Session: 2024/25

Title of Module: Penetration Testing Programming			
Code: COMP11097	SCQF Level: 11 **(Scottish Credit and Qualifications Framework)**	Credit Points: 10	ECTS: 5 **(European Credit Transfer Scheme)**
School:	School of Computing, Engineering and Physical Sciences		
Module Co-ordinator:	Gerry Creechan		

Summary of Module
The module uses Python (or similar) to develop in students some of the skills required to develop programs to automate existing penetration testing techniques. The module introduces methods for analysing network traffic, manipulating data or logs obtained from online databases and websites,   This module develops a number of the key '**I am UWS' Graduate Attributes** to make those who complete this module: • **U**niversal   • Critical Thinker   • Ethically-minded   • Research-minded   • **W**ork Ready   • Problem-Solver   • Effective Communicator   • Ambitious   • **S**uccessful   • Autonomous   • Resilient   • Driven

Module Delivery Method					
Face-To-Face	Blended	Fully Online	HybridC	HybridO	Work-based Learning
	✓				

Face-To-Face
Term used to describe the traditional classroom environment where the students and the lecturer meet synchronously in the same room for the whole provision.
Blended
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
Fully Online
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.
HybridC
Online with mandatory face-to-face learning on Campus
HybridO
Online with optional face-to-face learning on Campus
Work-based Learning
Learning activities where the main location for the learning experience is in the workplace.

Campus(es) for Module Delivery						
The module will **normally** 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)
On successful completion of this module the student will be able to: L1. Systematically design and implement a programming solution to a problem relating to penetration testing. L2. Systematically design and implement an appropriate test strategy. L3. Produce appropriate supporting documentation, including justification of design decisions and implementation solutions made during the development of the program.

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 11. Students will learn systematic and comprehensive knowledge of Programming for 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 Programming for Penetration Testing, and apply this in planning, design and coding for penetration testing. 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, Accountability and Working with others	SCQF Level 11. Each student will generate a comprehensive report summarising his/her finding for a given scenario.	
Pre-requisites:	Before undertaking this module the student should have undertaken the following:	
	Module Code:	**Module Title:**
	Other:	
Co-requisites	**Module Code:**	**Module Title:**

* Indicates that module descriptor is not published.

Learning and Teaching
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.

Learning Activities During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:	**Student Learning Hours** (Normally totalling 200 hours): (Note: Learning hours include both contact hours and hours spent on other learning activities)
Lecture/Core Content Delivery	6
Tutorial/Synchronous Support Activity	6
Laboratory/Practical Demonstration/Workshop	12
Independent Study	76
	100 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: Forshaw, J. (2017) Attacking Network Protocols. No Starch Press.   Kim, P. (2018) The Hacker Playbook 3: Practical Guide To Penetration Testing. Secure Planet LLC.   Mohit. (2018) 2nd Ed. Python Penetration Testing Essentials: Techniques for ethical hacking with Python. Packt Publishing.

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Seitz, J. (2014) Black Hat Python: Python Programming for Hackers and Pentesters. 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)
Engagement Requirements
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: **Academic engagement procedure**

Supplemental Information

Programme Board	Computing
Assessment Results (Pass/Fail)	No
Subject Panel	Business & Applied Computing
Moderator	Sean Sturley
External Examiner	N Coull
Accreditation Details	
Version Number	1.04

Assessment: (also refer to Assessment Outcomes Grids below)
Coursework (100%)
(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 Handbook.)

Assessment Outcome Grids (Footnote A.)

Component 1

Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Learning Outcome (3)	Weighting (%) of Assessment Element	Timetabled Contact Hours	
Clinical/ Fieldwork/ Practical skills assessment/ Debate/	✓	✓	✓	100	0	

Interview/ Viva voce/ Oral						
Combined Total For All Components				100%	0 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)