

## H06DCN: Data Communications and Networking

Module Code:	H06DCN
Long Title	Data Communications and Networking <b>APPROVED</b>
Title	Data Communications and Networking
Module Level:	LEVEL 6
EQF Level:	5
EHEA Level:	Short Cycle
Credits:	5
Module Coordinator:	PAUL HAYES
Module Author:	PAUL HAYES
Departments:	School of Computing
Specifications of the qualifications and experience required of staff	
<b>Learning Outcomes</b>	
<i>On successful completion of this module the learner will be able to:</i>	
<b>#</b>	<b>Learning Outcome Description</b>
LO1	Explain the theory, concepts and principles of data communications
LO2	Define terms used in data communications and networking
LO3	Identify and describe the types and uses of networks and data communications technology issues, including the use of cryptography
LO4	Transfer and apply theoretical concepts to problem solving in a range of data communications and networking contexts in the 'real world'
LO5	Illustrate the functions of the TCP/IP layers and their application to the Internet
LO6	Identify current and future data communications and networking trends
<b>Dependencies</b>	
<b>Module Recommendations</b>	
No recommendations listed	
<b>Co-requisite Modules</b>	
No Co-requisite modules listed	
<b>Entry requirements</b>	

# H06DCN: Data Communications and Networking

Module Content & Assessment			
Indicative Content			
<b>Introduction to Data Communication</b> • Data Communication. • Data versus Information. • Centralised and Distributed Processing. • Client-Server and Cloud Computing. • Network criteria. • Physical structures. • Categories of networks. • The Internet Protocols and standards • Emergent technologies/languages			
<b>Network Models</b> • Layered architecture. • Encapsulation Peer-to-peer processes. • The OSI model. • Layers in the OSI model TCP/IP protocol suite TCP/IP versions			
<b>Digital and Analog Transmission</b> • Analog and digital signals. • Bandwidth Transmission Impairment. • Analog-to-digital conversion. • Transmission Mode			
<b>Multiplexing and Switching</b> • Frequency-division multiplexing. • Time-division multiplexing. • Wavelength-division multiplexing. • Circuit switching. • Packet switching. • Datagram approach Virtual circuit approach			
<b>Transmission Media</b> • Characteristics of Guided media Twisted-Pair cable Co-axial Cable Fibre-optic cable Characteristics of Unguided media Radio waves Microwaves Infrared			
<b>Local Area Networks</b> • Multiple Access Protocols. • Traditional Ethernet CSMA/CD. • Switched Ethernet. • Fast Ethernet • Gigabit Ethernet • Wireless LAN • CSMA/CA			
<b>Connecting LANs and Backbone Networks</b> • Repeater • Hub • Switch • Router • Backbone networks			
<b>TCP/IP Network and Transport Layer</b> • IP Addressing • Internetworking • Transition from IPv4 to IPv6 • Address Mapping • ICMP and IGMP • UDP and TCP • Application Layer			
<b>Cryptography</b> • Principles of Cryptography • Symmetric Key Cryptography • Public Key Encryption • RSA • Digital Signatures			
Assessment Breakdown			%
Coursework			40.00%
End of Module Assessment			60.00%
Assessments			
Full Time			
Coursework			
<b>Assessment Type:</b>	CA 1 (0380)	<b>% of total:</b>	20
<b>Assessment Date:</b>	Week 6	<b>Outcome addressed:</b>	1,2,3,4,5,6
<b>Non-Marked:</b>	No		
<b>Assessment Description:</b> Students may be assessed through continuous assessment, including a mid-term test, that contain a number of questions which examine the student's ability to explain the theory, concepts and principles of data communications.			
<b>Assessment Type:</b>	CA 2 (0390)	<b>% of total:</b>	20
<b>Assessment Date:</b>	Week 12	<b>Outcome addressed:</b>	1,2,3,4,5,6
<b>Non-Marked:</b>	No		
<b>Assessment Description:</b> Students may be assessed through continuous assessment, including a mid-term test, that contain a number of questions which examine the student's ability to explain the theory, concepts and principles of data communications.			
End of Module Assessment			
<b>Assessment Type:</b>	Terminal Exam	<b>% of total:</b>	60
<b>Assessment Date:</b>	End-of-Semester	<b>Outcome addressed:</b>	1,2,3,4,5,6
<b>Non-Marked:</b>	No		
<b>Assessment Description:</b> End-of-Semester Final Examination			
No Workplace Assessment			
Reassessment Requirement			
<b>Repeat examination</b> <i>Reassessment of this module will consist of a repeat examination. It is possible that there will also be a requirement to be reassessed in a coursework element.</i>			

## H06DCN: Data Communications and Networking

Module Workload				
Module Target Workload Hours 0 Hours				
Workload: Full Time				
Workload Type	Workload Description	Hours	Frequency	Average Weekly Learner Workload
Lecture	No Description	2	Every Week	2.00
Tutorial	No Description	1	Every Week	1.00
Independent Learning	No Description	7.5	Once per semester	0.63
Total Weekly Contact Hours				3.00
Workload: Part Time				
Workload Type	Workload Description	Hours	Frequency	Average Weekly Learner Workload
Lecture	No Description	24	Every Week	24.00
Independent Learning	No Description	101	Once per semester	8.42
Tutorial	No Description	12	Every Week	12.00
Total Weekly Contact Hours				36.00

Module Resources	
<i>Recommended Book Resources</i>	
<p>Behrouz Forouzan. (2013), Data Communications and Networking, 5th Edition. McGraw-Hill Science/Engineering/Math, p.1264, [ISBN: 0073376221].</p> <p>James F. Kurose and Keith W. Ross. (2012), Computer Networking: A Top-Down Approach, 6th Edition. Pearson Education, p.864, [ISBN: 0273768964].</p> <p>Andrew S Tanenbaum and David J. Wetherall. (2013), Computer Networks, 5th Edition. Pearson Education, [ISBN: 1292024224].</p> <p>Julia Panko and Raymond R. Panko. (2015), Business Data Networks and Security, 10th Edition. Pearson Education, [ISBN: 1292075414].</p>	
<i>Supplementary Book Resources</i>	
<p>William Stallings. (2013), Data and Computer Communications, 10th Edition. Pearson Education, [ISBN: 1292014385].</p>	
<i>This module does not have any article/paper resources</i>	
<i>This module does not have any other resources</i>	
Discussion Note:	