Prifysgol Wrecsam
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

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
STEM Foundation Year	Optional

Pre-requisites

None

Breakdown of module hours

Learning and teaching hours	36hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	12 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
Total active learning and teaching hours	**48** hrs
Placement / work based learning	0 hrs
Guided independent study	152 hrs
Module duration (total hours)	200 hrs

For office use only	
Initial approval date	4 Sept 2024
With effect from date	Sept 2024
Date and details of revision	
Version number	1

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:
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	Weighting (%)
1	1,2,3,4	Portfolio	100

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.

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.