**Liverpool** John Moores University

Warning: An incomplete or missing proforma may have resulted from system verification processing

| | |
|---|---|
| Title: | Manufacturing Processes Engineering |
| Status: | Definitive |
| Code: | **7122ENG** (120107) |
| Version Start Date: | 01-08-2019 |
| Owning School/Faculty: | Maritime and Mechanical Engineering |
| Teaching School/Faculty: | Maritime and Mechanical Engineering |

| Team | Leader |
|---|---|
| Xun Chen | Y |
| Tahsin Opoz | |
| Martin Sharp | |
| Paul French | |

| | | | | | |
|---|---|---|---|---|---|
| **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 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.