

Subject Code: <b>MME-4102</b>	Course Title: <b>Management of Production and Operation systems</b>	Total Contact Hours: <b>42</b>	<b>L: 3</b>	<b>T: 0</b>	<b>P: 0</b>	<b>C: 3</b>
Pre-requisite: <b>Not applicable</b>		Year: <b>4</b>	Semester: <b>Even</b>			
Type of Course: <b>Open Elective Course (OEC)</b>						

**Learning objective:**

This graduate-level course covers the production and operations system and related problems. This course blends quantitative and qualitative material, theoretical and practical perspectives, and thus, bears relevance for academic as well as industrial pursuits. The goal is to make the subject of production and operations management (P/OM) interesting, even exciting, to those who are embarking on a career that involves a business of any kind. This includes the business of making a profit, as well as not-for-profit applications. Yes, P/OM applies directly to helping people who are under stress (as in humanitarian operations) as well as for everyone striving to have a better life. Since P/OM capabilities deal equally with goods and services, the fields of hospitality, travel, healthcare, education, entertainment, and agriculture are as vital a part of its purview as manufacturing. To understand the fundamental concepts of operations management in the manufacturing and service sectors.

**Course Outcomes (COs):**

<b>On completion of this course, the students will have the ability to:</b>		<b>Bloom's Level</b>
<b>CO-1</b>	Apply analytical skills and problem-solving tools to resolve the operational issues.	3
<b>CO-2</b>	Analyze forecasts for a company's products and location of facilities.	4
<b>CO-3</b>	Recommend an appropriate capacity management approach under changing demand.	5
<b>CO-4</b>	Develop a project plan and schedule, and assess project completion probabilities.	5
<b>CO-5</b>	Analyze and solve decision problems using decision making approaches under uncertain and risky conditions.	4
<b>CO-6</b>	Recommend investment and replacement decisions.	5

**Course Topics:**

<b>UNITS</b>	<b>COURSE TOPIC</b>	<b>Lecture Hours</b>	<b>COs</b>
<b>UNIT 1</b>	<b>INTRODUCTION TO PRODUCTION AND MANAGEMENT SYSTEMS</b>	<b>4</b>	<b>CO1</b>
	The Systems Viewpoint, The Systems Approach, Information Systems for Manufacturing and Services, Defining Operations, Costs and Revenues		

UNITS	COURSE TOPIC	Lecture Hours	COs
	Associated with Input–Output (I/O) Models, Product/Service Design: Introducing new products and services, Product life-cycle stages. Product mix decisions.		
<b>UNIT 2</b>	<b>WORKLOAD ASSESSMENT &amp; LOCATION DECISION</b>	<b>8</b>	<b>CO2, CO3</b>
	Work Assessment – Need, types and various techniques. Time Series and Extrapolation, Assessment by Time-Series Analysis, Regression Analysis, Delphi Method. Location Decisions: Understanding the factors affecting the location choices and application of various models to choose location of facilities.		
<b>UNIT 3</b>	<b>INVENTORY MANAGEMENT &amp; SCHEDULING</b>	<b>6</b>	<b>CO1</b>
	Types of Inventory Situations, Inventory-Related Costs, EOQ Model, ABC Classification, Perpetual Inventory Systems, Periodic Review Inventory Systems. Introduction, Classification of Scheduling Problems, Two Machines Flow-Shop Problem, Single-Machine Scheduling, Assignment & Transportation Problems.		
<b>UNIT 4</b>	<b>PROJECT MANAGEMENT AND LONG-TERM PLANNING</b>	<b>6</b>	<b>CO4</b>
	Managing Projects, Good Project Managers Are Leaders, Basic Rules for Managing Projects, Project Networks, Critical Path Model, PERT. Facility location – Factors affecting selection of plant location, Factor rating analysis: Break –even, Load distance model, Closeness ratings. Plant layout: Types of plant layout, criteria for good layout, Process layout, Assembly line balancing. Capacity planning – Analysis of designed capacity, Installed capacity, commissioned capacity, Utilized capacity, Factors affecting productivity and Capacity expansion strategies.		
<b>UNIT 5</b>	<b>DECISION THEORY</b>	<b>6</b>	<b>CO5</b>
	Meaning and Steps in Decision Making, Types of Management Decisions, Decision under Certainty, under Risk, under Uncertainty, Decision Trees.		
<b>UNIT 6</b>	<b>INVESTMENT AND REPLACEMENT ANALYSIS</b>	<b>6</b>	<b>CO6</b>
	Investment Analysis: Break-Even Analysis, Payback Period Method. Replacement Analysis: Replacement of Items that Deteriorate, Replacement of Items that Fail Suddenly.		

