

Liverpool John Moores University

Title: NETWORK AND COMMUNICATIONS MANAGEMENT
Status: Definitive
Code: **6507CP** (103591)
Version Start Date: 01-08-2013

Owning School/Faculty: Arts, Professional and Social Studies
Teaching School/Faculty: Dublin Business School

Team	Leader
Alistair Beere	Y

Academic Level: FHEQ6
Credit Value: 24.00
Total Delivered Hours: 77.00
Total Learning Hours: 240
Private Study: 163

Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	25.000
Practical	25.000
Tutorial	25.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Essay	AS1	Continuous Assessment	50.0	
Exam	AS2	Examination	50.0	2.00

Aims

To enhance the learners' prior knowledge of computer networking, basic elements of networks and network types.

To equip learners with in-depth knowledge on relevant data communication models.

To give learners the knowledge to examine in-detail the role of switching in modern networks.

To support learners to gain an in-depth understanding of routers, routing tables and

*routing protocols and be able to develop a suitable IP Plan.
 To equip learners with an understanding of WAN technologies.
 To allow learners to gain a practical understanding of network construction and ancillary troubleshooting issues.*

Learning Outcomes

After completing the module the student should be able to:

- 1 Employ practical fundamental networking concepts and technologies.
- 2 Identify and relate knowledge of the OSI and TCP/IP data communication models.
- 3 Design, configure and manage a small-scale switched network.
- 4 Critique the operations and functions of a router and its critical role within networking.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

CONTINUOUS	1	2	3	4
ASSESSMENT				
EXAM	1	2	3	4

Outline Syllabus

- 1. Introduction to Networking: Networking concepts, network topologies and operation of a data communications network. Differentiation between LAN, MAN and WAN. The OSI reference model and TCP/IP protocol stack.*
- 2. Physical Devices and Media: Signal representation, bandwidth concepts. Transmission media (guided and unguided). Bridges, Repeaters, Hubs, Switches and Routers.*
- 3. Network Addressing, Devices and media. Port, logical and physical addressing. Communications overview incorporating devices operating at different layers of the data communication model.*
- 4. Ethernet LAN: Frames and collision/broadcast domains. Data link Layer Switch operation, Advanced Ethernet Switch Operation, Switch management, operation and security. STP and convergence. VLANS, Inter VLAN routing, configuration and troubleshooting of same.*
- 5. Logical Addressing: IP Addressing, IPv4 & IPv6. Planning an IP network. Ipv4 to IPv6 migration issues. How routers process packets, IPv6 Stack, configuration options, extension headers, IPv6 Addressing. Binary, decimal and hex numbering systems and CIDR & VLSM Subnetting.*
- 6. Transport Layer Protocols: Reliability in TCP/IP, connection orientated versus connectionless protocols, TCP 3 way handshake, acknowledgements and flow control versus best effort transport.*
- 7. Routing: Routing & Packet Forwarding, path determination. Static and Dynamic routes. Distance Vector Routing Protocols, RIPv1 & RIPv2, & EIGRP. Link State Routing Protocols; OSPF, OSPF metric calculations. Verifying and troubleshooting Link and Distance*

Vector Routing Protocols. Autonomous Systems, BGP, scalability and instability.

8. Introduction to QoS. Quality of Service Techniques; 802.1p; Exploration of the effects of delay, from jitter to delay, to sources of delay.

9. Wireless Technologies: Wireless LANs & WLAN Standards, Radio Bands, Bandwidth, Spread Spectrum Transmission, 802.11x operation, 802.11x transmission standards, 802.11x WLAN Security. Wireless as an Infrastructure, Wi-Max, FWA. Wireless Networking planning, channel reuse.

10. WAN Technologies: Wide Area Networks (WANs) and the telephone system, Layer 1 (leased lines), Layer 2 (PSDN), Frame relay, ATM, MAN, Layer 3 IP WAN Services, MPLS, LLU. Metro Ethernet.

Learning Activities

Lectures, tutorials and practicals.

References

Course Material	Book
Author	Tanenbaum, A.S. & Wetherall, D. J.
Publishing Year	2011
Title	Computer Networks
Subtitle	
Edition	5th
Publisher	Pearson
ISBN	

Course Material	Book
Author	Kurose & Ross
Publishing Year	2012
Title	Computer Networking
Subtitle	A Top Down Approach
Edition	6th
Publisher	Pearson
ISBN	

Course Material	Book
Author	Mansfield N.
Publishing Year	2011
Title	Practical TCP/IP
Subtitle	Designing, Using & Troubleshooting TCP/IP Networks on Linux and Windows
Edition	2nd
Publisher	UIT
ISBN	

Course Material	Book
------------------------	------

Author	Odom, W.
Publishing Year	2011
Title	CCNA 640-802 Official Cert Library
Subtitle	
Edition	3rd
Publisher	Cisco Press
ISBN	

Notes

This module will provide a key understanding of the fundamentals of computer networks. The module will then progress to generate skills based on the practical application of this knowledge through hands on assignments which will develop real world skills. On completion learners will have an in-depth understanding of how local area networks and the Internet work. This is a highly practical module that will allow learners to design, construct, maintain and troubleshoot a medium size organisation's network.