

## Liverpool John Moores University

Title: Advanced Manufacturing Processes  
Status: Definitive  
Code: **7118MSE** (120740)  
Version Start Date: 01-08-2018

Owning School/Faculty: General Engineering Research Institute  
Teaching School/Faculty: General Engineering Research Institute

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

### Delivery Options

Course typically offered: Runs Twice - S1 & S2

Component	Contact Hours
Lecture	24
Practical	6
Tutorial	12

**Grading Basis:** 50 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS3	Examination	70	2
Portfolio	AS1	Portfolio 1	15	
Portfolio	AS2	Portfolio 2	15	

### Aims

*To provide a broad understanding of advanced manufacturing technologies and their applications.*

## Learning Outcomes

After completing the module the student should be able to:

- 1 Gain comprehensive knowledge of the mechanisms of the manufacturing processes.
- 2 Identify benefits and drawbacks of different manufacturing processes for various applications.
- 3 Decide suitable manufacturing processes for given product materials and requirement.
- 4 Select appropriate process conditions for the optimum manufacturing outcomes.
- 5 Select and apply suitable process monitoring methods and control strategies.

## Learning Outcomes of Assessments

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

Examination	1	2	3	4	5
Portfolio 1	1	3	4		
Portfolio 2	1	4	5		

## Outline Syllabus

*Current developments, industrial and fundamental principles of advanced manufacturing technologies - abrasive machining, electrical discharge machining and laser materials processing.*

*Abrasive machining – scientific fundamentals of the mechanical material removal process, the engineering concepts of abrasive processing, the abrasive tools and their preparation, the mechanics and thermal behaviour of grinding, and the process monitoring and control strategies for abrasive machining.*

*Electrical discharge machining (EDM) - the scientific principles of material removal mechanism of EDM, tool wear and influential operating parameters. Different implementations of EDM, such as Wire EDM, Sink EDM, and Micro EDM.*

*Laser processing - High power laser sources for materials processing, laser processing systems. Detailed studies of laser welding, laser micromachining, laser surface treatments, and the laser processing of carbon fibre reinforced polymer materials.*

## Learning Activities

A combination of lectures, tutorials and practical sessions.

## **Notes**

The module is designed to provide broader knowledge of advanced manufacturing technologies, in particular abrasive machining, electrical discharge machining and laser processing. Students will appreciate the fundamental principles of these technologies and will be able to apply them in suitable industrial applications. Current development of these technologies will be reviewed in the course.