**Reference books:**

1. Harold Koontz (2009) “Essentials of Management”, 8/E, Tata McGraw Hill.
2. E.S. Buffa (2010) “Modern Production / Operations Management”, 8/E, John Wiley & Sons. ISBN: 9788126513727.

3. **R. Panneerselvam (2012) "Production and Operations Management" PHI.**
4. Chapman (2015) "Fundamentals of Production Planning and Control" PHI. ISBN-10: 013017615X.
5. **Sushil Gupta, Martin Starr (2014) "Production and Operations Management Systems", CRC Press. ISBN 9781466507333.**
6. **Nigel Slack, Alistair Brandon-Jones, Robert Johnston (2016) "Operations Management", 8/E, Pearson Education Limited. ISBN-10: 1292098678.**
7. S.N. Chary (2009) "Production and Operations Management", 4/E, Tata McGraw Hill. ISBN: 0070091536
8. F.S. Hillier and G.J. Lieberman (2010) "Introduction to Operations Research- Concepts and Cases", 9<sup>th</sup> Edition, Tata McGraw Hill. 2010.
9. **P.K Gupta and D.S Hira (2015), "Operation Research", S. Chand Publications.**
10. **S.D. Sharma (2012), "Operations Research : Theory and Application", Kedar Nath.**
11. Wayne Winston (2003) "Operations Research: Applications and Algorithms", 4<sup>th</sup> Edition,
12. H. Taha (2006) "Operations Research: An Introduction", 9<sup>th</sup> Edition, PHI Private Limited, 2006.

**Additional Resources:**

NPTEL, MIT Video Lectures, Web resources etc.

Evaluation Method		
Item	Weightage	COs
Midterm	30%	CO1, CO2, CO3
Quiz1	20%	CO2
Quiz2		CO1
Quiz3		CO4
Quiz4		CO6
Final Examination	50%	All COs

\*Please note, as per the existing institute's attendance policy the student should have a minimum of 75% attendance. Students who fail to attend a minimum of 75% lectures will be debarred from the End Term/Final/Comprehensive examination.

**CO and PO Correlation Matrix (CSE)**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	2	0	0	2	0	0	0	2	0	3	3	1	0	1
CO 2	2	2	0	0	2	0	0	0	1	0	2	3	1	0	1
CO 3	2	2	0	0	1	0	0	0	1	0	1	3	1	0	1
CO 4	2	2	0	0	1	0	0	0	2	0	3	3	1	0	1
CO 5	2	2	0	0	2	0	0	0	1	0	3	3	1	0	1
CO 6	2	2	0	0	2	0	0	0	1	0	1	3	1	0	1

**CO and PO Correlation Matrix (CCE)**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	2	0	0	2	0	0	0	2	0	3	3	1	0	1
CO 2	2	2	0	0	2	0	0	0	1	0	2	3	1	0	1
CO 3	2	2	0	0	1	0	0	0	1	0	1	3	1	0	1
CO 4	2	2	0	0	1	0	0	0	2	0	3	3	1	0	1
CO 5	2	2	0	0	2	0	0	0	1	0	3	3	1	0	1
CO 6	2	2	0	0	2	0	0	0	1	0	1	3	1	0	1

**CO and PO Correlation Matrix (ECE)**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	2	0	0	2	0	0	0	2	0	3	3	1	0	1
CO 2	2	2	0	0	2	0	0	0	1	0	2	3	1	0	1
CO 3	2	2	0	0	1	0	0	0	1	0	1	3	1	0	1
CO 4	2	2	0	0	1	0	0	0	2	0	3	3	1	0	1
CO 5	2	2	0	0	2	0	0	0	1	0	3	3	1	0	1
CO 6	2	2	0	0	2	0	0	0	1	0	1	3	1	0	1

**CO and PO Correlation Matrix (MME)**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	2	0	0	2	0	0	0	2	0	3	3	1	0	1
CO 2	2	2	0	0	2	0	0	0	1	0	2	3	1	0	1
CO 3	2	2	0	0	1	0	0	0	1	0	1	3	1	0	1
CO 4	2	2	0	0	1	0	0	0	2	0	3	3	1	0	1
CO 5	2	2	0	0	2	0	0	0	1	0	3	3	1	0	1
CO 6	2	2	0	0	2	0	0	0	1	0	1	3	1	0	1

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Last Update: