

H6DCN: Data Communications and Networking

Module Code:	H6DCN
Long Title	Data Communications and Networking APPROVED
Title	Data Communications and Networking
Module Level:	LEVEL 6
EQF Level:	5
EHEA Level:	Short Cycle
Credits:	5
Module Coordinator:	PAUL HAYES
Module Author:	David McCarthy
Departments:	School of Computing
Specifications of the qualifications and experience required of staff	<p>Lecturer preferably with Master's degree or PHD in a computing or cognate discipline. May have industry experience also.</p> <p>Proposed Lecturer: Dr. Paul Hayes. Dr. Sachin Sharma</p>
Learning Outcomes	
<i>On successful completion of this module the learner will be able to:</i>	
#	Learning Outcome Description
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
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
Dependencies	
Module Recommendations	
No recommendations listed	
Co-requisite Modules	
No Co-requisite modules listed	
Entry requirements	See section 4.2 Entry procedures and criteria for the programme including procedures recognition of prior learning.

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Module Content & Assessment			
Indicative Content			
Introduction to Data Communication • Data Communication. • Data versus Information. • Centralised and Distributed Processing. • Client-Server and Cloud Computing. • Categories of networks. • The Internet Protocols and standards • Emergent technologies			
Network Models • Layered architecture. • Encapsulation Peer-to-peer processes. • The OSI model. • Layers in the OSI model • TCP/IP protocol suite • TCP/IP versions			
Digital and Analog Transmission • Analog and digital signals. • Bandwidth Transmission Impairment. • Analog-to-digital conversion. • Transmission Mode			
Multiplexing and Switching • Wavelength-division multiplexing. • Circuit switching. • Packet switching. • Datagram approach • Virtual circuit approach			
Transmission Media • Characteristics of Guided Media • Twisted-Pair cable • Co-axial Cable • Fibre-optic cable •(Vertical and Horizontal) Integrity Enhancement Features Characteristics of Unguided Media • Radio waves, Microwaves, Infrared			
Local Area Networks • Multiple Access Protocols. • Traditional Ethernet CSMA/CD. • Switched Ethernet. • Fast Ethernet • Gigabit Ethernet • Wireless LAN • CSMA/CA			
Connecting LANs and Backbone Networks • Repeater • Hub • Switch • Router • Backbone Networks • Virtual LANs			
TCP/IP Network Layer Part 1 • IP Addressing • Subnetworking • Internetworking • IP Versions • Transition from IPv4 to IPv6			
TCP/IP Network Layer Part 2 • Address Mapping • ARP, RARP and BOOTP • DHCP • ICMP and IGMP			
Transport Layer • Introduction to Transport Layer • Process-to-Process Communications • Transport Layer Ports • Connectionless versus Connection-Oriented • Introduction to Transport Layer Protocols (e.g. TCP, UDP etc.			
Application Layer • Introduction to Application Layer • Application Layer Protocols (e.g. DNS, HTTP, FTP etc.			
Assessment Breakdown			%
Coursework			40.00%
End of Module Assessment			60.00%
Assessments			
Full Time			
Coursework			
Assessment Type:	Formative Assessment	% of total:	Non-Marked
Assessment Date:	n/a	Outcome addressed:	1,2,3,4,5,6
Non-Marked:	Yes		
Assessment Description: Ongoing independent and group class activities and feedback.			
Assessment Type:	CA 1 (0380)	% of total:	40
Assessment Date:	n/a	Outcome addressed:	1,2,3,4,5,6
Non-Marked:	No		
Assessment Description: Students may be assessed through continuous assessments, including at least 2 summative tests, that focus on student understanding of the course material.			
End of Module Assessment			
Assessment Type:	Terminal Exam	% of total:	60
Assessment Date:	End-of-Semester	Outcome addressed:	1,2,3,4,5,6
Non-Marked:	No		
Assessment Description: Written proctored end of semester examination to access all the learning outcomes.			
No Workplace Assessment			
Reassessment Requirement			
Repeat examination <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>			
Reassessment Description 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. Learners who fail this module will be required to sit a repeat module assessment where all learning outcomes will be examined.			

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Module Workload				
Module Target Workload Hours 0 Hours				
Workload: Full Time				
Workload Type	Workload Description	Hours	Frequency	Average Weekly Learner Workload
Lecture	No Description	24	Per Semester	2.00
Tutorial	No Description	12	Per Semester	1.00
Independent Learning	No Description	89	Per Semester	7.42
Total Weekly Contact Hours				3.00
Workload: Part Time				
Workload Type	Workload Description	Hours	Frequency	Average Weekly Learner Workload
Lecture	No Description	24	Per Semester	2.00
Tutorial	No Description	12	Every Week	12.00
Independent Learning	No Description	89	Per Semester	7.42
Total Weekly Contact Hours				14.00

Module Resources	
<i>Recommended Book Resources</i>	
<p>Julia Panko and Raymond R. Panko. (2015), <i>Business Data Networks and Security</i>, 10th Edition. Pearson Education, [ISBN: 1292075414].</p> <p>Andrew S Tanenbaum and David J. Wetherall. (2013), <i>Computer Networks</i>, 5th Edition. Pearson Education, [ISBN: 1292024224].</p> <p>James F. Kurose and Keith W. Ross. (2012), <i>Computer Networking: A Top-Down Approach</i>, 6th Edition. Pearson Education, p.864, [ISBN: 0273768964].</p> <p>Behrouz Forouzan. (2013), <i>Data Communications and Networking</i>, 5th Edition. McGraw-Hill Science/Engineering/Math, p.1264, [ISBN: 0073376221].</p>	
<i>Supplementary Book Resources</i>	
<p>William Stallings. (2013), <i>Data and Computer Communications</i>, 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:	