Module Code:	COM741

Module Title:	Network Techniques and Technologies

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 Science	✓	☐
MSc Computer Networking	✓	☐
MSc Computing	✓	☐

Pre-requisites
None

Module Aims
This module introduces students to more advanced addressing techniques, such as CIDR/VLSM, NAT/PAT and DHCP as well as basic routing protocols. It provides students with the opportunity to work with network management tools, switch configuration, Virtual LANs and trunking and WAN technologies such as PPP, Frame Relay and xDSL. In addition to this experience, students will be required to undertake a practical group design exercise in the form of a real-world case study. This will involve synthesising (often contradictory) information from different sources and balancing network features against cost in a constrained environment.

Intended Learning Outcomes
At the end of this module, students will be able to: 1. configure network switches and routers for a variety of complex roles   2. design and manage network solutions for complex scenarios   3. make appropriate judgements as to the suitability of different remote access technologies   4. implement and evaluate new and emerging LAN and WAN technologies   5. balance networking requirements against cost constraints in the real world   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	Configure network switches and routers for a variety of complex roles.	KS2	KS4
		KS5	
		KS7	
2	Design and manage network solutions for complex scenarios Make appropriate judgements as to the suitability of different remote access technologies.	KS1	KS10
		KS3	
		KS6	
3	Implement and evaluate new and emerging LAN and WAN technologies.	KS3	
		KS2	
4	Balance networking requirements against cost constraints in the real world.	KS9	KS8
		KS6	

Transferable skills and other attributes

Derogations

None

Assessment:

Indicative Assessment Tasks:

Students will be assessed using a combination of theory and practical tests (50%) 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	1,3	In-class test	20	2.5 hours	
2	1,4	Practical	30	2 hours	
3	2,3,5	Coursework	50		2000

Learning and Teaching Strategies:

The module will be delivered through a mixture of:
- lectures, tutorials and seminars
- e-learning material supporting a full blended-learning environment including interactive formative assessment
- practical networking sessions in a fully-equipped and state-of-the-art networking laboratory

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

Syllabus outline:

LAN Design
Scaling VLANs
STP
Etherchannel and HSRP
Dynamic Routing
EIGRP
EIGRP Tuning and Troubleshooting

Single-Area OSPF
Multiarea OSPF
OSPF Tuning and Troubleshooting
WAN Concepts
Point-to-Point Connections
Branch Connections
Access Control Lists
Network Security and Monitoring
Quality of Service
Network Evolution
Network Troubleshooting

Indicative Bibliography:

Essential reading

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

Other indicative reading

Lammle, T. (2016), *CCNA Routing and Switching Complete Study Guide*: *Exam 100-105, Exam 200-105, Exam 200-125.* 2nd ed. Wiley.