

Module specification

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Refer to the module guidance notes for completion of each section of the specification.

Module code	ENG4AS
Module title	Engineering Materials
Level	4
Credit value	10
Faculty	FAST
Module Leader	Dr N. Luhyna
HECoS Code	100203
Cost Code	GAME

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
HNC Mechanical Technology	Core

Pre-requisites

L3 Properties and Applications of Engineering Materials (or similar).

Breakdown of module hours

Learning and teaching hours	30 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	0 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
Total active learning and teaching hours	30 hrs
Placement / work based learning	0 hrs
Guided independent study	70 hrs
Module duration (total hours)	100 hrs

For office use only	
Initial approval date	6 July 2021

For office use only	
With effect from date	September 2021
Date and details of revision	6 July 2021, revalidated
Version number	Version 1

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.

Assessment One: A report comparing properties of materials and the testing of said materials (1000 words)

Assessment Two: A report on the appropriate materials for manufacturing and causes of failure (1000 words).

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1, 2,	Portfolio	50%
2	3, 4	Coursework	50%

Derogations

None.

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.

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

Employability skills – the Glyndŵr Graduate

Each module and programme is designed to cover core Glyndŵr Graduate Attributes with the aim that each Graduate will leave Glyndŵr having achieved key employability skills as part of their study. The following attributes will be covered within this module either through the content or as part of the assessment. The programme is designed to cover all attributes and each module may cover different areas. [Click here to read more about the Glyndwr Graduate attributes](#)

Core Attributes

Engaged

Creative

Ethical

Key Attitudes

Curiosity

Resilience

Confidence

Practical Skillsets

Digital Fluency
Critical Thinking
Communication