

## University of the West of Scotland

## Module Descriptor

Session: 2024/25

<b>Title of Module:</b> Trace Evidence & Microscopy			
<b>Code:</b> CHEM09008	<b>SCQF Level: 9</b> <b>(Scottish Credit and Qualifications Framework)</b>	<b>Credit Points:</b> 20	<b>ECTS: 10</b> <b>(European Credit Transfer Scheme)</b>
<b>School:</b>	School of Computing, Engineering and Physical Sciences		
<b>Module Co-ordinator:</b>	Ciaran T Ewins		
<b>Summary of Module</b>			
<p>Trace evidence has become crucial to forensic science as techniques such as microscopy and spectroscopy have advanced. This module examines the sources and the physical nature of the various types of trace evidence especially glass, gunshot residue, hairs, fibres and selected biological material. Microscopical techniques to gain quantitative and qualitative information from these evidence types are introduced. Forensic entomology is introduced. The management of scenes of crime to avoid contamination of trace evidence and collection and packaging are introduced. Laboratory work is important in this area and time will be spent in the lab using light and polarising light microscopes to recover and examine trace evidence. The use of infra red and scanning electron microscopy with x-ray analysis of trace materials is covered.</p> <p>Those who complete this module will have developed academic competencies in report writing and problem solving and practical knowledge and skills related to research and laboratory work in Forensic Science. Selected practical activities include</p> <ul style="list-style-type: none"> <li>• Garment examination and recovery of trace evidence</li> <li>• Optical microscopy of biological materials, hairs and fibres</li> <li>• Polarised Light Microscopy of glass, hairs and fibres</li> <li>• Infra-red spectroscopy of trace evidence</li> <li>• Scanning Electron Microscopy</li> </ul>			

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

<b>Campus(es) for Module Delivery</b>
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

<b>Term(s) for Module Delivery</b>
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(Provided viable student numbers permit).
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Term 1	<input checked="" type="checkbox"/>	Term 2	<input type="checkbox"/>	Term 3	<input type="checkbox"/>
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<b>Learning Outcomes: (maximum of 5 statements)</b>
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<b>These should take cognisance of the SCQF level descriptors and be at the appropriate level for the module.</b>
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At the end of this module the student will be able to:
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L1	Describe the sources and nature of common trace evidence and the methods available for its collection and study.
L2	Demonstrate a critical understanding of the principals and terminology of forensic microscopy and the operation of light and electron microscopes.
L3	Describe of the principles of infra red microscopy/spectroscopy and be able to apply this technique to the identification of routine fibres types.
L4	Show skill in the handling of trace evidence and in the use of optical microscopy to study and characterise trace evidence including geological, biological and fibre materials

<b>Employability Skills and Personal Development Planning (PDP) Skills</b>
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<b>SCQF Headings</b>	During completion of this module, there will be an opportunity to achieve core skills in:
Knowledge and Understanding (K and U)	<p><b>SCQF Level 9</b> A broad and integrated knowledge of the role of microscopy in forensic science and the variety of microscopic methods available.</p> <p>A broad knowledge of the sources and uses of different type of trace evidence including hairs, fibres, glass, gunshot residue and biological material.</p> <p>A detailed understanding of the contamination issues in evidence handling, packaging and recovery.</p>
Practice: Applied Knowledge and Understanding	<p><b>SCQF Level 9</b> A detailed knowledge of polarized light and compound microscope methods used to investigate trace materials.</p> <p>Be able to carry out the routine methods of infra red spectroscopy to identify and compare fibres.</p> <p>Techniques used to recover trace evidence</p>

	Issues related to the interpretation of trace evidence	
Generic Cognitive skills	<p><b>SCQF Level 9</b> Undertake analysis of information from spectroscopic and microscopic examination of evidence</p> <p>Formulate approaches to dealing with evidence containing trace materials</p> <p>Analyse the presentation of trace evidence in court and ways that its use can be questioned</p>	
Communication, ICT and Numeracy Skills	<p><b>SCQF Level 9</b></p> <p>Present information from evidence examination in notes, sketches, reports and photographs</p> <p>Use Microsoft Office applications to prepare reports and presentations.</p>	
Autonomy, Accountability and Working with others	<p><b>SCQF Level 9</b> Demonstrate initiative and judgement in deciding how to deal with evidence</p> <p>Show a professional approach to the interpretation of information from trace evidence.</p>	
<b>Pre-requisites:</b>	Before undertaking this module the student should have undertaken the following:	
	<b>Module Code:</b> CHEM07013	<b>Module Title:</b> Molecules of Life
	<b>Other:</b>	Suitable alternative
<b>Co-requisites</b>	<b>Module Code:</b>	<b>Module Title:</b>

\*Indicates that module descriptor is not published.

