

Liverpool John Moores University

Title: Advanced Materials Engineering
Status: Definitive
Code: **7006MSC** (121675)
Version Start Date: 01-08-2021

Owning School/Faculty: Engineering
Teaching School/Faculty: Engineering

Team	Leader
James Ren	Y

Academic Level: FHEQ7
Credit Value: 10
Total Delivered Hours: 47
Total Learning Hours: 100
Private Study: 53

Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	22
Practical	6
Seminar	6
Tutorial	11

Grading Basis: 50 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Examination	70	2
Report	AS2	Materials Properties Selection	30	

Aims

To develop a wide knowledge of advanced materials and to study the materials selection process involved in the design and manufacture of engineering products.

Learning Outcomes

After completing the module the student should be able to:

- 1 Critically review the mechanical performance and applications of a range of engineering materials
- 2 Demonstrate knowledge of the structures, properties of composites and high performance alloys and new development
- 3 Select materials to meet the performance requirements of a range of engineering applications
- 4 Have knowledge of the use of life cycle analysis and maintainability principles and practices with respect to recycling issues

Learning Outcomes of Assessments

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

Examination	1	2	3	4
Materials Properties Selection	1	2	3	

Outline Syllabus

Structure, properties and applications of engineering materials - metals, polymers, foams, rubbers and composites

Advanced materials, applications: Low weight structures, composites and high performance alloys

The selection of materials on the basis of performance requirements:- strength, stiffness, toughness, fatigue resistance and energy absorption.

New modern materials development

Life cycle analysis and maintainability related to recycling issues.

Learning Activities

A series of lectures supported by tutorials, seminars, case studies and practical laboratory work

Notes

This module will provide an in depth understanding of the structure and properties of advanced modern materials together with techniques available for improving properties of materials. The selection of materials based applications will also be developed.