

COURSE TITLE	COMPUTER AIDED PRODUCTION MANAGEMENT
COURSE CODE	01CA1211
COURSE CREDITS	3

Objective:

- 1 This course aims to provide an overview of production management, focusing on the computer aided tools applicable in managing automated production. It comprehends about the production systems, facility location and layout, production planning and control, Materials resource planning, scheduling, shop floor control, Simulation of Machine shop and modern approaches.

Course Outcomes: After completion of this course, student will be able to:

- 1 Use various production and operations management techniques in real-world applications to improve efficiency and decision-making.
- 2 Design, analyze, and evaluate production planning and control systems, including those in distributed manufacturing environments.
- 3 Develop simulation models of a machine shop.
- 4 Apply the concepts of computer-aided production management for various industrial applications.

Pre-requisite of course: Zeal to learn the subject

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	0	0	50	30	20	0	0

Contents : Unit	Topics	Contact Hours
1	Fundamentals System concept, Hierarchical structure, System design, Decision making procedure, , Manufacturing Systems, Factors affecting selection of Manufacturing Process, , Modes of Production- Jobbing / Intermittent /Continuous/ Mass Production.	2
2	Product / Process Planning and Design Facilities (Plant) Location - Facility location and layout – Factors considerations in Plant location. , Comparative Study of rural and urban sites – Methods of selection plant layout – objective of good layout – Principles – Types of layout. , Computerized relative allocation of facility technique, , automated layout design program and computerized relationship layout planning for facility location and layout.	10

Contents : Unit	Topics	Contact Hours
3	MRP Material Requirement – Terminology – types of demands., inputs to MRP- techniques of MRP – Lot sizing methods – benefits and drawbacks of MRP., Manufacturing Resources Planning (MRP –II).	4
4	Job scheduling Scheduling – Policies – Types of scheduling – Forward and Backward Scheduling., Gantt Charts –Flow shop Scheduling – n jobs and 2 machines, n jobs and 3 machines – job shop Scheduling., 2 jobs and n machines – Line of Balance.	6
5	Computer Aided Process Planning Generative and variant types, backward and forward approach., Feature based and CAD based CAPP.	4
6	Shop Floor Control Database structures, hierarchical, network, Relational concepts, keys, relational operations, , query languages; Shop Floor Data Collection Systems-Types of data, on-line and off-line data collection., Automatic data collection systems.	6
7	Modern approaches in Manufacturing Cellular Manufacturing- Group Technology, Composite part, Rank Order Clustering Technique., Hollier method for GT cell layouts., Flexible Manufacturing- Concept, principles, , Lean manufacturing concept, principles.	6
8	Simulation in Manufacturing system Major activities, purpose, simulation process, type’s methodology, simulation packages, , process quality simulator, computer requirements trends, applications simulation of machine shop. , Suggested Specification table with Mark	4
Total Hours		42

Textbook :

- 1 Production & operations management: Concepts, Models and Behavior, Adam E.(Jr.), Ebert R J.,, PHI, 2019
- 2 Production & operations management, Chary S N, McGraw-Hill, 2019

References:

- 1 Computer Aided Production Management, Computer Aided Production Management, Mahapatra P B, PHI, 2004
- 2 Manufacturing Processes, Manufacturing Processes, Kalpakjian, Pearson, 2018
- 3 Facility Layout & location – An analytical approach, Facility Layout & location – An analytical approach, Richard L. Francis, John A. White, Pearson, 2015
- 4 Production & operations management, Production & operations management, Nair G N, McGraw-Hill, 2012
- 5 An Introduction to Computer Aided Production Management, An Introduction to Computer Aided Production Management, Childe , S., Springer, 1997

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation

Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
20.00	20.00	20.00	20.00	10.00	10.00

Instructional Method:

- 1 Direct teaching, Digital Presentations, Case Studies

Supplementary Resources:

- 1 <http://nptel.ac.in>