<b>Learning and Teaching</b>	
<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>	
<p><b>Learning Activities</b> During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:</p>	<p><b>Student Learning Hours</b> (Normally totalling 200 hours): (Note: Learning hours include both contact hours and hours spent on other learning activities)</p>
Lecture/Core Content Delivery	24
Laboratory/Practical Demonstration/Workshop	24

Independent Study	152
	200 Hours Total
<b>**Indicative Resources: (eg. Core text, journals, internet access)</b>	
<p>The following materials form essential underpinning for the module content and ultimately for the learning outcomes:</p> <p>Andrew Jackson and Julie Jackson, Forensic Science, 4th Ed., Pearson Education Ltd. (2017) ISBN 978-1-292-08818-1</p> <p>Brian Caddy (ed) Forensic Examination of Glass and Paint - Analysis and Interpretation (2001), publ. Taylor &amp; Francis Forensic Science Series, isbn 0-203-48358-8</p> <p>James Robertson and Micheal Grieve (ed) Forensic Examination of Fibres 2nd Ed, (1999) , publ. Taylor and Francis, isbn 0-7484-0816-9</p> <p>Please ensure the list is kept short and current. Essential resources should be included, broader resources should be kept for module handbooks / Aula VLE.</p> <p>Resources should be listed in Right Harvard referencing style or agreed professional body deviation and in alphabetical order.</p>	
<p>(*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)</p>	
<b>Attendance and Engagement Requirements</b>	
<p>In line with the <a href="#">Student Attendance and Engagement Procedure</a>: 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.</p> <p>For the purposes of this module, academic engagement equates to the following:</p> <p>Students are expected to attend all classes. Submit coursework and engage regularly with the VLE.</p>	
<b>Equality and Diversity</b>	
<p>The University's Equality, Diversity and Human Rights Procedure can be accessed at the following link: <a href="#">UWS Equality, Diversity and Human Rights Code</a>.</p> <p>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..</p>	

(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>	Dr Callum McHugh
<b>External Examiner</b>	I Turner
<b>Accreditation Details</b>	This module is part of programmes Accredited and recognised by the Chartered Society of Forensic Sciences
<b>Changes/Version Number</b>	Summary of Module minor edits  Module Delivery: From Hybrid-C to Face-to-Face.  Attendance and Engagement Requirements made clear.  Accreditation Details: Chartered Society of Forensic Sciences added

### Assessment: (also refer to Assessment Outcomes Grids below)

Assessment 1 – Class Tests 40%

Assessment 2 – Lab Reports 60%

(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)**

<b>Component 1</b>							
<b>Assessment Type (Footnote B.)</b>	<b>Learning Outcome (1)</b>	<b>Learning Outcome (2)</b>	<b>Learning Outcome (3)</b>	<b>Learning Outcome (4)</b>	<b>Learning Outcome (5)</b>	<b>Weighting (%) of Assessment Element</b>	<b>Timetabled Contact Hours</b>
Lab reports	✓	✓	✓	✓		60	

<b>Component 2</b>							
<b>Assessment Type (Footnote B.)</b>	<b>Learning Outcome (1)</b>	<b>Learning Outcome (2)</b>	<b>Learning Outcome (3)</b>	<b>Learning Outcome (4)</b>	<b>Learning Outcome (5)</b>	<b>Weighting (%) of Assessment Element</b>	<b>Timetabled Contact Hours</b>
Class Tests	✓	✓	✓			40	
<b>Combined Total for All Components</b>						<b>100%</b>	<b>0 hours</b>