Module Descriptor

Title	DevOps		
Session	2025/26	**Status**	Published
Code	COMP09119	**SCQF Level**	9
Credit Points	20	**ECTS (European Credit Transfer Scheme)**	10
School	**Computing, Engineering and Physical Sciences**		
Module Co-ordinator	Jacob Koenig		

Summary of Module

Considering recent advances in modern software delivery, this module will concentrate on the software engineering approach that integrates software development (Dev) and operations (Ops). This approach streamlines the software development lifecycle, allowing for enhanced efficiency and responsiveness to user needs and market demands.

It will focus on the theoretical and practical aspects of DevOps, and help students understand the core ideas of modern software development and deployment workflows and allow them to configure and implement a DevOps pipeline.

The syllabus of the module will cover:

- DevOps Overview:
  - Understanding the DevOps Lifecycle: Evolution, Roots, and Modern Practices
  - Core DevOps Principles: Full Lifecycle Involvement, Systems Thinking, Continuous Improvement
  - Addressing Cultural Challenges: Collaboration, Team Dynamics, Automation Culture
- Continuous Integration and Continuous Delivery (CI/CD):
  - (Automated) Configuration Management
  - Version Control Systems
  - Principles and Practices of CI/CD Pipelines
  - Infrastructure as Code (IaC) in CI/CD Pipelines
  - Containerisation Principles and Benefits
  - Orchestration and Management Tools
  - CI/CD Pipeline Planning, Building, Deploying, and Monitoring
- Testing:
  - Overview of Testing in DevOps
  - Testing APIs, Code Analysis, and Code Smells
  - Automated Testing Strategies
- Security (DevSecOps):
  - Introduction to DevSecOps

- Integrating Security into CI/CD Pipelines

- Operations and Monitoring:

  - Infrastructure Management and Monitoring

  - Continuous Monitoring and Incident Response

  - Performance Optimisation and Scalability

This module will work to develop a number of the key 'I am UWS' Graduate Attributes to make those who complete this module:

- Universal: critical thinker; ethically-minded; and research-minded

- Work Ready: problem-solver; digitally literate; effective communicator; and ambitious

- Successful: autonomous; resilient; and transformational

Module Delivery Method	**On-Campus[1]** ☒	**Hybrid[2]** ☐	**Online[3]** ☒	**Work -Based Learning[4]** ☐
Campuses for Module Delivery	☐ Ayr ☐ Dumfries	☒ Lanarkshire ☐ London ☒ Paisley	☐ Online / Distance Learning ☒ Other (specify) Online Delivery / Distance Learning applies to delivery in the BSc (Hons) Data, AI and Software Engineering Programme only	

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	Discuss the benefits and usage of DevOps principles and concepts in comparison to traditional approaches

[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

L2	Demonstrate an understanding of version control, containerisation, and continuous integration by implementing a basic DevOps workflow using relevant tools.
L3	Design and implement an automated CI/CD pipeline including testing and deployment stages for delivery of a software component.
L4	Demonstrate a detailed understanding of Configuration Management, Security, Monitoring and Operations in a DevOps context including the use of relevant software tools.
L5	Evaluate a DevOps workflow by assessing efficiency, reliability, and performance.

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 an understanding of the theoretical and technical approaches that underpin DevOps.
Practice: Applied Knowledge and Understanding	**SCQF 9** Use a range of routine skills, techniques and practices to design and implement DevOps principles and concepts
Generic Cognitive skills	**SCQF 9** Bring together information from a variety of sources, including academic and industrial technical publications
Communication, ICT and Numeracy Skills	**SCQF 9** Use a range of ICT tools to implement and maintain a CI/CD pipeline.
Autonomy, Accountability and Working with Others	**SCQF 9** Exercise initiative and self-management in the completion of the module coursework

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.	
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	24
Independent Study	152
Please select	
Please select	
Please select	
TOTAL	200

Indicative Resources
The following materials form essential underpinning for the module content and ultimately for the learning outcomes: Gene Kim, Patrick Debois, John Willis, and Jez Humble. (2016). The DevOps Handbook: How to Create World-Class Agility, Reliability, and Security in Technology Organizations. IT Revolution Press. Mikael Krief (2022). Learning DevOps. 2nd edn. Packt Publishing
(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	**Computing**
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	Business & Applied Computing
Moderator	Pablo Salva-Garcia
External Examiner	TBC
Accreditation Details	
Module Appears in CPD catalogue	☐ **Yes** ☒ **No**
Changes / Version Number	1.02

Assessment (also refer to Assessment Outcomes Grids below)
Assessment 1
Practical DevOps assessment with a written component (40%)
Assessment 2
Practical assignment via developing a CI/CD pipeline with a written component. (60%)
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**
Portfolio of Practical Work	☒	☒	☐	☐	☐	40	

Component 2							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
Portfolio of Practical Work	☐	☐	☒	☒	☒	60	

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
Attendance and Engagement and Equality and Diversity Statements	21/01/25	R Moffat
Guidance Note 23-24 provided and general housekeeping to text across sections.	12/12/23	D Taylor
Updated Student Attendance and Engagement Procedure and updated UWS Equality, Diversity and Human Rights Code	19/10/23	C Winter
Updated contact hours	14/09/21	H McLean