MODULE SPECIFICATION PROFORMA

Module Code:	COM739

Module Title:	Network Hardware and Software

Level:	7	**Credit Value:**	20

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

Faculty:	Arts, Science and Technology	**Module Leader:**	Nigel Houlden

Scheduled learning and teaching hours	21 hrs
Guided independent study	179 hrs
Placement	0 hrs
Module duration (total hours)	200 hrs

Programme(s) in which to be offered (not including exit awards)	Core	Option
MSc Computer Networking	✓	☐
MSc Computer Science	✓	☐
MSc Computing	✓	☐

Pre-requisites
None

Office use only
Initial approval: 28/11/2018 Version no:1
With effect from: 01/09/2019
Date and details of revision: Version no:

Module Aims

This module will provide an introduction to essential Networking terminology, standards and protocols, local-area networks (LANs), wide-area networks (WANs) and the Open Systems Interconnection (OSI) and TCP/IP models. It will develop a practical working knowledge of Networking tools and Networking hardware and software including hubs, switches and routers – and their configuration - and (OSI) layer 2 and 3 topologies and addressing formats including IPv6. In addition to this experience, students will be required to reflect upon the benefits that will be possible from a technical introduction to the subject and the extra achievement necessary to make the transition to practical Networking and the workplace. They will be required to undertake additional, directed, research to establish the extent of this 'skills gap'.

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	Demonstrate competence in the use of Networking hardware and software in both theory and practice	KS2	KS3
		KS4	KS5
		KS6	KS7
2	Compare and contrast available Networking hardware and software products for different applications.	KS1	KS5
		KS6	
3	Develop strategies for planning and implementing Networking solutions or dealing with Networking problems in real time.	KS2	KS3
		KS4	KS10
4	Synthesise Networking solutions from complex information sources and models and judge their suitability.	KS1	KS5
		KS9	
5	Reflect upon the difference between the theory of Networking and the practical requirements of the workplace.	KS1	KS6
		KS8	KS9

Transferable skills and other attributes

Derogations

None.

Assessment:

Indicative Assessment Tasks:

Students will be assessed using a combination of theory and practical tests and an assignment in which they are required to reflect upon the benefits that will be possible from a technical introduction to the subject and the extra achievement necessary to make the transition to practical Science and the workplace. They will be required to undertake additional, directed, research to establish the extent of this 'skills gap'

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)	Duration (if exam)	Word count (or equivalent if appropriate)
1	2	In-class test	20	2.5 hours	
2	1,3,4	Practical	30	2 hours	
3	5	Coursework	50		2000

Learning and Teaching Strategies:

The module will be delivered through a mixture of lectures, tutorials and directed private study.

Students will also disseminate and discuss information through student-led seminars, peer group discussion and technical presentations.

Syllabus outline:

Exploring the Network
Configuring a Network Operating System
Network Protocols and Communications
Network Access
Ethernet

Network Layer
Transport Layer
IP Addressing (IPv4 and IPv6)
Sub-netting IP Networks
Application Layer
Introduction to Switched Networks
Basic Switching Concepts and Configuration
VLANs
Routing Concepts
Inter-VLAN Routing
Static Routing
Routing Dynamically
Single-Area OSPF
Access Control Lists
DHCP
Network Address Translation for IPv4

Indicative Bibliography:

Essential reading

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

Other indicative reading

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

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

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.

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

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