

MODULE DESCRIPTOR

Module Title

Electrical and Electronic Design

Reference	EN1562	Version	4
Created	February 2024	SCQF Level	SCQF 7
Approved	March 2021	SCQF Points	15
Amended	April 2024	ECTS Points	7.5

Aims of Module

To provide the student with a strong foundation and understanding of common electrical and electronic circuits, systems and techniques used in industrial environments and sensor systems.

Learning Outcomes for Module

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

- 1 Describe types of signals and analogue devices commonly found in electronics.
- 2 Identify basic circuits used in analogue and switching electronics.
- 3 Apply practical skills in the areas of analogue circuit construction, testing and signal analysis.
- 4 Present technical reports from focused lab-based experiments and wider self-investigation.

Indicative Module Content

Analogue: Introduction to semiconductor devices used in routine analogue circuits: diodes, op-amps, bi-polar junction transistors, field effect transistors, etc. Overview of common signals used in electronics and analysis of signals from fundamentals. Introduction to analogue concepts: bandwidth, gain/attenuation, single-ended/differential signals, waveform limiting/shaping, feedback, rectification/regulation, device modelling and noise. General outline of analogue circuit application areas. Digital: Boolean algebra, truth tables and Karnaugh maps. Synthesis and analysis of basic combinatorial circuits. Sequential logic, flip-flops, registers and counters.

Module Delivery

This is a lecture based course supplemented with tutorial sessions, laboratory exercises and directed study.

Indicative Student Workload

	Full Time	Part Time
Contact Hours	60	N/A
Non-Contact Hours	90	N/A
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	N/A
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:	50%	Outcomes Assessed:	1, 2
Description:	Closed book assessed tutorials or online quizzes.				

Component 2

Type:	Coursework	Weighting:	50%	Outcomes Assessed:	3, 4
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 50% and C2 is worth 50%.

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

Module Requirements

Prerequisites for Module	None.
Corequisites for module	None.
Precluded Modules	None.

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 FLOYD, T.L., 2015. Digital Fundamentals. 11th ed. Harlow: Pearson.
- 2 BEARDS, P., 2002. Analog and Digital Electronics. 2nd ed. Upper Saddle River, NJ: Prentice Hall.
- 3 BIRD, J.O., 2017. Electrical Circuit Theory and Technology. 6th ed. Abingdon: Routledge.
- 4 Sergio Franco, 2009, Electric Circuits Fundamentals.
- 5 STOREY, N., 2013. Electronics: a Systems Approach. 5th ed. Harlow: Pearson.