MODULE DESCRIPTOR

Module Title

Analogue and Digital Communications

Reference	EN3522	Version	2
Created	August 2021	SCQF Level	SCQF 9
Approved	March 2004	SCQF Points	15
Amended	August 2021	ECTS Points	7.5

Aims of Module

To provide the student with a wide understanding and technical awareness of modern analogue and digital communication systems.

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

1	Describe signal coding procedures and show awareness of modern architectures used in the processing and transmission of digital signals.
2	Apply knowledge of data networks to design, configure, analyse, and troubleshoot a small IP network.
3	Explain types of LAN & WAN systems and define factors influencing design, operation and performance.
4	Discuss key operational principles of radar systems, satellite networks and fibre optic communications, and distinguish important design features.
5	Contrast and compare types of antenna systems used in long range and short range communication systems.

Indicative Module Content

Features of digital signals (error coding and detection, jitter, eye diagrams.). Spread spectrum systems. Mobile networks. Low power wireless networks (Zigbee, Bluetooth, Wi-Fi.). LANs/WANs: OSI layer, data transmission protocols, IPV4, IPV6. Transmission lines, Maxwells equations. Antennas and propagation. Transmitter and receiver architectures, Frequency synthesis, Phase Noise. Radar and satellite systems. Fibre optics.

Module Delivery

This module is delivered by a combination of lectures and tutorials. It will be supported by practical examples and activities including computer based laboratory exercises.

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Indicative Student Workload	Full Time	Part Time
Contact Hours	42	52
Non-Contact Hours	108	98
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	150
Actual Placement hours for professional, statutory or regulatory body		

ASSESSMENT PLAN

If a major/minor model is used and box is ticked, % weightings below are indicative only.

Component 1

Type:	Coursework	Weighting:	30%	Outcomes Assessed:	1
Description:	Report on a technical design, engineering problem or investigative task.				

Component 2

Type:	Examination	Weighting:	30%	Outcomes Assessed:	2, 3
Description:	Virtual learning environment online quiz assessment.				

Component 3

Type:	Examination	Weighting:	40%	Outcomes Assessed:	4, 5
Description:	Closed book examination.				

MODULE PERFORMANCE DESCRIPTOR

Explanatory Text

To pass the module the student must achieve a minimum of a grade D. Non-submission of any component will result in an NS grade.

Module Grade	Minimum Requirements to achieve Module Grade:
A	Two A's and one B in any component.
B	One A one C and one D in any component OR Two B's and one C in any component.
C	One B and two D's in any component OR Two C's and one D in any component
D	One C and two D's in any component OR D?s in all components.
E	E in one or more components.
F	F in one or more components.
NS	Non-submission of work by published deadline or non-attendance for examination

Module Requirements

Prerequisites for Module	EN2520 or similar.
Corequisites for module	None.
Precluded Modules	None.

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ADDITIONAL NOTES

An Indicative Bibliography will normally reference the latest edition of a text. In some cases, older editions are equally useful for students and therefore, those are the editions that may be stocked.

INDICATIVE BIBLIOGRAPHY

1	Bensky A. Short-range wireless communication. Newnes; 2019 Aug 1.
2	Kumar S. Wireless Communications Fundamental & Advanced Concepts: Design Planning and Applications. River Publishers; 2015 Mar 31.
3	Stallings W. Data and computer communications. Pearson Hall, 10th edition; 2014.
4	Introduction to Networks Companion Guide (CCNAv7) By Cisco Networking Academy, 2020.
5	Roshan, Pejman, and Jonathan Leary. 802.11 Wireless LAN fundamentals. Cisco press, 2004.