Module Descriptor

Title	Introduction to Network and Cloud Computing		
Session	2025/26	**Status**	Published
Code	COMP08014	**SCQF Level**	8
Credit Points	20	**ECTS (European Credit Transfer Scheme)**	10
School	**Computing, Engineering and Physical Sciences**		
Module Co-ordinator	Aboua Ange Kevin N'DA		

Summary of Module

This module provides students with a fundamental introduction to computer networks and the theme of cloud computing, where varying levels of computing resources are available via the internet. Computer networks are the underlying infrastructure of the internet, enabling communication and resource sharing among interconnected devices, while cloud computing represents a paradigm shift in the delivery and consumption of computing resources, offering scalability, flexibility, and accessibility on-demand.

This is fundamental knowledge to students studying computing and software courses as it forms the backbone of modern IT infrastructure and services. Understanding computer networks and cloud computing is essential for students pursuing careers in various computing fields, including software development, system administration, cybersecurity, and data science.

The syllabus will include the following:

Computer Networks:

- Overview of Network Devices including Switch, Router and Firewall
- Types of Networks: Local Area Networks (LAN), Wide Area Networks (WAN), Internet, Wireless
- Network Layers and Protocols: OSI Model and the TCP/IP Suite

o Physical layer: components and structure, Mac addresses

o Data link layer: Frames, VLAN, ARP

o Network layer: Packets and protocols such as IP (v4 and v6), paths, subnetting, IPsec, NAT

o Transport layer: TCP, UDP

o Session, presentation, and application layers: key terminology (sockets, ports) and protocols: SSL, SSH, FTP, HTTP(s), FTP, DHCP, DNS

- Network Security Fundamentals: encryption, firewall types and role, DMZ, proxy servers

Cloud Computing:

- Overview: Definition, introduction, and rationale of cloud computing
- Characteristics: scalability, reliability, elasticity, cost-efficiency
- The role of cloud computing in modern businesses
- Virtualization definition and types (server, network, desktop, storage, application)
- Cloud service models (SaaS, PaaS, SaaS, IaaS) and deployment models
- Security and Privacy in the Cloud: Identity and access management (IAM), data encryption and privacy, governance
- Exploration of modern cloud provisions (Azure, AWS, Google Cloud) and their offered services

Sample tasks that students will undertake in the practical classes in this module are the design of a simple computer network and the configuration, hardening and deployment of a local and cloud-based server.

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

- Universal: collaborative; ethically-minded; and inquiring
- Work Ready: influential; digitally literate; effective communicator; and enterprising
- Successful: innovate; creating; and transformationa

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	☐

[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

Long-thin Delivery over more than one Term	Term 1 – Term 2	☐	Term 2 – Term 3	☐	Term 3 – Term 1	☐

Learning Outcomes	
L1	Demonstrate a broad understanding of the key terminology, components and principles that make up computer networks
L2	Demonstrate a broad understanding of cloud computing and virtualization including the key concepts and benefits
L3	Analyse and compare the security and privacy considerations inherent in cloud computing and computer network applications, and demonstrate their practical implementation in designing secure and privacy-respecting systems
L4	Apply appropriate virtualization techniques to configure a computer system for virtualization and deploy and test the virtualized system to a cloud environment effectively
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 8** Understand the key components and layers of computer networks including the OSI and TCP/IP model and associated technologies and protocols Knowledge and understanding of the reason for using cloud computing, its benefits and service as well as deployment models Knowledge and understanding of virtualization of computer systems
Practice: Applied Knowledge and Understanding	**SCQF 8** Using a range of professional skills, techniques, and practices to virtualize a computer system and deploy it to a suitable cloud platform Using a range of materials to design a simple computer network Carry out a routine investigation into cloud security and privacy
Generic Cognitive skills	**SCQF 8** Undertake critical analysis to choose a suitable cloud provision
Communication, ICT and Numeracy Skills	**SCQF 8** Use a range of standard ICT applications to process and obtain data. Report writing and presentation skills
Autonomy, Accountability and Working with Others	**SCQF 8** Manage resources within defined areas of work in completing the assignments

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. 48	
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	12
Tutorial / Synchronous Support Activity	12
Laboratory / Practical Demonstration / Workshop	24
Independent Study	152
Please select	
Please select	
TOTAL	

Indicative Resources
The following materials form essential underpinning for the module content and ultimately for the learning outcomes: Erl, T., Puttini, R. and Mahmood, Z. (2023) Cloud computing : concepts, technology, & architecture. Upper Saddle River, Nj: Prentice Hall. Kurose, J.F. and Ross, K.W. (2017) Computer networking : a top-down approach. 7th edn. Boston, Mass.: Pearson.
(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	Rebecca Redden
External Examiner	TBC
Accreditation Details	N/A
Module Appears in CPD catalogue	☐ **Yes** ☒ **No**
Changes / Version Number	1.1

Assessment (also refer to Assessment Outcomes Grids below)
Assessment 1
Class Test (written) A written class test that covers the key concepts in network and cloud computing. (40%)
Assessment 2
A logbook/workbook outlining the steps taken in setting up, securing, and deploying a computer system to the cloud. (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**
Class Test (Written)	☒	☒	☐	☐	☐	40	2

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

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 EDI updates	17/01/2025	L Cunningham
Assignment of module coordinator & moderator. Update of CPD and Module Eligible for Compensation.	21/02/2025	Aboua Ange Kevin N'DA