

Module specification

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Module Code	ENG4D4
Module Title	Practical Engineering Skills
Level	4
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
BEng (Hons) Aerospace Engineering BEng (Hons) Mechanical Engineering BEng (Hons) Motorsport Engineering BEng (Hons) Electrical Engineering BEng (Hons) Renewable Energy Engineering	Core

Breakdown of module hours

Learning and teaching hours	15 hrs
Placement tutor support hours	0 hrs
Supervised learning hours e.g. practical classes, workshops	45 hrs
Project supervision hours	0 hrs
Active learning and teaching hours total	60 hrs
Placement hours	0 hrs
Guided independent study hours	164 hrs
Module duration (Total hours)	200 hrs

Module aims

This module places strong emphasis on hands-on experience supported by targeted theoretical instruction. Students engage in applied investigations that demonstrate the relationship between ideas and outcomes, developing observational, measurement, and evaluative skills. Through practical exploration, learners gain a deeper appreciation of core concepts and their relevance to professional environments.

This module aims to equip students with essential practical engineering skills through hands-on workshop and laboratory activities, developing safe working practices, technical confidence, and problem-solving ability that form a strong foundation for further study and professional engineering practice.

Module Learning Outcomes

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

1	Apply safe and effective laboratory and workshop practices to investigate broadly defined engineering problems, selecting and using appropriate tools, materials, equipment, and processes in accordance with relevant standards and codes of practice
2	Apply practical engineering solutions to defined tasks, considering health and safety, user needs, basic commercial and environmental factors, and applying a structured approach to risk identification and mitigation.
3	Function effectively as an individual and as a member of a technical team, demonstrating responsibility, communication, and professional behaviour during practical engineering activities.

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: Practical Portfolio

This assessment evaluates students' practical engineering competence through the completion and documentation of structured workshop and laboratory activities.

Students submit an evidence-based portfolio demonstrating the planning, execution, and evaluation of practical tasks. Evidence may include photographs, recorded measurements, annotated notes, sketches, and brief technical commentary.

The portfolio should demonstrate:

- safe and appropriate use of tools, equipment, and processes,
- correct application of methods to complete defined tasks,
- clear recording of measurements and observations,
- basic interpretation of results, including accuracy, limitations, and sources of error,
- consideration of risk, safety, and working practices,
- appropriate professional behaviour, including teamwork where relevant.

Minimum expectation: The portfolio must include a representative range of practical activities and provide sufficient evidence of method, results, and interpretation to support academic judgement of competence and achievement of the learning outcomes. Evidence must be clear, structured, and attributable to the student.

Assessment number	Learning Outcomes to be met	Type of assessment	Duration/Word Count	Weighting (%)	Alternative assessment, if applicable
1	1-3	Portfolio	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 is primarily practical, supported by focused theoretical teaching to ensure clear understanding of underpinning principles. Students engage in applied tasks and experimental work designed to strengthen problem-solving and observational skills. Virtual learning resources enhance preparation and reflection, while small-group tutorials encourage active participation and confidence in discussing technical findings.

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

Safe working practices and risk management:

Workshop safety, personal protective equipment (PPE), hazard identification, safe systems of work, and application of basic risk assessment and control measures in practical engineering environments.

Tools, equipment and measurement techniques:

Use of measurement instruments, machining tools, assembly equipment, and basic electrical tools. Consideration of accuracy, tolerances, and limitations of processes and measurements.

Execution of practical engineering tasks:

Completion of structured workshop and laboratory activities, including machining, assembly, wiring, and test setups, following defined requirements and constraints.

Recording and interpretation of practical work:

Documentation of practical activities through measurements, observations, and annotated evidence. Basic interpretation of results, including accuracy, limitations, and sources of error.

Professional practice in practical environments:

Working individually and in small groups during supervised activities, demonstrating appropriate communication, organisation, and professional behaviour.

Indicative Bibliography

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

Essential Reads:

D. A. McLean, *Engineering Workshop Practice*, 5th ed. Oxford, UK: Butterworth-Heinemann, 2019.

Other indicative reading:

Engineering Council, *Accreditation of Higher Education Programmes (AHEP 4)*, London, UK, 2020.

HSE, *Health and Safety in Engineering Workshops*, UK Health and Safety Executive, Guidance Note, 2022.

J. Bird and C. Ross, *Mechanical Engineering Principles*, 4th ed. London, UK: Routledge, 2020.

Administrative Information

For office use only	
Initial approval date	June 2026
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