

GUJARAT TECHNOLOGICAL UNIVERSITY

MECHANICAL ENGINEERING

B. E. SEMESTER: VII

Subject Name: **Computer Integrated Manufacturing**

Subject Code: **171903**

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam (E)		Mid Sem Exam (Theory) (M)	Practical (Internal)
				Theory	Practical		
3	0	2	5	70	30	30	20

Sr. No	Course Content	Total Hrs.
1.	Introduction to CIM Concepts & scope of CIM, Nature & type of manufacturing system, Evolution, Benefits of CIM,	3
2.	Numerical Controls, types, evolution of controllers, components of NC/CNC system, specification of CNC system. Classification of NC /CNC machines, transducers used, salient features, Tape, Tape codes and tape readers used in NC machines, constructional details of CNC machines, axis designation, NC/CNC tooling. Fundamentals of manual part programming, types of format, word address format manual part Programming for drilling, lathe and milling machine operations, subroutines, do loops, canned Cycles, parametric sub routines. Programmable Logic Controllers (PLCs) Automated Programmed Tools language- its types of statement, command and programming.	12
3.	GROUP TECHNOLOGY: Introduction, part families, part classification and coding, machining cells, benefits of group technology.	4
4.	FMS: Introduction & Component of FMS, Needs of FMS, general FMS consideration, Objectives, Types of FMS, advantages of FMS, Automated material movement & AS/RS AGVS , RGV Manufacturing Cells, Cellular & Flexible manufacturing, JIT & GT applied to FMS, FMC & FMS, Tool Management, Tool supply system, Tool Monitoring System, Work piece Handling, Flexible Fixturing, Flexible Assembly Systems, Flexibility. FMS scheduling, sequencing, FMS lay out and essentials	6
5.	Robot Technology: Introduction, Industrial Robots, Robot physical Configuration, Basic Robot motions, Robotic Power sources, Sensors, Actuators, Transducer and Grippers. Technical features, such as work volume, precision of movement	10

	speed o movement, weight carrying capacity, Programming of the robot, Introduction to robot languages, End erectors, work cell control and interlocks, Robot applications & economics, Intelligent robots, interfacing of a vision system with a Robot.	
6.	CIM ADVANCES: Role of management in CIM, Expert system & participate management, Impact of CIM on personnel, Role of manufacturing engineers, CIM Wheel.	4
7.	COMPUTER AIDED PRODUCTION MANAGEMENT: Introduction, PPC fundamentals, Problems with traditional PPC, use of computer in PPC such as CAPP, MRPI, MRPII, CAGC etc.	6

Term Work:

The term work shall be based on the topics mentioned above.

Practical / Oral:

The candidate shall be examined on the basis of term-work.

Text Books:

1. Computer Aided Manufacturing by Tien Chien Chang, Pearson Education
2. Automation, Production Systems and Computer Integrated Manufacturing by by Groover, Pearson Education

Reference Books:

1. CNC programming – Dr. S.K.Sinha – Golgotia publications.
2. Flexible Manufacturing Cells and System -William. W. Luggen Prentice Hall, England Cliffs, New jersy
3. P.Radhakrishnan, " Computer Numerical Control ", New Central Book Agency, 1992.
4. Computer integrated manufacturing -S. Kant Vajpayee – Prentice Hall of India.
5. Computer Aided Manufacturing- Rao, Tewari, Kundra, McGraw Hill, 1993
6. CAD/CAM, Principles and Applications –P N Rao, McGraw Hill, 2010
7. CAD/CAM, Introduction, -Ibrahim Zeid, Tata McGraw Hill, 2007
8. CAD/CAM, Groovers and Zimmers, Pearson