

## Liverpool John Moores University

Title: ADVANCED MATERIALS  
Status: Definitive  
Code: **7019MAR** (115915)  
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
Sam Tammas-Williams	

**Academic Level:** FHEQ7      **Credit Value:** 10      **Total Delivered Hours:** 44  
**Total Learning Hours:** 100      **Private Study:** 56

### 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	2
Essay	AS2	Materials Properties and Applications	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 and Selec	1	2	3	

## Outline Syllabus

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

*Advanced materials, applications: Low weigh 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.