

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. SEMESTER: VII

PRODUCTION ENGINEERING

Subject Name: **Computer Aided Manufacturing**

Subject Code: **172501**

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

Sr. No	Course Content	Total Hrs.
1.	Introduction Limitation of Conventional Mfg., Introduction and Definition of Computer Aided Manufacturing- CAM	1
2.	Introduction to Numerical Control Introduction, NC machines, CNC machines, Direct Numerical Control (DNC), Advantages of CNC machines, Disadvantages of CNC machines, Factors affecting selection of components for machining on CNC machine tools.	6
3.	Components of NC system Basic components of NC system, Types of input media for NC, Representation of the ISO & EIA Numerical Control code in punched tape, Parity Checking, Classification of program readers on the basis of program, Input medium, Basic steps of NC procedure.	7
4.	Classification of NC machines Classification on the base of feedback control system, classification on the base of control system features, Types of feedback devices, Methods of listing co-ordinates of points, Axis identification in NC/CNC machines.	6
5.	Construction of CNC machines Introduction, Machine structure, slide ways, spindle, drive units	4
6.	Part Programming Introduction, NC words, Interpolation, Programming formats, Writing a part program for lathe, drilling and milling operations, Cutter radius compensation, Zero points and reference points, Use of sub routines, Do	10

	loops and Canned cycles, Adaptive control	
7.	Introduction to Robotics Introduction, Basic elements of a robot, Classification of robot, Physical configuration of robot, Basic robot motions, Technical features, Actuators, Sensors, Robot application.	6
8.	Computer Integrated Manufacturing Introduction to CIM, Elements of CIM, CIM wheel, Benefits of CIM, Concepts of FMS, Automatic Storage and Retrieval System (AS/RS), Automated Guided Vehicles (AGVs Group Technology(GT), Computer Aided Process Planning (CAPP), Co-Ordinate Measuring Machine (CMM).	8
9.	Mechatronics Introduction, Role of Mechatronics in Manufacturing, Elements, procedure, benefits and applications	4
10.	Rapid Prototyping Role of RPT, Two Dimensional Layer by layer techniques-Stereo Lithography, Selective Laser Sintering, Selective Powder Binding, Fused Deposition, LOM.	6

Text Books:

1. NC of Machine Tool ,By T.K. Kundra, P.N. Rao, N.K. Tiwari.
2. Rapid Prototyping A brief Introduction by Amitabh Ghosh
3. CNC Machines by M. Adithan & B. S. Pabla, New AgePublishers

Reference Books:

1. Robotics for Engineer By Y. Koren, McGraw Hill
2. CAD/CAM- Computer Aided Design By Mikell, P. Groover & E.W. Manufacturing Zimmers (Prentice Hall)
3. CAD/CAM/CIM by Radhakrishnan New Age International Publication.
4. Mechatronics by HMT Ltd., TMH
5. Robotic Technology & Flexible Automation by S.R.Deb, TMH Publication