

## 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.

<b>Indicative Student Workload</b>	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
<i>Actual Placement hours for professional, statutory or regulatory body</i>		

### 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.