

Module specification

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Module Code	ENG4AS
Module Title	Engineering Materials
Level	4
Credit value	10
Faculty	FAST
HECoS Code	100203
Cost Code	GAME
Pre-requisite module	L3 Properties and Applications of Engineering Materials (or similar).

Programmes in which module to be offered

Programme title	Core/Optional/Standalone
HNC Mechanical Technology	Core

Breakdown of module hours

Learning and teaching hours	30 hrs
Placement tutor support hours	0 hrs
Supervised learning hours e.g. practical classes, workshops	0 hrs
Project supervision hours	0 hrs
Active learning and teaching hours total	30 hrs
Placement hours	0 hrs
Guided independent study hours	70 hrs
Module duration (Total hours)	100 hrs

Module aims

To develop knowledge and understanding of a range of materials used in engineering. To understand a relationship between properties of materials and manufacturing processes.

Module Learning Outcomes

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

1	Select and apply appropriate materials for use in a range of engineering application
2	Demonstrate understanding of a relationship between properties of materials and manufacturing processes.
3	Select and apply materials and processes for given manufacturing outcomes.
4	Diagnose causes of material failure.

Assessment

Indicative Assessment Tasks:

Assessment is 100% in-course. 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: A report comparing properties of materials and the testing of said materials.

Assessment 2: A report on the appropriate materials for manufacturing and causes of failure.

Assessment number	Learning Outcomes to be met	Type of assessment	Duration/Word Count	Weighting (%)	Alternative assessment, if applicable
1	1,2	Portfolio	1000 words	50%	
2	3,4	Coursework	1000 words	50%	

Derogations

Normal

Learning and Teaching Strategies

Theory will be delivered by a series of lectures underpinned with video/DVD support and practical or demonstration laboratory work where possible. Evaluation of learning will be as outlined above with report including a write up of practical work if possible. Assessments will ensure that the student has the opportunity to meet all of the stipulated learning outcomes.

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.

Indicative Syllabus Outline

1. Aeronautical/Mechanical Materials

Selection Criteria: Categorisation of materials.

Tests: Measurement of mechanical, physical, chemical, and processing properties of materials. Possible groups for delivery: Strength, hardness, toughness, fatigue, creep, wear, formability, thermal, optical.

Sources: British and/or EN standards, product data sheets.

2. Processes

Manufacturing Processes: Heat Treatment. Liquid processing. Mechanical processing. Adhesives.

Composition/structure relationships. Structure/Property relationships.

3. Processing

Functional Analysis: Stresses and environment. Appropriate Materials Processing. The inter-relationship between design, material and processing.

Processing Limitations: Effects of Structure Preventing/Facilitating Processing.

4. Failure

Causes of Failure: Service Life. Estimation.

Improving: Remedial/preventative measures.

Indicative Bibliography

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

Essential Reads:

Bolton, W. (2016) Materials for Engineering. 2nd revised ed. Routledge.

Other indicative reading:

Shackelford, J.F. (2014) Introduction to Materials Science for Engineers. 8th ed. Pearson

Administrative Information

For office use only	
Initial approval date	6 July 2021
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Date and details of revision	6 July 2021, revalidated. 05/05/2026 updated to new template during re-validation.
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