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Title: Manufacturing Processes Engineering  
Status: Definitive  
Code: **7010MSC** (121680)  
Version Start Date: 01-08-2019

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

Team	Leader
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**Academic Level:** FHEQ7      **Credit Value:** 10      **Total Delivered Hours:** 41

**Total Learning Hours:** 100      **Private Study:** 59

### Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	22
Practical	6
Tutorial	11

**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 processing.*

*Abrasive machining - fundamentals of the mechanical material removal process, the general 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 fundamental principles of EDM, the 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 - introduction to the generation and properties of high power laser beams for materials processing, laser processing systems. Introduction to the range of possible laser processing applications. Detailed study of laser welding, laser micromachining and the laser processing of fibre reinforced composite materials.*

## **Learning Activities**

A combination of lectures, tutorials and practical sessions.

### **Notes**

The module is designed to provide broader understanding 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.