

## MODULE DESCRIPTOR

### Module Title

Electrical and Electronic Design

Reference	EN1562	Version	2
Created	August 2021	SCQF Level	SCQF 7
Approved	March 2021	SCQF Points	15
Amended	August 2021	ECTS Points	7.5

### Aims of Module

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

### Learning Outcomes for Module

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

- 1 Describe typical transient behaviour in circuits and systems.
- 2 Understand modelling as applied to two port networks.
- 3 Discuss basic types of analogue and digital circuits and their conversion.
- 4 Design typical measurement and control circuits.

### Indicative Module Content

Variations of current and voltages in RL and RC circuits. Growth and decay curves, analysis of circuit time constant and realisation of transients and steady state behaviours. Open and short circuit tests and four terminal parameters of  $\pi$  and T networks. Image impedance, iterative impedance, characteristic impedance and cascaded networks. Diodes, op amps, logic gates, flip flops, counters and DAC/ADC conversion. Introduction to sensors and transducers. Signal conditioning and interfacing techniques. Representation of signals in frequency and time domain.

### 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	36	N/A
Non-Contact Hours	114	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: Coursework Weighting: 70% Outcomes Assessed: 1, 2, 3  
 Description: Online quiz assessments.

**Component 2**

Type: Coursework Weighting: 30% Outcomes Assessed: 4  
 Description: Report.

**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 (y axis) is worth 70% and C2 (x axis) is worth 30%.

		Coursework:						
		A	B	C	D	E	F	NS
Coursework:	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: 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**

- JACOB, J.M., 1988. Industrial Control Electronics, Applications and Design. Englewood Cliffs, NJ : Prentice Hall.
- BEARDS, P., 2002. Analog and Digital Electronics. 2nd ed. Upper Saddle River, NJ: Prentice Hall.
- BIRD, J.O., 2017. Electrical Circuit Theory and Technology. 6th ed. Abingdon: Routledge.