Engineering Tripos Part IIA, 3E10: Operations Management for Engineers, 2025-26

Leader

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Timing and Structure

Lent term. 16 lectures and 4 examples classes.

Aims

The aims of the course are to:

- Introduce Operations Management to students coming specifically from an engineering background.
- Give a foundation course for any engineering student who aims to take on an operations focused role at a manufacturing or service firm or go into management consultancy.

Objectives

As specific objectives, by the end of the course students should be able to:

- Understand the role, objectives and activities of Operations Management
- Be familiar with the main Operations Management concepts and techniques, which they can apply in practice.

Content

Operations management is the business function concerned with the creation, management and improvement of processes. These processes must be efficient and effective in the delivery of products and services. This module will cover the key tools, techniques and practices required to manage a modern manufacturing and service operation. We will explore the issues faced by operations managers as well as examining how companies can differentiate themselves based on their operations strategy. This module will introduce the key tools and techniques of operations management, and provide experience of process improvement methodologies, such as Lean production and Six Sigma quality across a range of industries. The course will emphasise the importance of being able to observe and analyse an operation, and to recognise operational excellence.

Topics covered:

- Delivering operational efficiency: process design and analysis:
- Ensuring operational effectiveness: quality management
- Delivering improvements: the Six Sigma organisation
- Delivering improvements: the Lean enterprise
- Managing a project: implementing improvements
- Managing resources: facilities, materials, people and technology
- Creating value across the supply chain
- Operations strategy: ensuring organisational alignment

Further notes

TEACHING METHODS

A mixture of:

- Interactive lecture sessions
- In-class exercises
- Case studies

Coursework

To be announced in lectures.

There is no Full Technical Report (FTR) associated with this module.

Booklists

Please refer to the Booklist for Part IIA Courses for references to this module, this can be found on the associated Moodle course.

Examination Guidelines

Please refer to Form & conduct of the examinations [3].

UK-SPEC

This syllabus contributes to the following areas of the UK-SPEC [4] standard:

Toggle display of UK-SPEC areas.

GT1

Develop transferable skills that will be of value in a wide range of situations. These are exemplified by the Qualifications and Curriculum Authority Higher Level Key Skills and include problem solving, communication, and working with others, as well as the effective use of general IT facilities and information retrieval skills. They also include planning self-learning and improving performance, as the foundation for lifelong learning/CPD.

IA1

Apply appropriate quantitative science and engineering tools to the analysis of problems.

KU1

Demonstrate knowledge and understanding of essential facts, concepts, theories and principles of their engineering discipline, and its underpinning science and mathematics.

KU2

Have an appreciation of the wider multidisciplinary engineering context and its underlying principles.

D3

Identify and manage cost drivers.

D5

Ensure fitness for purpose for all aspects of the problem including production, operation, maintenance and disposal.

S1

The ability to make general evaluations of commercial risks through some understanding of the basis of such risks.

S2

Extensive knowledge and understanding of management and business practices, and their limitations, and how these may be applied appropriately to strategic and tactical issues.

E2

Ability to extract data pertinent to an unfamiliar problem, and apply its solution using computer based engineering tools when appropriate.

E4

Understanding of and ability to apply a systems approach to engineering problems.

P1

A thorough understanding of current practice and its limitations and some appreciation of likely new developments.

P3

Understanding of contexts in which engineering knowledge can be applied (e.g. operations and management, technology, development, etc).

P7

Awareness of quality issues.

P8

Ability to apply engineering techniques taking account of a range of commercial and industrial constraints.

US2

A comprehensive knowledge and understanding of mathematical and computer models relevant to the engineering discipline, and an appreciation of their limitations.

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