GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Engineering
Subject Code: 3720814
Semester –II
Subject Name: COMPUTER AIDED PRODUCTION MANAGEMENT

Type of course: Core IV

Prerequisite: Zeal to learn the subject

Rationale: 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.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs
1	**Fundamentals:** System concept, Hierarchical structure, System design, Decision makingprocedure, Manufacturing Systems, Factors affecting selection of Manufacturing Process, Modesof Production- Jobbing / Intermittent /Continuous/ Mass Production.	02
2	**Product / Process Planning and Design :** Facilities (Plant) Location - Facility location and layout – Factors considerations in Plant location- Comparative Study ofrural and urban sites – Methods of selection plant layout – objective of good layout – Principles – Types of layout. Computerized relative allocation of facility technique, automated layoutdesign program and computerized relationship layout planning for facilitylocation and layout.	12
3	**MRP :** Material Requirement – Terminology – typesofdemands – inputs to MRP- techniques of MRP – Lot sizing methods – benefits and drawbacks of MRP –Manufacturing Resources Planning (MRP –II).	04

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 jobsand n machines – Line of Balance.	**06**
5	**Computer Aided Process Planning:** Generative and variant types, backwardand forward approach, feature based and CAD based CAPP.	**04**
6	**Shop Floor Control:** Database structures, hierarchical, network, Relationalconcepts,keys, relational operations, query languages; Shop Floor Data Collection Systems-Types of data, on-line and off-line data collection, Automatic data collection systems.	**06**
7	**Modern approaches in Manufacturing:** Cellular Manufacturing- Group Technology, Compositepart, Rank Order Clustering Technique, Hollier method for GT cell layouts; FlexibleManufacturing- Concept, principles, Lean manufacturing concept, principles.	**06**
8	**Simulation in Manufacturing system :** Major activities, purpose, simulation process, typesmethodology, simulation packages, process quality simulator, computer requirements trends, applications simulation of machine shop.	**04**

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	**10**	**30**	**20**	**20**	**10**

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

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.

Reference Books:

1. Production & operations management:Concepts, Models and Behaviour, Adam E.(Jr.), Ebert R J., PHI.
2. Production & operations management, Chary S N, McGraw-Hill.
3. Computer Aided Production Management,Mahapatra P B, PHI.
4. Manufacturing Processes, Kalpakjian, Pearson

5. Facility Layout & location – An analytical approach – Richard L. Francis, John A. white
6. Production & operations management, Nair G N, McGraw-Hill.
7. An Introduction to Computer Aided Production Management, Childe, S., Springer.

Course Outcomes:

Sr. No.	CO statement	Marks % weightage
CO-1	Understand relevance and importance of the Different Production and operations management techniques and their applications.	25
CO-2	Capable to design, analyse and assess production planning and control systems, including those operating within distributed manufacturing environment.	25
CO-3	Be able to develop simulation of machine shop.	30
CO-4	Gain an overall understanding of computer aided production management.	2o

List of Experiments:

1. Salient features and facilities of ideal software.
2. Algorithm and program for sequencing / scheduling
3. Forecasting methods and program of any one.
4. Group technology
5. Computerized plant layout design
6. Computer aided process planning
7. Material requirement planning
8. Shop floor control

Equipment / Computational facility:
1.Computational Facility and programming software

List of Open Source Software/learning website: https://nptel.ac.in/