

**ME457: PRODUCTION AND OPERATION MANAGEMENT**  
**CREDITS = 5 (L=3, T=0, P=2)**

**Course Objective:**

To illustrate concepts and processes involved in the management of production and operations pertaining to manufacturing.

**Teaching and Assessment Scheme:**

Teaching Scheme			Credits	Assessment Scheme				Total Marks
L	T	P		Theory		Practical		
			ESE	CE	ESE	CE	150	
3	0	2	5	70	30	30		20

**Course Contents:**

Unit No.	Topics	Teaching Hours
1	<b><u>Introduction:</u></b> Functional subsystems of organizations, system concept of production, types of production system, productivity, strategic management, Gross Domestic Product (GDP) and its impact, world class manufacturing Product Design and Analysis: What is Product Design and Analysis?, New product development concepts, process planning and design, process design, value analysis/ value engineering, standardization, simplification, make or buy decision, ergonomic consideration in product design, concurrent engineering.	06
2	<b><u>Forecasting:</u></b> nature and use of forecast, source of data, forecasting models	04
3	<b><u>Line Balancing:</u></b> Concept of mass production system, objective of assembly line balancing, rank positional weight method, model for assembly line balancing, and stochastic assembly line balancing Line of Balance (LOB): application areas, inputs of LOB, steps of LOB.	04
4	<b><u>Materials management and Inventory control:</u></b> Integrated materials management, components of Integrated materials management, inventory control, models of inventory, operations of inventory systems, quantity discount, implementation of purchase inventory model, purchasing management, stores management.	05

5	<b><u>Capacity planning and Investment Decisions:</u></b> Capacity planning, investment decisions Aggregate planning and master production scheduling: aggregate planning, master production plan/schedule. Materials Requirement Planning (MRP): Product structure/ bill of materials (BOM), MRP concept, lot sizing in MRP I, MRP II Production Planning and Control (PPC): Introduction, Scheduling Single Machine Scheduling: concept, rules to minimize (a) mean flow time (b) maximum lateness, methods to minimize tardiness, introduction to parallel processors under single machine scheduling Flow shop scheduling: Johnson's rule, branch & bound technique, CDS heuristic, Palmers heuristic Job shop scheduling: introduction, schedule generation, heuristic procedures, two job and M-machine scheduling.	14
6	<b><u>Modern Production Management Tools:</u></b> Just-in time, CIM & FMS, TQM, ISO 9000 series, Poke Yoke, Kaizen, Business Process Engineering, Supply Chain Management, Lean Six Sigma Manufacturing, Quality Function Deployment, ERP.	09
<b>TOTAL</b>		<b>42</b>

**List of References:**

1. Buffa, Sarin, “*Modern Production/Operations management*”, John Wiley and Sons, 2007.
2. Aswathappa, K., Bhat, S., “*Production and Operations management*”, Himalaya Publication House, 2010
3. Bedi, K. “*Production and Operations management*” (2nd Ed.).Oxford Higher Education, 2007
4. Paneerselvam, R., “*Production and Operations management*” (3rd ed.),PHI Learning, 2012
5. Mahadevan, B., “*Operations management: Theory and Practice*” (2nd Ed.).Pearson Education India, 2010
6. Stevenson, W. J., “*Operations Management*” (12th ed.), McGraw-Hill, 2014.

**Course Outcomes (COs):**

At the end of this course students will be able to

1. Explain various concepts involved in product design and development
2. Explain forecasting in the context of business
3. Explain the requirement of line balancing and line of balance in production systems
4. Manage materials and inventory
5. Explain the process of planning and scheduling
6. Differentiate various modern production management tools