

# SECOND SEMESTER 2023-2024

Course Handout Part II

Date: 11-08-2023

In addition to part-I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

*Course No.* : ME F316

*Course Title* : MANUFACTURING MANAGEMENT

*Instructor-in-Charge* : AMRITA PRIYADARSHINI

# Course Description:

Introduction to manufacturing systems, forecasting, life cycle concepts, facility location and layout planning, aggregate and batch production planning, scheduling, inventory control, material requirement planning, and enterprise resource planning, just-in-time and lean manufacturing, total quality management, supply chain management and Industry 4.0.

# Scope and Objective of the Course:

Scope

* To provide a good fundamental concepts in manufacturing / operations management
* To promote the importance of decision making in manufacturing / operations management
* To study the decision making in design, planning and control of conversion process / manufacturing systems
* To develop decision making skills in conversion process / manufacturing systems
* To make proficient in manufacturing / operations management Objectives
* To understand the role of operations management in the overall business strategy of the firm.
* To understand the interdependence of the operating system with other key functional areas of the firm.
* To identify and evaluate the key factors and the interdependence of these factors in the design of effective operating systems.
* To identify and evaluate a range of tools appropriate for analysis of operating systems of the firm.
* To identify and evaluate comparative approaches to operations management in a global context.
* To understand the application of operations management policies and techniques to the service sector as well as manufacturing firms.

# Textbooks:

1. Heizer Jay, Render Barry and Rajashekhar, “Operations Management”, Pearson, New Delhi

# Reference books

1. Russell R.S. & Taylor, B.W., “Operations Management: Quality and Competitiveness in a Global Environment”, 5th Edition, John Wiley and Sons (Asia) Pte. Ltd., 2006
2. Mahadevan B., “Operations Management : Theory and Practice”, 2nd Edition, Paerson, 2010
3. Chase, R.B., Aquilano, N.J., and Jacobs, F.R., “Operation Management for Competitive Advantage”, 11th Edition, McGraw-Hill,

# Course Plan:

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| **Lecture No.** | **Learning objectives** | **Topics to be covered** | **Chapter in**  **the Text Book** |
| 1 | * To gain an understanding of the Production and Operations function for manufacturing and service organizations | ***Introduction***: Operations / manufacturing, decision making in an organization / conversion process | 1 (T1) |
| 3 | * Understand sources of demand variability * Able to pick the appropriate forecasting model | ***Forecasting***: Types, importance, steps, approaches, methods | 3 (T1) |
| 7 | * Understand the concept of product life cycle * Understand the application of the steps in product design * Apply the concept for generation of new idea | ***Product planning***: Product strategy options, product life cycle, product development, Quality function deployment, application of decision trees to product design | 4 (T1) |
| 9 | * Understand the strategic importance of process selection * Can explain the influence that process selection will have on organization’s   performance | ***Process planning***: Process design, process technologies, process analysis and design, selection of equipment and technology | 6 (T1) |
| 11 | * Identify and explain major factors that affect locations decisions * Able to select   appropriate methods of | ***Facilities location***: Selecting the geographic region, costing alternative locations, scoring models, geometric models, Locating multiple facilities, Location of facilities on networks | 7 (T1) |

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|  | evaluating location alternatives |  |  |
| 13 | * Understand the   strategic importance of layout decisions   * Able to discuss important issues   related to various types of layout | ***Layout of Facilities***: Types of layout, process, product, hybrid, fixed-position and specialized layouts | 8 (T1) |
| 15 | * Describe methods of measuring   capacity, planning capacity, and calculating capacity  utilization. | ***Capacity planning***: Design and effective capacity, capacity and strategy, managing demand, Break even analysis, applying decision trees to capacity planning | Supplement (T1) |
| 17 | * Explain what   scheduling involves and the importance of good scheduling   * Discuss scheduling needs in job shops | ***Scheduling***: Hierarchy of planning decision, planning process, approaches for aggregate planning, master schedule, short-term schedules, control of schedules | 12, 14 (T1) |
| 20 | * Discuss the main   requirements for effective inventory management   * Describe the role of basic models in controlling production capacity | ***Inventory control:*** Functions of inventory, type of inventory, inventory management, inventory models | 11 (T1) |
| 23 | * Discuss various strategies involved in aggregate planning | ***Aggregate Planning:*** Concepts, types of strategies |  |
| 25 | * Develop product structure * Build a gross requirements plan | ***Material Requirements Planning:*** MRP structure, MRP management, lot sizing techniques | 13 (T1) |
| 27 | * Understand the basic role of SCM and lean concepts in OM * Understand the role of Industry 4.0 | ***Introductory concepts:*** SCM, Lean concepts and Industry 4.0 |  |
| 30 | * Analyze and   experiment with the  processes in a virtual setting, | Application of Flexsim: Overview of Flexsim, importance/need, features, applications |  |

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|  | reducing the time and cost requirements associated with physical testing |  |  |
| Total number of lectures = 30 | | | |

**Evaluation Scheme:**

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| **Component** | **Duration** | **Weightage (%)** | **Date & Time** | **Nature of Component** |
| Mid Semester Examination | 90 minutes | 30 | 12/10 - 11.30 - 1.00PM | Closed Book |
| Tutorial/ Case Studies/Surprise  Quizzes |  | 25 |  | Open Book |
| Comprehensive Examination: | 180 minutes | 45 | 14/12 AN | Closed Book |

**Chamber Consultation Hour:** Will be announced in the class

**Notices:** Will be displayed on CMS only.

**Make-up Policy:** Make-up will be granted **ONLY** in genuine cases with ***prior permission***. The request application for make-up test must be reached to the Instructor-in-charge before commencement of the scheduled test (documentary proof is essential).

*NOTE: The border cases in final grading will be decided based on mainly class room attendance and attentiveness in the classroom.*

**Academic Honesty and Integrity Policy**: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

# INSTRUCTOR-IN-CHARGE

**MF F316**