

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme		Bachelor of Technology			Branch/Spec.		Mechanical Engineering		
Semester		VIII			Version		2.0.0.0		
Effective from Academic Year			2021-22		Effective from the batch Admitted in				July 2018
Subject code		2ME8103		Subject Name		Computer Aided Manufacturing			
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	1	0	4	Theory	40	60	100
Hours	3	0	2	0	5	Practical	30	20	50
Pre-requisites:									
Manufacturing Processes, Production Technology									
Course Objective:									
<ul style="list-style-type: none"> ● Learn the Basics of manufacturing systems and CNC machines ● Understand Constructional features of CNC machines ● Understand Automation Systems and Material handling systems ● Understand Computer aided production planning ● Develop part programming for Lathe and milling operations. 									
Theory syllabus									
Unit	Content								Hrs
1	FUNDAMENTALS OF CNC MACHINES: CNC Technology - Functions of CNC Control in Machine Tools - Classification of CNC systems - CNC Controllers, Hardware features - Direct Numerical Control (DNC Systems), Adaptive control system.								4
2	CONSTRUCTIONAL FEATURES OF CNC MACHINES: Design considerations of CNC machines for improving machining accuracy-Structural members-Slide ways - Sides linear bearings - Ball screws - Spindle drives and feed drives - work holding devices and tool holding devices -Automatic Tool changers. Feedback devices - Principles of Operation-Machining Centres - Tooling for CNC machines.								9
3	PART PROGRAMMING FOR CNC MACHINE: Numerical control codes - Standards - Manual Programming - Canned cycles and subroutines - Computer Assisted Programming, CAD / CAM approach to NC part programming - machining from 3D models.								8
4	FMS & MATERIAL HANDLING AND STORAGE SYSTEM: Introduction to FMS, types, applications and benefits, FMS - components, Layout Configurations, implementation, Automated material handling systems, conveyor system, Automated guided vehicles, pallets, Bar code Render, Walking Beam theory, Automated storage and retrieval systems, Carousel storage system.								8
5	COMPUTER AIDED PROCESS PLANNING: Need, Types, Benefits, CAPP and expert system, computerized database machinist system.								4
6	INDUSTRIAL ROBOTICS: Introduction to Industrial Robots, Robot physical Configuration, Basic Robot motions, Elements of robots, Robot programming, Integration and application in manufacturing								6
7	RAPID PROTOTYPING: Introduction, Methods of rapid prototyping (subtraction, addition), Stereo lithography, rapid tooling, FDM, 3-D Printing, LOM and SLS.								6

Practical content	
The term work shall be based on experimental and analytical work on topics mentioned above.	
Text Books	
1	Mikell P.Groover, "Automation, Production Systems and Computer Integrated Manufacturing" Pearson Education Asia, 4 th Edition
2	Radhakrishnan, "CAD/CAM /CIM"- Tata McGraw Hill, New Delhi. 3 rd Edition
Reference Books	
1	T.K. Kundra, P.N. Rao and N. Tewari, "Numerical Control and Computer Aided Manufacturing", Tata McGraw Hill, New Delhi. 2009
2	Peter Smid, "CNC Programming", New York. 3 rd Edition
3	HMT "Mechatronics" Tata McGraw Hill, New Delhi. 2008
4	James Madison, "CNC Machining Hand Book", Industrial Press Inc., New York, 1996.
5	Hans B. Kief and Frederick Waters, T., "Computer Numerical Control - A CNC Reference Guide", Macmillan / McGraw-Hill, New York, 1992.
MOOCs Link	
	https://nptel.ac.in/courses/112/102/112102103/ - Computer Aided Manufacturing
	https://nptel.ac.in/courses/112/104/112104289/ - Computer Integrated Manufacturing
Course Outcomes:	
After learning this course, student should be able to	
<ol style="list-style-type: none"> 1. Understanding of Computer Aided Manufacturing (CAM) systems. 2. Learn the fundamental of CNC Codes and Programming on CNC Machines 3. Understand the basic of Computer Aided Process Planning (CAPP) Systems, Robotic Systems. 4. Students will cultivate understanding about Automated Material Handling Systems, Flexible Manufacturing Systems(FMS) 	