

University of the West of Scotland  
Module Descriptor  
Published 2024/25 Module Descriptor

**Session: 2024/25**

<b>Title of Module: Network Penetration Testing</b>			
<b>Code: COMP11094</b>	<b>SCQF Level: 11</b> (Scottish Credit and Qualifications Framework)	<b>Credit Points: 10</b>	<b>ECTS: 5</b> (European Credit Transfer Scheme)
<b>School:</b>	School of Computing, Engineering and Physical Sciences		
<b>Module Co-ordinator:</b>	Jose M. Alcaraz Calero		
<b>Summary of Module</b>			
<p>This module provides students with the knowledge and skills to enable them to test networks for vulnerabilities and resolve and prevent them. Penetration testing methodologies and techniques are covered and students will use these tools to perform and detect attacks as well as put in place measures to protect against attacks.</p> <p>This module will work to develop a number of the key <b>'I am UWS' Graduate Attributes</b> to make those who complete this module:</p> <p><b>Universal</b></p> <ul style="list-style-type: none"> <li>• Critical Thinker</li> <li>• Ethically-minded</li> <li>• Research-minded</li> </ul> <p><b>Work Ready</b></p> <ul style="list-style-type: none"> <li>• Problem-Solver</li> <li>• Effective Communicator</li> <li>• Ambitious</li> </ul> <p><b>Successful</b></p> <ul style="list-style-type: none"> <li>• Autonomous</li> <li>• Resilient</li> <li>• Driven</li> </ul>			

<b>Module Delivery Method</b>					
<b>Face-To-Face</b>	<b>Blended</b>	<b>Fully Online</b>	<b>HybridC</b>	<b>HybridO</b>	<b>Work-based Learning</b>
	✓				
<p><b>Face-To-Face</b> 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><b>Blended</b> 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><b>Fully Online</b> 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><b>HybridC</b> Online with mandatory face-to-face learning on Campus</p> <p><b>HybridO</b> Online with optional face-to-face learning on Campus</p> <p><b>Work-based Learning</b> Learning activities where the main location for the learning experience is in the workplace.</p>					

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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)						
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		

Learning Outcomes: (maximum of 5 statements)	
<p>On successful completion of this module the student will be able to:</p> <p>L1. Demonstrate an understanding of the main theories, concepts and methodologies of network penetration testing.</p> <p>L2. Apply knowledge and skills to test systems for security vulnerabilities and mitigate against them.</p> <p>L3. Analyse and critically evaluate security issues so as to produce resilient network infrastructures.</p>	
Employability Skills and Personal Development Planning (PDP) Skills	
<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)	SCQF Level 11. Students will learn systematic and comprehensive knowledge of Network Penetration Testing . Students are expected to be familiar with the key technologies and techniques and their application in practice.
Practice: Applied Knowledge and Understanding	SCQF Level 11. Students will gain in-depth, comprehensive understanding and critical awareness of knowledge of Network Penetration Testing, and apply this in planning, implementing, and compromising several networked hosts. They will also develop capability to apply a range of standard and specialised research skills, tools/software, development kit and related techniques in response to application requirements for their written assignment and lab tasks.
Generic Cognitive skills	SCQF Level 11. To complete their written reports and laboratory tasks, students will first build skills to integrate information and apply knowledge from various sources including technology advances informed by research and industry.
Communication, ICT and Numeracy Skills	SCQF Level 11. Working in interacting groups, students will develop communication skills as well as the ability to write technical reports and documentation.
Autonomy,	SCQF Level 11.

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Accountability and Working with others	Each student will generate a comprehensive report summarising his/her finding for a given scenario.	
<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>	
<p>The module will be delivered by means of lectures and supervised hands-on lab work. Lectures will cover the theoretical background and practical applicability in real life problems. Concepts will be introduced by posing a practical problem and working out the needed theoretical knowledge to solve them. The delivery will encourage student participation to ensure an active learning experience. Group discussions will be held to promote critical thinking and boost informed decisions on the suitability of different state-of-the-art methods. Lab exercises will help student develop their knowledge in incremental fashion using a learning-by-doing approach. This will support the development of knowledge and understanding of the topics.</p>	
<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	6
Tutorial/Synchronous Support Activity	6
Laboratory/Practical Demonstration/Workshop	12
Independent Study	76
	100 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: Sammons, G. (2017) Penetration Testing: Network Security for Absolute Beginners. CreateSpace Independent Publishing Platform.</p> <p>White, A.K. (2017) Hacking: The Underground Guide to Computer Hacking, Including Wireless Networks, Security, Windows, Kali Linux and Penetration Testing. CreateSpace Independent Publishing Platform.</p> <p>Kim, P. (2018) The Hacker Playbook 3: Practical Guide To Penetration Testing. Secure Planet LLC.</p>	

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Forshaw, J. (2017) Attacking Network Protocols. No Starch Press.
(**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)
<b>Engagement Requirements</b>
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: <a href="#">Academic engagement procedure</a>

### Supplemental Information

<b>Programme Board</b>	Computing
<b>Assessment Results (Pass/Fail)</b>	No
<b>Subject Panel</b>	Business & Applied Computing
<b>Moderator</b>	Qi Wang
<b>External Examiner</b>	N Coull
<b>Accreditation Details</b>	
<b>Version Number</b>	1.07

<b>Assessment: (also refer to Assessment Outcomes Grids below)</b>
Practical Examination (40%)
Coursework (60%)
(N.B. (i) <b>Assessment Outcomes Grids</b> 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 <b>indicative schedule</b> 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.)

<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>Weighting (%) of Assessment Element</b>	<b>Timetabled Contact Hours</b>	
Class test (practical)	✓		✓	40	2	
<b>Component 2</b>						

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Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Learning Outcome (3)	Weighting (%) of Assessment Element	Timetabled Contact Hours
Report of practical/ field/ clinical work	✓	✓	✓	60	8
<b>Combined Total For All Components</b>				100%	10 hours

Footnotes

A. Referred to within Assessment Section above

B. Identified in the Learning Outcome Section above

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. The assessment regime will be applied flexibly so that a student who can attain the practical outcomes of the module will not be disadvantaged. When a student discloses a disability, or if a tutor is concerned about a student, the tutor in consultation with the School Enabling Support co-ordinator will agree the appropriate adjustments to be made.

[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)