

TITLE:	Manufacturing Systems Design
CODE:	ENX300
CREDITS:	20
LEVEL:	3
SCHOOL:	SCAT
MODULE BOARD:	BEng
PRE-REQUISITES:	NONE
CO-REQUISITES:	NONE
LEARNING HOURS:	200 The nature of which is specified in the module guide

LEARNING OUTCOMES:

Knowledge

- JIT systems philosophies and concepts
- Maintenance strategies and their application
- Tools for the analysis of manufacturing systems.

Abilities

- To be able to critically appraise the various sub-elements of the JIT methodology and their linkages.
- Be able to design and critically appraise a specific maintenance strategy for a given context.
- To be able to apply a range of analytical tools and critically appraise the outcome.

CONTENT SYNOPSIS

Just in Time as a manufacturing methodology: This element will consider the origins and elements of the JIT methodology in detail and cover both theoretical and practical implementation. Sub elements to be considered include, reduction of breakdowns (OEE), pull production systems, kanbans (theory and application), machine set-ups, inventories etc.

Maintenance Strategies: will outline and discuss the key maintenance strategies from the ‘run to failure’ in the 1950s to the development of modern maintenance practices, i.e. TPM, RCM and CBM in the 1980s and onwards.

Tools for Manufacturing Analysis: A range of tools are introduced and applied within a manufacturing context to analyse existing performance and aid the development of models and systems which achieve an enhanced level of productivity. Typical examples include, Rank-order clustering, Product flow diagrams (added-value, dist travelled, changes of ownership etc), Ishikawa diagrams.

It focuses upon three units:

1. **JIT/Lean Operations** – an approach which sets out to achieve efficient and effective manufacturing operations by the systematic removal of waste;

2. **Maintenance** – this unit considers the different approaches to maintenance and applies the Overall Equipment Effectiveness (OEE) measure as a tool to assess maintenance performance;
3. **Tools for Manufacturing Analysis and Improvement** - considers a range of tools and techniques that can be used to analyse and improve the performance of manufacturing systems.

TEACHING AND LEARNING METHODS

Lectures covering methodologies and techniques will be interactive using examples to illustrate key approaches and outcomes. Tutorials including application and simulation of key concepts are also utilised. Case studies and journal papers will also be used for discussion purposes and key elements will be developed during the seminar sessions.

ASSESSMENT METHOD

An examination testing learning outcomes 1,2,3,4,5,6 and contributing 100% of the final module mark;

CORE TEXT:

The module is driven by a core text:

SLACK, CHAMBERS AND JOHNSTON, 2007, OPERATIONS MANAGEMENT, 5TH EDITION, FT PRENTICE HALL.

OR

SLACK, CHAMBERS AND JOHNSTON, 2004, OPERATIONS MANAGEMENT, 4TH EDITION, FT PRENTICE HALL.

Page references will be provided for the 4th Edition followed by 5th Edition page numbers in brackets ()

You need to obtain a copy of either text as the module and study guide are structured around a number of its key chapters.

STUDY GUIDE:

A study guide is provided to help you navigate the text book by indicating what chapter sections are relevant to each lesson. In addition it provides key summary points, self-assessment questions and exercises to support your learning

PROGRAMMES USING THIS MODULE AS CORE/OPTION

B.Eng Electrical and Electronic Engineering
B.Eng Mechanical Engineering
B.Eng Auto
B.Eng Manufacturing

MODULE LEADER

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