

## MODULE DESCRIPTOR

### Module Title

Introduction to Electrical Engineering

Reference	EN1560	Version	4
Created	January 2017	SCQF Level	SCQF 7
Approved	March 2004	SCQF Points	15
Amended	August 2017	ECTS Points	7.5

### Aims of Module

To provide the student with the ability to understand electrostatic and electromagnetic concepts and the principles of electric circuit analysis.

### Learning Outcomes for Module

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

- 1 Select suitable solutions for simple electromagnetic and electrostatic design problems.
- 2 Analyse simple electromagnetic and electrostatic systems.
- 3 Solve problems in the areas of; elementary concepts and components of DC circuits, circuit analysis using Kirchoffs Laws and simple use of j-notation.
- 4 State the basic theory and solve problems in; real voltages and current sources, AC theory, components of AC circuits and representation of phasors using complex numbers.

### Indicative Module Content

Basic concepts of electrostatics, electric charge, electric flux, electric field strength, potential and potential difference; Definition of capacitance, parallel plate capacitor. Basic concepts of electromagnetism, magnetic field, magnetic field density, magnetic field strength, Ampere's law, principles of magnetic circuits and inductance of a simple magnetic circuit. Faraday's law of electromagnetic induction. Electric circuits, circuit concepts, voltage and current sources, resistance, current flow and potential distribution. Ohm's and Kirchhoff's laws, simple circuit analysis using Kirchhoff's laws. Reasons for use of alternating current for light and heavy current applications, choice of sinusoidal waveform. Amplitude, frequency and phase concepts. Inductive capacitive impedance concepts, simple time domain analysis of ac circuits, phasor representation of ac quantities, rms representation of voltage and current.

### Module Delivery

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

**Indicative Student Workload**

	Full Time	Part Time
Contact Hours	50	50
Non-Contact Hours	100	100
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	150
<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:	30%	Outcomes Assessed:	1, 3
Description:	Assessed tutorials and campus moodle quizzes.				

**Component 2**

Type:	Examination	Weighting:	70%	Outcomes Assessed:	2, 4
Description:	Formal closed book examination.				

**MODULE PERFORMANCE DESCRIPTOR****Explanatory Text**

To pass the module, you must achieve at least a 40% weighted average mark in the exam and coursework. In addition you need to achieve at least 35% in both the individual exam and coursework Components.

Module Grade	Minimum Requirements to achieve Module Grade:
<b>A</b>	>70%
<b>B</b>	60-69%
<b>C</b>	50-59%
<b>D</b>	40-49%
<b>E</b>	35-39%
<b>F</b>	0-34%
<b>NS</b>	Non-submission of work by published deadline or non-attendance for examination

**Module Requirements**

Prerequisites for Module	None in addition to course entry requirements.
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 BIRD, J.O., 2017. Electrical and Electronic Principles and Technology. 6th ed. Oxford: Routledge.
- 2 STOREY, N., 2017. Electronics - A Systems Approach. 6th ed. Harlow: Pearson.
- 3 MAXFIELD C. et al., 2008. Electrical Engineering: Know it all. Oxford: Newnes.
- 4 MORRIS, N., 1994. Electrical and Electronic Engineering Principles. Harlow: Pearson/Prentice Hall.