H7WN: Wireless Networking

Module Details

Long Title:	Wireless Networking APPROVED
Language of Instruction:	English
Module Code:	H7WN
Credits:	5
NFQ Level:	LEVEL 7
Field of Study:	Software and applications development and analysis
Valid From:	2016 (July 2016)
Module Delivered In	2 programme(s)
Module Coordinator:	Paul Stynes
Module Author:	PAUL HAYES
Teaching and Learning Strategy:	The module uses a learner-centred interactive approach which acknowledges the variety of learning preferences in the classroom. Learners are encouraged to question all the material that is presented and participation and teamwork is encouraged during the interactive lectures and tutorial sessions. The exercises are highly engaging and students are encouraged to work in teams if they wish. Thus learners have the opportunity of working and learning on their own, with scaffolding from a tutor or by engaging in peer-learning. Additionally, learners will also have access to web based support.
Learning Environment:	Learning will take place in a classroom/lab environment with access IT resources. Learners will have access to library resources, both physical and electronic and to faculty outside of the classroom where required. Module materials will be placed on Moodle, the College's virtual learning environment.
Module Description:	The aim of this module is to make students familiar with the basic concepts of modern wireless and mobile communication networks

Learning Outcomes	
On successful completion of this module the learner will be able to:	
LO1	Discuss the fundamental theory, concepts and principles behind wireless and mobile network technologies
LO2	Compare and contrast the different communication technologies used in wireless and mobile networks
LO3	Define and describe technology issues and terms used in wireless and mobile networking
LO4	Transfer and apply knowledge to a range of contexts and problems in the 'real world'
LO5	Recognise security issues in wireless and mobile networks
LO6	Identify current and future trends in wireless and mobile networking

Pre-requisite learning
Requirements *This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed. You may not enrol on this module if you have not acquired the learning specified in this section.*
Pre-requisite Module: Data Communications and Networking, Code BSHC19

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Module Content & Assessment

Indicative Content
Introduction to Wireless and Mobile Networking (10%) • Introduction • Definition of Terms • History of Wireless Communication • Machine to Machine (M2M) Communication • Internet of Things (IoT)
Wireless Transmission (10%) • Frequencies Allocation • Regulations • Signal Propagation • Modulation of Digital Data • Narrowband and Wideband Modulation
Media Access (10%) • FDMA • TDMA • CDMA
Wireless LAN Standards and Protocols (20%) • IEEE 802.11 WLAN Specifications • Protocols and Standards • PAN Technologies • Bluetooth • Zigbee • RFID Technology
Introduction to Wide Area Networks (10%) • Characteristics of WAN • WAN Technologies • Wireless WAN • Mobile Networks • Mobility Management • Mobile IP
Mobile Communication Systems (20%) • 2nd Generation - GSM • 2.5 Generation – GPRS and EDGE • 3rd Generation – UMTS • HSPA • Business Drivers • Emerging Technologies and Standards • 4th Generation Technologies • WiMAX • Long-Term Evolution (LTE) • Integration and Convergence • Future Trends
Satellite and Mobile Positioning (10%) • Positioning Systems and Technologies • Satellite Communication and Orbits • Global Positioning System (GPS) • Location-Based Services (LBS)
Security Issues (10%) • Wireless Security Principles • Wireless LAN Threats • Wireless Authentication • 802.1X/EAP Security • GSM, UMTS and LTE Security • Secure Mobile Commerce • Browsing and Download Threats (Viruses etc.)

Assessment Breakdown	%
Coursework	40.00%
End of Module Assessment	60.00%

Full Time

Coursework

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Test One	Sample Assessment: Differentiate between the two access protocols CSMA/CA and CSMA/CD. Explain why the IEEE802.11 standards use CSMA/CA and not CSMA/CD.	2,3,4,5	20.00	Week 6
Test Two	Sample Assessment: Explain and illustrate, with the aid of a diagram, the operation of the RTS/CTS handshake used in WLAN	2,3,4,5	20.00	Week 11

End of Module Assessment

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Terminal Exam	End-of-Semester Final Examination	1,2,3,4,5,6	60.00	End-of-Semester

Reassessment Requirement
Repeat examination *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.*
Reassessment Description Learners who fail this module will be required to sit a repeat module assessment where all learning outcomes will be examined

NCIRL reserves the right to alter the nature and timings of assessment

Module Workload

Full Time hours per semester		
WorkLoad Type	*WorkLoad Description*	*Hours*
Lecture	No Description	2
Tutorial	No Description	1
Independent Learning	No Description	7.5
	Total Hours	10.50

Part Time hours per semester		
WorkLoad Type	*WorkLoad Description*	*Hours*
Lecture	No Description	24
Independent Learning	No Description	101
	Total Hours	125.00

Module Resources

Recommended Book Resources

William Stallings 2013, *Wireless Communications and Networks*, 2nd Edition Ed., Pearson Education [ISBN: 129202738X]

James F. Kurose and Keith W. Ross 2013, *Computer Networking: A Top-Down Approach*, 6th Edition Ed., Pearson Education [ISBN: 0273768964]

Behrouz Forouzan 2013, *Data Communications and Networking*, 5th Edition Ed., McGraw-Hill Science/Engineering/Math [ISBN: 0073376221]

Supplementary Book Resources

Clint Smith and Daniel Collins 2014, *Wireless Networks*, 3rd Edition Ed., McGraw-Hill [ISBN: 0071819835]

Jim Geier 2015, *Designing and deploying 802.11 wireless networks*, 2nd Edition Ed., Cisco Press [ISBN: 1587144301]

This module does not have any article/paper resources

This module does not have any other resources

Module Delivered In

Programme Code	*Programme Title*
BSHC	BSc (Honours) in Computing (Approved)
BSHC	BSc (Honours) in Computing (Pending Approval)