

Module specification

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Module Code	ENG4D2
Module Title	Electrical Engineering
Level	4
Credit value	20
Faculty	FACE
HECoS Code	100164
Cost Code	GAME
Pre-requisite module	N/A

Programmes in which module to be offered

Programme title	Core/Optional/Standalone
FdEng Industrial Engineering (Mechanical)	Core
FdEng Industrial Engineering (Electrical)	
BEng (Hons) Mechanical Engineering with Manufacture	
BEng (Hons) Electrical Engineering with Manufacture	
BEng (Hons) Sustainable Energy Engineering	

Breakdown of module hours

Learning and teaching hours	18 hrs
Placement tutor support hours	0 hrs
Supervised learning hours e.g. practical classes, workshops	18 hrs
Project supervision hours	0 hrs
Active learning and teaching hours total	36 hrs
Placement hours	0 hrs
Guided independent study hours	164 hrs
Module duration (Total hours)	200 hrs

Module aims

This module combines conceptual teaching with guided practical work to strengthen students' understanding of fundamental principles. Learners explore how theoretical knowledge connects with real-world practice through structured experimentation and applied tasks. The approach

builds confidence, technical awareness, and the ability to apply knowledge effectively within authentic learning contexts.

This module aims to provide students with a foundational understanding of electrical and electronic engineering by introducing essential principles, components, and circuit theories, equipping learners with the knowledge and confidence to progress into advanced study and future engineering careers.

Module Learning Outcomes

At the end of this module, students will be able to:

1	Explain and apply fundamental electrical principles to analyse the behaviour of simple circuits.
2	Explain and use basic electrical formulae to solve engineering problems involving circuit design and performance.
3	Select and apply appropriate materials, equipment, and engineering technologies in practical experiments and simulations, recognising their limitations.

Assessment

Indicative Assessment Tasks:

This section outlines the type of assessment task the student will be expected to complete as part of the module. More details will be made available in the relevant academic year module handbook.

Assessment 1: Written Assignment

Assessment will be undertaken through a written report in which students present the outcomes of practical experiments and circuit simulations. The report will follow a structured format provided in the assignment brief and will require learners to explain circuit functions, apply theoretical knowledge to practical scenarios, and demonstrate their ability to select and apply appropriate engineering technologies and processes.

Assessment number	Learning Outcomes to be met	Type of assessment	Duration/Word Count	Weighting (%)	Alternative assessment, if applicable
1	1-3	Written Assignment	2000	100%	N/A

Derogations

Credits shall be awarded by an Assessment Board for those modules in which a pass mark 40% has been achieved, with a minimum mark of 30% in each assessment element.

Learning and Teaching Strategies

Learning and teaching combine classroom-based instruction with structured laboratory practice to reinforce theoretical understanding through application. Students participate in lectures, workshops, and supervised experiments that link principles to professional practice. Online materials and activities complement face-to-face sessions, supporting reflection and self-paced learning. Tutorials and group discussions promote collaboration and the development of analytical and communication skills.

Welsh Elements

This module will be delivered through the medium of English; however, students have the option to submit their assessments in the medium of Welsh. While this module is not currently offered fully through Welsh, Welsh language support and guidance are available, and some learning materials or tutorial discussions may incorporate Welsh elements where appropriate. To further promote bilingual learning, all students have the opportunity to take the 20-credit *Welsh for STEM* short course, designed to develop confidence and subject-specific language skills in both English and Welsh.

Indicative Syllabus Outline

- Fundamental electrical principles: Students will study voltage, current, resistance, and power, developing a conceptual understanding of how these principles interact within electrical systems and applying them to practical contexts.
- Calculations using basic electrical formulae: Learners will practise applying Ohm's Law, Kirchhoff's Laws, and power equations to analyse and design simple circuits, reinforcing analytical skills and problem-solving.
- The function of basic electronic circuit components: The role and operation of resistors, capacitors, diodes, and transistors will be examined, enabling students to select and apply appropriate components in circuit design while recognising their limitations in line with AHEP4 outcomes.

Indicative Bibliography

Please note the essential reads and other indicative reading are subject to annual review and update.

Essential Reads:

J. Bird, *Electrical and Electronic Principles and Technology*, 7th ed. Abingdon, U.K.: Routledge, 2021.

Other indicative reading:

D. Johnson, Fundamentals of Electrical Engineering I. Open Textbook Library, 2014. [Online].
Available: <https://open.umn.edu/opentextbooks/textbooks/337>

Administrative Information

For office use only	
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