

Liverpool John Moores University

Title: ENGINEERING MATERIALS AND MANUFACTURING PROCESSES
Status: Definitive
Code: **4503ICBTME** (127030)
Version Start Date: 01-08-2021
Owning School/Faculty: Engineering
Teaching School/Faculty: ICBT, Colombo

Team	Leader
Alison Cotgrave	Y

Academic Level: FHEQ4
Credit Value: 15
Total Delivered Hours: 68
Total Learning Hours: 150
Private Study: 82

Delivery Options

Course typically offered: S2 and Non Std S2 (S2 for Jan)

Component	Contact Hours
Lecture	45
Off Site	6
Tutorial	15

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	AS1	Report (1500 words)	30	
Exam	AS2	Exam	70	2

Aims

This unit will provide learners with the necessary background knowledge and understanding of the macro and micro properties, testing, selection, manufacturing and failure of engineering materials. This unit also aims to provide students with the appropriate set of skills in order to design a product and select the most adequate manufacturing technologies to transform raw materials into a tradable product based

on economic, functional and sustainable aspects including application of machine tools.

Learning Outcomes

After completing the module the student should be able to:

- 1 Identify the differences in properties of common engineering material categories.
- 2 Select suitable materials and processing methods for a specific product.
- 3 Interpret the in-service causes of failure of engineering materials.
- 4 Describe different manufacturing processes, manufacturing materials and tools.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

REPORT	2		
Exam	1	3	4

Outline Syllabus

Macro and micro properties of common engineering materials (Metals, Ceramics, Polymer, Semi-conductors, Composites).

Structure of common engineering materials and the influence of structure on properties.

Common material testing methods to assess properties of engineering materials and testing standards.

Sources of material property data.

Principles of common manufacturing processes and limitations.

Materials property requirements and manufacturing requirements for a product.

Common failure methods of engineering materials (Creep, Fatigue, Tensile).

Categories of manufacturing processes for metals, ceramics, polymers and composites.

Advantages and disadvantages of each method.

Selection of materials.

Common manufacturing machines, tools, equipment.

Learning Activities

Students will be supported in their learning, to achieve the above learning outcomes, in the following ways:

By a series of lectures and tutorials and through participation within laboratory practical sessions for problem solving.

Self-managed investigative study to analyse cases related to selection of materials and failure of materials.

In-class participation and case studies are key features of this module.

A recommended resource list - indicating key reading, internet support and physical learning assistance, is provided to help enable students to undertake self-directed study.

Notes

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