Module Descriptor

Title	Cloud Services and Architectures		
Session	2025/26	**Status**	Published
Code	COMP09120	**SCQF Level**	9
Credit Points	20	**ECTS (European Credit Transfer Scheme)**	10
School	**Computing, Engineering and Physical Sciences**		
Module Co-ordinator	Dr Pablo Salva-Garcia		

Summary of Module

This module provides a comprehensive understanding of cloud services, architectures, and advanced cloud-native principles. Students will gain an understanding of cloud service models, cloud-native design principles, infrastructure components, architecture patterns, security, and communication protocols across multiple cloud platforms.

The syllabus will cover:

- Introduction to Cloud Services and Architectures
  - Overview of cloud service models: IaaS, PaaS, SaaS.
  - Introduction to cloud-native design principles, elements, benefits, and services.

- Cloud Infrastructure
  - Components and layers of cloud infrastructure offered by different cloud providers.
  - Role of cloud infrastructure in supporting cloud services.

- Cloud Native Architecture and Patterns
  - Overview of cloud-native architecture principles.
  - Microservices architecture, event-driven architecture, serverless computing.

- Cloud Native Data and Data Governance
  - Management of data in cloud-native environments.
  - Principles of data governance in the cloud.

- Security in the Cloud
  - Fundamentals of cloud security.
  - Best practices for securing cloud environments.

- Communication in Cloud Environments
  - Communication patterns and protocols in cloud architectures.
  - Technologies and tools

- LSEP issues in Cloud Computing
  - Data privacy and governance in cloud settings
  - Environmental impact of cloud computing
  - Vendor lock-in
  - Cloud certifications

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

- Universal: Socially Responsible; Analytical; and Collaborative
- Work-Ready: Digitally literate; Motivated; and Enterprising
- Successful: Innovative; 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 Delvery / Distance Learning applies to delivery in the BSc (Hons) IT Software Development 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	☐

[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

Learning Outcomes	
L1	Demonstrate a detailed understanding of fundamental and advanced concepts of cloud services, architectures, and service models
L2	Demonstrate an understanding of current issues, benefits, and drawbacks of using cloud services.
L3	Develop and deploy a cloud-native application using an appropriate architecture for a given problem.
L4	Critically evaluate effective data management techniques, communication patterns and security measures in cloud-native environments.
L5	N/A

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** A critical understanding of a range of the principles, principal theories, concepts and terminology within the domain of cloud services and cloud computing
Practice: Applied Knowledge and Understanding	**SCQF 9** Use skills, techniques and practice to develop a cloud native software application
Generic Cognitive skills	**SCQF 9** Identify and analyse routine professional problems and issues associated with the use of cloud services.
Communication, ICT and Numeracy Skills	**SCQF 9** Use a range of routine skills and some advanced and specialised skills in selecting a cloud provision, a suitable architecture and designing and implementing a cloud-native software applicationExercise autonomy and initiative in undertaking the necessary activities for the module's coursework.
Autonomy, Accountability and Working with Others	**SCQF 9** Exercise autonomy and initiative in undertaking the necessary activities for the module's 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:

- Goniwada, S.R. (2021) CLOUD NATIVE ARCHITECTURE AND DESIGN : a handbook for modern day architecture and design with enterprise-grade examples. S.L.: Apress.
- Kasun Indrasiri and Sriskandarajah Suhothayan (2021) Design Patterns for Cloud Native Applications. 'O'Reilly Media, Inc.'
- Scholl, B., Swanson, T. and Jausovec, P. (2019) Cloud Native. O'Reilly Media.
- Poulton, N. (2023) The Kubernetes Book: 2024 Edition. Nielsen Book Services.

(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	Dr Jacob Koenig
External Examiner	A Jindal
Accreditation Details	
Module Appears in CPD catalogue	☐ **Yes** ☒ **No**
Changes / Version Number	1.02

Assessment (also refer to Assessment Outcomes Grids below)
Assessment 1
A written report based on a given scenario or case study that selects and analyses suitable cloud services, architectures, and service models, while also discussing current issues, benefits, and drawbacks associated with using cloud services in the provided scenario. (50%)
Assessment 2
A practical coursework that consists of a development exercise for students to create a cloud-native application. (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
Review/Article/ Critique/Paper	☒	☒	☐	☒	☐	50	

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

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