

MODULE DESCRIPTOR

Module Title

Telecommunications 1

Reference	EN2522	Version	1
Created	July 2023	SCQF Level	SCQF 8
Approved	March 2004	SCQF Points	15
Amended	June 2022	ECTS Points	7.5

Aims of Module

To provide the student with the ability to analyse the fundamentals of communication techniques and information theory.

Learning Outcomes for Module

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

- 1 Apply knowledge of mathematics and statistics and engineering principles to broadly-defined problems in data transmission (Information Theory).
- 2 Compare fundamental principles of communication signals, modulation schemes and transmission systems and channels.
- 3 Formulate simple digital and analogue based telecommunication systems.
- 4 Adopt a holistic and proportionate approach to the mitigation of security risks
- 5 Use practical laboratory skills to investigate and explain the behaviour of circuits and processes relating to telecommunications systems.

Indicative Module Content

Fundamental concepts: Frequency, phase, amplitude, SNR, BER. Time and frequency domain signal representation, bandwidth, noise. Analogue & digital modulation techniques. Radio transmitter and receiver topologies. Digital transmission: sampling, quantisation, companding, Pulse Code Modulation, Multiplexing. Information Theory: sources, entropy, channel capacity. Data Transmission, Modems, Telecommunications standards, Cryptography and data security.

Module Delivery

This module is delivered by a combination of lectures and tutorials. It will be supported by lab based practical work and activities involving computer simulation exercises.

Indicative Student Workload

	Full Time	Part Time
Contact Hours	40	40
Non-Contact Hours	110	110
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:	Examination	Weighting:	70%	Outcomes Assessed:	1, 2, 3, 4
Description:	Closed book examination.				

Component 2

Type:	Coursework	Weighting:	30%	Outcomes Assessed:	5
Description:	Portfolio of evidence logbook.				

MODULE PERFORMANCE DESCRIPTOR**Explanatory Text**

The module has 2 components and to gain an overall pass a minimum D grade must be achieved in each component. The component weighting is as follows: C1 is worth 30% and C2 is worth 70%.

		Coursework:						NS
		A	B	C	D	E	F	
Examination:	A	A	A	B	B	E	E	
	B	B	B	B	C	E	E	
	C	B	C	C	C	E	E	
	D	C	C	D	D	E	E	
	E	E	E	E	E	E	F	
	F	F	F	F	F	F	F	
	NS	Non-submission of work by published deadline or non-attendance for examination						

Module Requirements

Prerequisites for Module	EN1512 Introduction to Analogue Electronics and Signals or equivalent.
Corequisites for module	None.
Precluded Modules	None.

INDICATIVE BIBLIOGRAPHY

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| 1 | Glover I, Grant PM. Digital communications. Pearson Education; 2010. |
| 2 | Stallings W. Data and computer communications. Pearson Hall; 2013. |
| 3 | Schiller JH. Mobile communications. Pearson education; 2003. |
| 4 | Haykin SS, Moher M. Modern wireless communications. Pearson Education India; 2011. |
| 5 | Haykin S. Communication systems. John Wiley & Sons; 2008. |
| 6 | Dunlop J. Telecommunications engineering. Routledge; 2017. |