clearly articulated to students.

[4] Learning activities where the main location for the learning experience is in the workplace. All required contact hours, whether online or on campus, will be clearly articulated to students

Campuses for Module Delivery	☐ Ayr ☐ Dumfries		☐ Lanarkshire ☐ London ☒ Paisley		☐ Online / Distance Learning ☐ Other (specify)	
Terms for Module Delivery	Term 1	☐	Term 2	☒	Term 3	☐
Long-thin Delivery over more than one Term	Term 1 – Term 2	☐	Term 2 – Term 3	☐	Term 3 – Term 1	☐

Learning Outcomes	
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.
L5	

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 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 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 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 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 8**

	Exercise autonomy and initiative in individual study task – collecting and reviewing database materials, identifying relevant material and incorporating/interpreting outcomes.

Prerequisites	**Module Code**	**Module Title**
	Other Or, suitable appropriate background	
Co-requisites	**Module Code**	**Module Title**

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. 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	
Learning Activities During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:	**Student Learning 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
Please select	
Please select	
TOTAL	200

Indicative Resources
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, 9thEdition, 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:** The School of Computing, Engineering and Physical Sciences considers attendance and engagement to mean a commitment to attending, and engaging in, timetabled sessions. You will scan your attendance via the scanners each time you are on-campus and you will login to the VLE several times per week. Where you are unable to attend a timetabled learning session due to illness or other circumstance, you should notify the Programme Leader that you cannot attend. Across the School an 80% attendance threshold is set. If you fall below this, you will be referred to the Student Success Team to see how we can best support your studies.

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. Aligned with the University's commitment to equality and diversity, this module supports equality of opportunity for students from all backgrounds and learning needs. Using the VLE, material will be presented electronically in formats that allow flexible access and manipulation of content. This module complies with University regulations and guidance on inclusive learning and teaching practice. This module has lab-based teaching and as such you are advised to speak to the Module Co-ordinator to ensure that specialist assistive equipment, support provision and adjustment to assessment practice can be put in place, in accordance with the University's policies and regulations.
(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	**Engineering Physical Sciences**
Overall Assessment Results	☐ **Pass / Fail** ☒ **Graded**
Module Eligible for Compensation	☐ **Yes** ☒ **No** **If this module is eligible for compensation, there may be cases where compensation is not permitted due to programme accreditation requirements. Please check the associated programme specification for details.**
School Assessment Board	Physical Sciences
Moderator	Mohammed Yaseen
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 and the Chartered Society of Forensic Sciences (CSFS) as part of the BSc (Hons) Forensic Science programme
Module Appears in CPD catalogue	☐ **Yes** ☒ **No**
Changes / Version Number	2.21 Attendance and Engagement statements updated Equality statement updated

Assessment (also refer to Assessment Outcomes Grids below)
Assessment 1
Unseen class test (50 %)
Assessment 2
Continuous assessment: laboratory work/reports and written tutorial work (50%)
Assessment 3
(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.)

Component 1							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
Unseen class test	☒	☒	☒	☐	☐	50	2

Component 2							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
Workbook/Laboratory notebook/diary/training log/learning log	☒	☒	☒	☐	☐	50	36

Component 3							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
	☐	☐	☐	☐	☐		
Combined total for all components						100%	0 hours

Change Control

What	When	Who
Attendance and engagement statements updated	March 2025	M. Rateb
Equality statement updated	March 205	M. Rateb