

Liverpool John Moores University

Title: Advanced Materials Engineering
Status: Definitive
Code: **7117MSE** (120739)
Version Start Date: 01-08-2018

Owning School/Faculty: Maritime and Mechanical Engineering
Teaching School/Faculty: Maritime and Mechanical Engineering

Team	Leader
James Ren	Y

Academic Level: FHEQ7 **Credit Value:** 10 **Total Delivered Hours:** 45
Total Learning Hours: 100 **Private Study:** 55

Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	20
Practical	6
Seminar	6
Tutorial	10

Grading Basis: 50 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Examination	70	3
Essay	AS2	Materials Properties and Applications	30	

Aims

To develop a systematic in-depth knowledge of advanced materials and to study the modern material techniques and selections involved in the development of high performance products.

Learning Outcomes

After completing the module the student should be able to:

- 1 Critically review the properties, functions and applications of a range of modern materials
- 2 Demonstrate integrated knowledge of high performance engineering and functional materials and new developments
- 3 Select materials to meet the performance requirements of engineering applications under challenging working conditions
- 4 Have knowledge 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 and Selec	1	2	3	

Outline Syllabus

Structure, properties and applications of modern materials; theories and characterisation techniques

Advanced composites: structure-property relationships, different reinforcement mechanisms, manufacturing techniques and future developments

Functional materials developments and applications

Performance enhancement techniques of materials: surface treatments, coatings, joining;

The development and selection of materials for challenging working conditions: high temperature, corrosion, etc.

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 functions of materials. The selection of materials for performance enhancement under challenging working conditions will also be developed.