CVM UNIVERSITY
Aegis: Charutar Vidya Mandal (Estd.1945)

FACULTY OF ENGINEERING & TECHNOLOGY

Effective from Academic Batch: 2022-23

Programme: **Bachelor of Technology (Mechanical Engineering)**

Semester: **VII**

Course Code: **202090707**

Course Title: **Production and Operations Management**

Course Group: **Professional Elective Course -IV**

Course Objectives: This course aims to acquaint students about the concepts, principles, problems, and practices of production and operations management. The course also aims to introduce the students about concept, importance and basic tools & techniques of Lean Manufacturing System.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Theory		J/V/P*		Total
Lecture	Tutorial	Practical		Internal	External	Internal	External	
3	0	0	3	50 / 18	50 / 17	--	--	100 / 35

* **J**: Jury; **V**: Viva; **P**: Practical

Detailed Syllabus:		
Sr.	**Contents**	**Hours**
1	**Introduction:** Nature and Scope of Production/Operations Management, POM Relationship with other Systems in the Organization, Factors that affect System and Concept of Production and Operation Management, Types of Production Systems.	4
2	**Production Scheduling:** Master Production Schedule (MPS), Bills of materials, Capacity Planning, Single Machine Scheduling (Conditions/Assumptions), Definitions of Processing time, Ready Time, Due date, Completion time, Flow time, Lateness, Tardiness, Mean flow time, Mean tardiness, Shortest Processing Time (SPT) Rule to minimize mean flow rate, Weighted Mean flow rate, Earliest Due Date (EDD) Rule to minimize maximum lateness, Johnson's Algorithm for 2 machines n jobs problems, Job Shop Scheduling (Introduction, Graphical solution of 2 jobs and M machines).	10

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3	**Demand Management & Forecasting:** Types of Demands, Types of Forecasting Methods, Factors affecting forecasting, Demand patterns and selection of forecasting techniques, Measures of forecast accuracy [Mean Absolute Deviation (MAD), Mean Square Error (MSE), Mean Forecast Error (MFE), Mean Absolute Percent Error (MAPE)], Forecasting Methods (Quantitative and Qualitative), Simple Moving Average, Weighted Moving Average, Single Exponential Smoothing, Double Moving Average, Double Exponential Smoothing, Simple Regression.	**10**
4	**Materials and Manufacturing Management:** Introduction and Meaning, Scope and Functions of Materials Management, Material Planning and Control, Purchasing, Stores Management, Material Requirement Planning (MRP), Manufacturing Resource Planning (MRPII), Just-In-Time (JIT) Manufacturing system.	**8**
5	**Quality Management:** Total Quality Management: Basic Philosophy, Approach, Implementation Requirements & Barriers, 7 New Quality Management Tools, Quality Function Deployment (QFD), Failure Mode & Effect Analysis (FMEA), Cost of Quality (COQ) system. Introduction to Total Productive Maintenance (TPM): Pillars of TPM, concept of Overall Equipment Effectiveness (OEE).	**7**
6	**Lean Manufacturing System:** Comparison of Push and Pull production system, Lean Principles, Types of Wastes, Types of activities – Value Added, Non-Value Added and Necessary but Non-Value Added activities, Common tools and techniques: 5S, Kaizen, Poka-yoke, SMED.	**6**
	Total	**45**

Reference Books:

1	Chary S N, Production and Operations Management; TMH, Delhi, 2007.
2	Buffa. E S, Modern Production Management; John Willey, New York 1993
3	Richard B Chase, Ravi Shankar, F.R. Jacobs, N.J. Aquilano, Operations and Supply Management TMH, Delhi, 2018
4	R Panneerselvam Book, Production and Operations Management, PHI New Delhi, 2012.
5	K Aswathappa, Production and Operations Management, TMH, Delhi, 2015.
6	William J Stevenson, Operation Management, TMH, New Delhi, 2009
7	Dale H. Besterfield, Carol Besterfield, Total Quality Management; Pearson, 2018
8	S Anil Kumar, N Suresh, Production & Operations Management; New Delhi, New Age International Publisher, 2008.

Supplementary learning Material:	
1	NPTEL resources

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Pedagogy:

- Direct classroom teaching
- Audio Visual presentations/demonstrations
- Assignments/Quiz
- Interactive methods
- Industrial/ Field visits

Internal Evaluation:

The internal evaluation comprised of written exam (40% weightage) along with combination of various components such as Certification courses, Assignments, Mini Project, Simulation, Model making, Case study, Group activity, Seminar, Poster Presentation, Unit test, Quiz, Class Participation, Attendance, Achievements etc. where individual component weightage should not exceed 20%.

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks in %						**R**: Remembering; **U**: Understanding; **A**: Applying; **N**: Analyzing; **E**: Evaluating; **C**: Creating
R	**U**	**A**	**N**	**E**	**C**	
10%	20%	20%	20%	20%	10%	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Students will understand the elements of production and operations management and learn and the concepts of MPS, Scheduling and Sequencing.	**20**
CO-2	Students will understand and apply various demand forecasting techniques.	**20**
CO-3	Students will understand and apply techniques of materials requirements planning & control.	**20**
CO-4	Students will get acquainted to and will be able to apply the concepts of Quality management.	**20**
CO-5	Students will get acquainted to and will be able to apply the concepts of Lean Manufacturing System.	**20**

Curriculum Revision:	
Version:	2
Drafted on (Month-Year):	June-2022
Last Reviewed on (Month-Year):	--
Next Review on (Month-Year):	June-2025

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