Module Descriptor

Title	Forensic Analytical Techniques		
Session	2024/25	**Status**	Published
Code	BIOL09015	**SCQF Level**	9
Credit Points	20	**ECTS (European Credit Transfer Scheme)**	10
School	**Health and Life Sciences**		
Module Co-ordinator	Jamie Whitelaw		

Summary of Module

This module focuses on two key types of forensic samples: DNA and controlled drugs. Starting with evidence collection at the scene of crime you will follow the process through analysis in the laboratory to interpretation,analysis and application of the results.

DNA profiling is perhaps one of the most reliable and conclusive methods of personal identification available to Forensic Scientists. It is a highly sensitive technique which is used in forensic science for example in criminal cases, victim identification and paternity cases. You will have an opportunity to practice techniques used to collect DNA from a crime scene and to obtain a DNA profile. Knowledge of DNA structure, organisation and pattern of inheritance will enable interpretation of DNA profiles and analyse the benefits and limitations of DNA profiling using case studies. Current and future developments such as DNA phenotypying will be considered.

Any samples seized which are suspected of being controlled drugs have to be definitively identified in order to secure a conviction. This module will demonstrate how to take a non-descript solid sample, such as a white powder and identify what illegal drug(s) it contains. The module will discuss the major classes of illegal drugs and how each group can be identified and quantified by chemical analysis.

The following graduate attributes can be developed in this module: critical thinker, analytical, Knowledeable, problem solver, ethically minded and collaborative.

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	Outline the main classes of controlled substances and the techniques employed in their analysis
L2	Explain the principles, applications and ethics of DNA Profiling
L3	Select and apply appropriate analytical techniques to analyse DNA and controlled substances
L4	Explain the function and practice of quality assurance in the analysis of forensic samples
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 9** Demonstrate a broad and integrated knowledge of controlled substances and the methods employed to analyse them. Demonstrate a critical understanding of principal concepts and applications of DNA profiling.
Practice: Applied Knowledge and Understanding	**SCQF 9** Use the theoretical knowledge gained to perform appropriate techniques and analyse the results in the context of the theory.
Generic Cognitive skills	**SCQF 9** Critically analyse the technique(s), implications including ethical issues of DNA profiling and controlled substances.
Communication, ICT and Numeracy Skills	**SCQF 9** Communicate effectively orally and in writing. Analyse and interpret data where appropriate.
Autonomy, Accountability and Working with Others	**SCQF 9** Working in teams to perform practical work and to research and present information will require time management, organisational skills and an understanding of professional practice.

Prerequisites	Module Code	Module Title
	Other	
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. Core theory and concepts will delivered face to face using lectures, short videos, tutorials, case studies and discussions where student participation will be expected. The material will provide underpinning knowledge of DNA Profiling e.g. DNA structure, organisation and techniques used to collect and analyse DNA. Detailed discussion of the main groups of controlled substances, the testing regimens applied and the main analytical techniques used to generate the qualitative and quantitative evidence used to support forensic cases. Practical work will apply the theoretical knowledge and give the students practical experience of the techniques used to analyse controlled substances and DNA. Students will be introduced to quality assurance practices in forensic laboratories and these will be applied throughout the practicals. The learning and teaching strategies applied to this module contribute towards the development of UWS graduate attributes: • Universal: Inquiring, analytical, research-minded • Work Ready: Knowledgeable,problem solver, effective communicator • Successful: Creative, driven

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	24
Laboratory / Practical Demonstration / Workshop	12
Tutorial / Synchronous Support Activity	12
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:

Jackson, A.R.W. & Jackson, J.M. (2016) Forensic Science 4th Edition (Pearson) ISBN-10: 9781292088181

Cole, M.D. (2003) The Analysis of Controlled Substances (Wiley) ISBN 0 471 49252 3

Cole, M.D. & Caddy, B. (1994) The Analysis of Drugs of Abuse: An Instruction Manual (Ellis Horwood) ISBN 0 130 35098 2

Web site http://www.dnalc.org/ Dolan DNA Learning Centre, Cold Spring Harbor Laboratory particularly DNA from the Beginning is an excellent site on the background molecular Biology and genetics.

(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:

Where a module has Professional, Statutory or Regulatory Body requirements these will be listed here: Attendance at synchronous sessions (lectures, workshops, lab practical and tutorials) , completion and submission of assessments to meet the learning outcomes of the module.

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.

In line with current legislation (Equality Act, 2010) and the UWS Equality, Diversity, and Human Rights Code, our modules are accessible and inclusive, with reasonable adjustment for different needs where appropriate. Module materials comply with University guidance on inclusive learning and teaching, and specialist assistive equipment, support provision and adjustment to assessment practice will be made in accordance with UWS policy and regulations. Where modules require practical and/or laboratory based learning or assessment required to meet accrediting body requirements the University will make reasonable adjustment such as adjustable height benches or assistance of a 'buddy' or helper.

(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	**Biological Sciences Health**
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	Biology
Moderator	David Thompson
External Examiner	A Tsaousis
Accreditation Details	This module is part of the BSc (Hons) Applied Bioscience with Forensic Investigation programme; accredited by Royal Society of Biology (RSB)
Module Appears in CPD catalogue	☐ **Yes** ☒ **No**
Changes / Version Number	2.11

Assessment (also refer to Assessment Outcomes Grids below)
Assessment 1
Two 2-hour class tests worth 50% of module mark.
Assessment 2
Coursework consisting of practical reports and case study worth 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**
Class test (written)	☒	☒	☐	☒	☐	50	4

Component 2							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
Portfolio of practical work	☐	☐	☒	☒	☐	50	0

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

Change Control

What	When	Who
MC changed to Jamie Whitelaw	04.2024	JW
Module Delivery hours amended in Line with CF	04.2024	JW
SAB change to just Biology removing the level	04.2024	JW