

# Prifysgol Wreccsam Wrexham University

## Module specification

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Module Code	ENG397
Module Title	Engineering Principles
Level	3
Credit value	20
Faculty	FACE
HECoS Code	100184
Cost Code	GAME
Pre-requisite module	N/A

### Programmes in which module to be offered

Programme title	Core/Optional/Standalone
STEM Foundation Year	Optional
WUCCE International Foundation Year (Engineering)	Core
BEng (Hons) Aeronautical & Mechanical Engineering (with International Foundation Year)	Core
BEng (Hons) Automotive Engineering (with International Foundation Year)	Core
BEng (Hons) Renewable & Sustainable (Engineering with International Foundation Year)	Core
BEng (Hons) Electrical and Electronic Engineering (with International Foundation Year)	Core

### Breakdown of module hours

Learning and teaching hours	36hrs
Placement tutor support hours	0 hrs
Supervised learning hours e.g. practical classes, workshops	12 hrs
Project supervision hours	0 hrs
<b>Active learning and teaching hours total</b>	<b>48 hrs</b>
Placement hours	0 hrs
Guided independent study hours	152 hrs
<b>Module duration (Total hours)</b>	<b>200 hrs</b>



## Module aims

This module aims to equip and empower students to use key engineering principles to solve real world engineering problems. Through lectures and laboratory sessions, students will gain the skills needed to understand engineering in a broad context and recognise the important principle used in their subject area.

## Module Learning Outcomes

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

1	Understand the basic units used within engineering sciences and the engineering/scientific notation
2	Solve problems in mechanical sciences in the area of motion, energy and structures
3	Use physics principles to analyse electrical circuits
4	Introduce and analyse basic renewable energy technology in comparison with fossil fuels

## 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: Portfolio of work to test the students' knowledge of engineering principles, that may include in-class tests, and an essay on renewable energy sources.

Assessment number	Learning Outcomes to be met	Type of assessment	Duration/Word Count	Weighting (%)	Alternative assessment, if applicable
1	1,2, 3	Portfolio	NA	100	N/A

## Derogations

None

## Learning and Teaching Strategies

Aligned with the principles of the Active Learning Framework (ALF), the module will incorporate a blended digital approach utilising a Virtual Learning Environment (VLE). These resources may include a range of content such as first and third-party tutorials, instructional videos, supplementary files, online activities, and other relevant materials to enhance their learning experience.

The module will be delivered through a combination of lectures, tutorials and lab practical sessions. Interactive workshops will facilitate hands-on learning, while case studies and project work will allow students to apply their knowledge to real-world scenarios. Access to lecture materials and additional resources will be provided via the University's VLE platform.

## Welsh Elements

Elements of the Welsh language and culture will be embedded throughout the module.

## Indicative Syllabus Outline

### Physical Sciences

- Physical quantities and units
- Making measurements and analysing data
- Nature of quantities

### Mechanical Science

- Motion
- Forces in action
- Work, energy and power
- Materials Properties
- Newton's laws of motion and momentum

### Electrical Science

- Charge and current
- Energy, power and resistance
- Electrical circuits
- Waves

### Renewables

- Fossil Fuels
- Types of Renewable energy
- Nuclear Energy fundamentals
- Net zero and alternative energy sources in the automotive, aeronautical and civil engineering industries

### Civil Engineering

- Frameworks
- Bridges
- Trusses
- Sustainability

## Indicative Bibliography

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

### Essential Reads:

Bird, J. (2021), Bird's Electrical Circuit Theory and Technology. 7th ed. Routledge.

J. Wickert, J. (2020), An Introduction to Mechanical Engineering, 4th ed. Cengage.

B. Everett. et al. (2021), Energy Systems and Sustainability: Power for a Sustainable Future. UK: Open University

Other indicative reading:

Everett, B. (2012), Energy Systems and Sustainability, 2nd ed. Oxford: Oxford University Press.

Soutsos, M. and Domone, P. (eds.) (2017), Construction Materials: Their Nature and Behaviour. 5th ed. Boca Raton, FL: CRC Press.

### Administrative Information

<b>For office use only</b>	
Initial approval date	4 Sept 2024
With effect from date	Sept 2024
Date and details of revision	July 2025: Reapproved as part of the IFY validation
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