Prifysgol Wrecsam
Wrexham University

Module specification

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Module Code	CONL715
Module Title	Virtual and Cloud Computing
Level	7
Credit value	15
Faculty	FACE
HECoS Code	100365
Cost Code	GACP

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
MSc Computer Science with Big Data Analytics	Core
MSc Computer Science	Core
MSc Computer Science with Software Engineering	Core

Pre-requisites

None

Breakdown of module hours

Learning and teaching hours	15 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	0 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
Total active learning and teaching hours	**15** hrs
Placement / work based learning	0 hrs
Guided independent study	135 hrs
Module duration (total hours)	150 hrs

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Initial approval date	04/09/2019
With effect from date	01/01/2020

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Date and details of revision	27/06/2024 Programme revalidation 01/11/2024 Admin correction of assessment 1 from in-class test to coursework
Version number	3

Module aims

This module aims at helping the students develop and comprehensive and systematic understanding of modern cloud computing. The module will introduce students to the concepts of virtualisation and cloud computing, including the networking principles, algorithms, cloud infrastructure components and technologies that are used within the architecture of the internet. By the end of this module, students will be able to describe the architecture of modern distributed computing and explain how networks interact with operating systems and applications to provide cloud infrastructure. This includes explaining the different devices, software and protocols used within online environments, selecting approaches appropriate to the network stack level, and justifying the choices made in implementing physical and logical networks.

Module Learning Outcomes - at the end of this module, students will be able to:

1	Develop the ability to select, utilize, and adapt virtual and cloud computing technologies effectively.
2	Critically evaluate the appropriateness of virtual and cloud networking products for different applications.
3	Develop, justify and document strategies for planning and implementing virtual and cloud solutions, dealing with networking problems in real time.
4	Synthesise complex information sources and models to produce solutions to complex network problems, judging their suitability.
5	Critically Reflect upon the selection of appropriate networking technologies for solving complex requirements.

Assessment

This section outlines the type of assessment task the student will be expected to complete as part of the module. More details will be made available in the relevant academic year module handbook.

Indicative Assessment Tasks:

This module will be assessed in the form of two summative assessment which evaluate both theory and application of virtual and cloud computing concepts. The first coursework will focus on the application of virtual and cloud computing technologies, with students documenting their understanding of concepts and their application in networking scenarios. This will be followed at the end of the module by a report analysing a virtual and cloud computing case study, selecting and justifying appropriate solutions for simulated situation.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)

1	1, 2, 4, 5	Coursework	40%
2	2, 3, 4, 5	Coursework	60%

Derogations

None

Learning and Teaching Strategies

The overall learning and teaching strategy is one of guided independent study requiring ongoing student engagement. Online material will provide the foundation of the learning resources, requiring the students to log in and engage regularly throughout the eight weeks of the module. There will be a mix of suggested readings, discussions and video content containing embedded digital content and self-checks for students to complete as they work through the material and undertake the assessment tasks. The use of a range of digital tools via the virtual learning environment together with additional sources of reading will also be utilised to accommodate learning styles. There is access to a helpline for additional support and chat facilities through Canvas for messaging and responding.

Indicative Syllabus Outline

- Introduction to modern networking
- Machine virtualisation
- Network virtualisation
- Software defined networks
- Internet of Things
- Network design for quality of service (QoS)
- Quality of experience (QoE)

Indicative Bibliography:

Please note the essential reads and other indicative reading are subject to annual review and update. Please *ensure correct referencing format is being followed as per University*

Essential Reading

K. Jamsa, *Cloud Computing,* 2nd ed. Burlington, MA: Jones and Bartlett Publishers, 2022.

Other indicative reading

W. Stallings, *Foundations of modern networking: SDN, NFV, QoE, IoT, and Cloud*, Boston, MA: Addison-Wesley Professional, 2015.

N.B. Ruparelia, *Cloud Computing,* Cambridge, MA: The MIT Press, 2023.

W. Stallings, *Data and Computer Communications,* 10th ed. *London:* Pearson, 2015.