

Module Specification

Principles of Lean Engineering

Version: 2025-26, v3.0, Approved

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Part 1: Information

Module title: Principles of Lean Engineering

Module code: UFMEE8-15-M

Level: Level 7

For implementation from: 2025-26

UWE credit rating: 15

ECTS credit rating: 7.5

College: College of Arts, Technology and Environment

School: CATE School of Engineering

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 module offers an overview of Lean engineering, identifying appropriate tools and techniques for supporting business improvement. It emphasises the importance of strategy and leadership in enabling Lean practices that drive a culture of continuous improvement.

A key aspect of the module is the need for a coordinated, structured, and scientific approach in adopting and implementing Lean thinking and Lean engineering within

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an organisation. It also explores the challenges and benefits of implementing these practices across the entire enterprise, beyond just manufacturing.

Features: Not applicable

Educational aims: This module provides an introduction to the principles of Lean manufacturing and engineering, highlighting the significance of Lean philosophies, principles, systems, tools and techniques in improving the efficiency and profitability of manufacturing and service operations.

Outline syllabus: Topics are likely to include, but not limited to:

Lean Awareness Introduction to Lean thinking, its history, culture and philosophy.

Lean Principles, Measures, and Metrics Identifying and quantifying waste to enhance process and product performance.

Lean Techniques

Utilising Lean continuous improvement techniques such as Value Stream Mapping, Standardised Work, Standard Work Combination Table, Kanban, Poke-Yoke, 5S, and Visual Management to reduce or eliminate all forms of waste, increase process efficiencies and create value.

Problem Solving and Continuous Improvement Techniques Apply methods such as the Plan-Do-Check-Act cycle, KAIZEN, and root cause analysis techniques such as 5-Why and Ishikawa diagrams.

Fundamentals and Approaches in Leading Change The acceptance of and commitment for change that aims at sustaining Lean by integrating Lean behaviour, Lean leadership, vision and strategy in an organisation.

Change Management Methodologies and Lean Transformation Approaches Introduction to the Kotter methodology (The 8 steps for Leading Change) and the Prosci ADKAR model.

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Lean Initiatives for Environmental Impact

Addressing the environmental impact and performance throughout the entire product and process life-cycle.

Part 3: Teaching and learning methods

Teaching and learning methods: Lectures

Core concepts and scenarios will be presented during lectures.

Tutorials

Small discussion groups will follow lectures to consolidate understanding.

Experiential Exercises and Simulations

These activities will help students connect with Lean thinking and problem-solving techniques covered by this module.

Independent Study

Students are expected to engage in reading and directed study outside formal sessions.

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

MO1 Evaluate and synthesise relevant information regarding Lean philosophies, principles, systems and tools to enhance the effectiveness of manufacturing and service operations

MO2 Critically reflect upon the need for leading with Lean principles, engaging people through systems and applying tools to solve business problems and eliminate waste

MO3 Demonstrate through evaluation the need for a coordinated, structured, and scientific approach in adopting and implementing Lean engineering within an organisation

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link <u>https://uwe.rl.talis.com/modules/ufmee8-15-m.html</u>

Part 4: Assessment

Assessment strategy: The assessment strategy has been designed to ensure that students can understand and apply Lean thinking, concepts, and its principles to apply and evaluate their impact on business improvement.

Students will demonstrate their knowledge and skills in applying Lean thinking through an individual assignment. This assignment requires independent learning of theory and critical reflection of their work.

The output of this assignment will be a 2,000-word time constrained individual report.

The resit assessment strategy will be the same as the first sit, based on a new piece of work.

Assessment tasks:

Report (First Sit) Description: Individual report (2,000 words); time constrained task (one week). Weighting: 100 % Final assessment: Yes Group work: No Learning outcomes tested: MO1, MO2, MO3

Report (Resit)

Module Specification

Description: Referral similar to the first sit. Weighting: 100 % Final assessment: Yes Group work: No Learning outcomes tested: MO1, MO2, MO3

Part 5: Contributes towards

This module contributes towards the following programmes of study: Aerospace Engineering (Manufacturing) [Sep][PT][Frenchay][8yrs] MEng 2018-19 Aerospace Engineering (Systems) [Sep][PT][Frenchay][8yrs] MEng 2018-19 Aerospace Engineering [Sep][SW][Frenchay][5yrs] MEng 2021-22 Engineering Management [GCET] MSc 2024-25 Engineering Competence {Apprenticeship-UWE} [Frenchay] PGDip 2024-25 Engineering Management [GCET] MSc 2025-26 Engineering Management [GCET] MSc 2025-26 Engineering Management [Frenchay] MSc 2025-26 Engineering Competence {Apprenticeship-UWE} [Frenchay] PGDip 2025-26 Engineering Management [Frenchay] MSc 2025-26 Aerospace Engineering with Pilot Studies [Frenchay] MEng 2022-23 Aerospace Engineering [Frenchay] MEng 2022-23 Aerospace Engineering with Pilot Studies [Frenchay] MEng 2022-23 Aerospace Engineering [Frenchay] MEng 2022-23 Mechanical Engineering [Frenchay] MEng 2022-23 Aerospace Engineering [Sep][PT][Frenchay][8yrs] MEng 2018-19 Aerospace Engineering with Pilot Studies [Sep][SW][Frenchay][5yrs] MEng 2021-22 Automotive Engineering [Sep][SW][Frenchay][5yrs] MEng 2021-22

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Mechanical Engineering [Sep][SW][Frenchay][5yrs] MEng 2021-22 Mechanical Engineering [Frenchay] MEng 2022-23 Automotive Engineering [Frenchay] MEng 2022-23 Aerospace Engineering [Frenchay] MEng 2022-23 Aerospace Engineering with Pilot Studies [Frenchay] MEng 2022-23