

GUJARAT TECHNOLOGICAL UNIVERSITY
B.E. SEMESTER : VII
MANUFACTURING ENGINEERING

Subject Name: Computer Integrated Manufacturing

Subject Code:173403

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam(E)	University Exam(P)	Mid Sem Exam(Theory) (M)	Practical (Internal)
4	0	2	6	70	30	30	20

Sr No	Course Contents
1	INTRODUCTION The meaning and origin of CIM – The changing manufacturing and management scene – External communication – Islands of automation and software – Dedicated and open systems – Manufacturing automation protocol – Product related activities of a company – Marketing engineering – Production planning – Plant operations – Physical distribution – Business and financial management.
2	GROUP TECHNOLOGY History of group technology – Role of G.T. in CAD/CAM integration – Part families – Classification and coding – DCLASS and MICLASS and OPITZ coding systems – Facility design using G.T. – Benefits of G.T. – Cellular manufacturing
3	COMPUTER AIDED PROCESS PLANNING Process planning – Role of process planning in CAD/CAM integration – Approaches to computer aided process planning – Variant approach and generative approaches – CAPP and CMPP process planning systems.
4	SHOP FLOOR CONTROL Shop floor control – Phases – Factory data collection system – Automatic identification methods – Bar code technology – Automated data collection system
5	INTRODUCTION OF FMS FMS – Components of FMS – Types – FMS workstation – Material handling and storage systems – FMS layout – Computer control systems – Application and benefits
6	AUTOMATED MANUFACTURING SYSTEMS Automated production line – system configurations, work part transfer mechanisms – Fundamentals of Automated assembly system – System configuration, Part delivery at workstations – Design for automated assembly – Overview of material handling equipments – Consideration in material handling system design – The 10 principles of Material handling. Conveyor systems – Types of conveyors – Operations and features
7	AGV AND ASRS Automated Guided Vehicle system – Types of vehicles and AGVs applications – Vehicle guidance technology – Vehicle management and safety. Storage system performance – storage location strategies – Conventional storage methods and equipments – Automated storage/Retrieval system and Carousel storage system. Deadlocks in Automated manufacturing systems – Petrinet models – Applications in dead lock avoidance
8	CIM IMPLEMENTATION AND DATA COMMUNICATION

	CIM and company strategy – System modeling tools – IDEF models – Activity cycle diagram – CIM Open System Architecture (CIMOSA) – Manufacturing enterprise wheel – CIM architecture – Product data management – CIM implementation software – Communication fundamentals – Local area networks – topology – LAN implementations – Network management and installations.
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TEXT BOOK

1. Groover, M.P., “Automation, Production Systems and Computer Integrated Manufacturing”, Pearson Education, 2001.

REFERENCE BOOKS

1. Yoram Koren, “Computer Integrated Manufacturing System”, McGraw-Hill, 1983.
2. Ranky, Paul G., “Computer Integrated Manufacturing”, Prentice Hall International, 1986.
3. Groover, M.P and Emory Zimmers Jr., “CAD/CAM”, Prentice Hall of India Pvt. Ltd., 1998.
4. Radhakrishnan P, Subramanyan S. and Raju V., “CAD/CAM/CIM”, 2nd Edition, New Age International
5. . Viswanathan, N., and Narahari, Y., “Performance Modeling and Automated Manufacturing Systems”, Prentice Hall of India Pvt. Ltd., 2000.