MODULE SPECIFICATION

Module Code:	CONL715

Module Title:	Virtual and Cloud Computing

Level:	7	**Credit Value:**	15

Cost Centre(s):	GACP	JACS3 **code**: HECoS code:	I120 100365

Faculty:	FAST	**Module Leader:**	Nigel Houlden

Scheduled learning and teaching hours	15 hrs
Guided independent study	135 hrs
Placement	0 hrs
Module duration (total hours)	150 hrs

Programme(s) in which to be offered (not including exit awards)	Core	Option
MSc Computer Science (online)	✓	☐
MSc Computer Science with Big Data Analytics	✓	☐
MSc Computer Science with Cyber Security	✓	☐
MSc Computer Science with Networking	✓	☐
MSc Computer Science with Software Engineering	✓	☐

Pre-requisites
Studied CONL701 Critical Research for Postgraduate Study

Office use only
Initial approval: 04/09/2019 Version no:1
With effect from: 01/01/2020
Date and details of revision: Version no:

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Module Aims
This module will introduce students to the concepts of virtualisation and cloud computing, including the networking principles, algorithms and technologies that are used within the architecture of the Internet. By the end of this module, students will be able to explain the different devices, software and protocols used within online environments, select approaches appropriate to the network stack level and justify the choices made implementing physical and logical networks.

Intended Learning Outcomes

Key skills for employability

KS1	Written, oral and media communication skills
KS2	Leadership, team working and networking skills
KS3	Opportunity, creativity and problem solving skills
KS4	Information technology skills and digital literacy
KS5	Information management skills
KS6	Research skills
KS7	Intercultural and sustainability skills
KS8	Career management skills
KS9	Learning to learn (managing personal and professional development, self-management)
KS10	Numeracy

	At the end of this module, students will be able to	Key Skills	
1	Select, use and adapt virtual and cloud computing technologies.	KS2	KS3
		KS4	KS5
		KS6	KS7
2	Critically evaluate the appropriateness of virtual and cloud networking products for different applications.	KS1	KS5
		KS6	
3	Develop, justify and document strategies for planning and implementing virtual and cloud solutions, dealing with networking problems in real time.	KS2	KS3
		KS4	KS10
4	Synthesise complex information sources and models to produce solutions to complex network problems, judging their suitability.	KS1	KS5
		KS9	
5	Reflect upon the selection of appropriate networking technologies for solving complex requirements.	KS1	KS6
		KS8	KS9

Transferable skills and other attributes
Analysis and design skills Critical thinking and evaluation Organisation and time management

Derogations
None

Assessment:

Indicative Assessment Tasks:

The first two elements of coursework will focus on the application of virtual and cloud computing technologies, with students documenting their approach to solving networking problems. These 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 (%)	Duration or Word count (or equivalent if appropriate)
1	1	Coursework	25%	750 words
2	2,3	Coursework	25%	750 words
3	4,5	Report	50%	1,500 words

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 login and engage on a regular basis throughout the eight-week period of the module. There will be a mix of suggested readings, discussions and interactive content containing embedded digital media and self-checks for students to complete as they work through the material and undertake the assessment tasks. The use of a range 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.

Syllabus outline:

1. Introduction to modern networking
2. Software defined networks
3. Machine virtualisation
4. Network virtualisation
5. Network design for quality of service and quality of experience
6. Cloud computing
7. The Internet of Things (IoT)

Indicative Bibliography:

Essential reading

Stallings, W (2013) Data and Computer Communications. 10th Ed. Pearson.

Other indicative reading

Comer, D.E. and Droms, R.E. (2014) *Computer Networks and Internets.* 6th ed. Boston: Pearson

Dye, M., McDonald R. and Rufi, A. (2008) *Network Fundamental: CCNA Exploration Companion Guide*. Cisco Press.

Fitzgerald, J. (2014) *Business, Data Communications and Networking.* 12th ed. Hoboken, NJ: Wiley.

Forouzan, B.A. (2012) *Data Communications Science.* 5th ed. New York: McGraw-Hill

Gralla, P. (2006) *How the Internet Works.* 8th ed. Indianapolis, IN: Que.

Graziani, R. and Johnson, A. (2012) *Routing Protocols and Concepts. CCNA Exploration Companion Guide.* Cisco Press.

Odom, W. (2016) *CCNA Routing and Switching 200-125 Official Cert Guide.* Indianapolis: Ciscopress.

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