



## **Module Specification**

# Lean Manufacturing Technology

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## Part 1: Information

**Module title:** Lean Manufacturing Technology

**Module code:** UFMFDY-30-3

**Level:** Level 6

**For implementation from:** 2023-24

**UWE credit rating:** 30

**ECTS credit rating:** 15

**Faculty:** Faculty of Environment & Technology

**Department:** FET Dept of Engineering Design & Mathematics

**Partner institutions:** None

**Field:** Engineering, Design and Mathematics

**Module type:** Module

**Pre-requisites:** None

**Excluded combinations:** None

**Co-requisites:** None

**Continuing professional development:** No

**Professional, statutory or regulatory body requirements:** None

## Part 2: Description

**Overview:** The modern manufacturing environment employs a spectrum of technologies, tools and systems to produce contemporary products. This module provides practitioners with a concise overview of such technologies and systems. This module will also familiarize students with the principles and tools and techniques for modern smart manufacturing facility design and continued improvement. This module also reviews the skills and techniques required to analyse manufacturing systems and to design improved methods and layouts.

**Features:** Not applicable

**Educational aims:** The aim of this module is to enable students to understand the tools, concepts and practices employed by modern manufacturing organisations to satisfy customer requirements. The student should be able to critically review and evaluate the application of lean techniques in the management and control of various manufacturing and service environments.

**Outline syllabus:** The focus will be on the following topics:

Design for manufacture to include: Manufacturing Process Stages (design > prototyping > testing & quality > production > distribution); Effects of design on efficiency; Effects of operations on efficiency

Lean Concepts as they apply to manufacturing segments: Traditional vs Lean; Batch vs Flow manufacturing process design; Value Stream mapping (HMLV, LMHV, Small-Batch); Lean supply chain and minimizing waste, sustainability; and Application of IoT and Industry 4.0 support the lean factory

Advanced Manufacturing Technologies which includes: The route to SMART manufacturing; Identifying milestones enroute to SMART; designing products and process for sustainable production; Computer integrated manufacturing; Adoption of Flexible manufacturing systems; and Rapid prototyping and time compression technologies

### **Part 3: Teaching and learning methods**

**Teaching and learning methods:** Scheduled learning: material will be delivered in whole cohort sessions and via on-line resources. The majority of the learning activities will take place on a combination of lectorials, discussion groups, case studies and 'hands on' use of tools and techniques that provide exposure to contemporary advanced manufacturing, its systems and technologies.

Independent learning: includes hours engaged with essential reading, assignment preparation and completion etc.

**Module Learning outcomes:** On successful completion of this module students will achieve the following learning outcomes.

**MO1** Apply knowledge and understanding of the principles of lean operations and advanced manufacturing systems management

**MO2** Develop a detailed set of production requirements using market trends, legislation and regulations governing global manufacturing industries.

**MO3** Select or appraise technologies to support the Smart factory

**MO4** To Evaluate value-added technologies in robotics, mechatronics, and inspection to address the needs in automation

**MO5** Select CAD/CAM/CAE tools and technologies to generate and manufacture a component

**MO6** Select advance digital manufacturing technologies for shop-floors, enterprises and supply chains

**Hours to be allocated:** 300

**Contact hours:**

Independent study/self-guided study = 228 hours

Face-to-face learning = 72 hours

Total = 300

**Reading list:** The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://rl.talis.com/3/uwe/lists/A2CA2593-13B7-48C5-B151-6425D28FEEAE.html?lang=en-GB&login=1) via the following link <https://rl.talis.com/3/uwe/lists/A2CA2593-13B7-48C5-B151-6425D28FEEAE.html?lang=en-GB&login=1>

## **Part 4: Assessment**

**Assessment strategy:** The module will be assessed via assessment designed to engage students in the application of advanced lean manufacturing technologies in modern factory environments and ensure that students have authentic and

attributable knowledge.

The assessment for this module is as follows:

A group case study ensuring that students appreciate the value of team work within a design activity. Individual understanding will be assessed by a viva examination. The output is a 5000 word report.

A presentation covering individual contribution to the group work followed by 5 mins question period to assess in-depth individual knowledge of the theory and concepts of the range of methods employed in smart lean manufacturing systems.

Resit is the same as the first sit

Resit deliverable(s) will be scaled appropriately to group size and task complexity

**Assessment tasks:**

**Presentation (First Sit)**

Description: Individual Presentation

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO3, MO4

**Report (First Sit)**

Description: Group Report (not more than 5000 words)

Weighting: 50 %

Final assessment: No

Group work: Yes

Learning outcomes tested: MO1, MO2, MO5, MO6

**Presentation (Resit)**

Description: Individual Presentation

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO3, MO4

**Report (Resit)**

Description: Group Report (not more than 5000 words)

Resit deliverable(s) will be scaled appropriately to group size and task complexity

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO5, MO6

**Part 5: Contributes towards**

This module contributes towards the following programmes of study: