

Branch Name:	Mechanical Engineering (CAD/CAM)
Program Code:	ET201
Course Name:	Computer Aided Manufacturing
Course Code:	2ET2010201T
Pre-requisite Course:	Zeal to learn the subject

Course Objectives:

1. Acquire fundamental understanding of the principles of CAD/CAM, including engineering drawing, geometric and surface and feature-based design
2. Applying CAD/CAM concept to product design and manufacturing
3. Exposure to CAD/CAM softwares.

Teaching and Examination Scheme:

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								
					Theory (Marks)				Practical (Marks)				Total (Marks)
	SEE		CCA		SEE		CCA						
	L	T	P	Total	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
4	4	-	-	4	24	60	16	40	-	-	-	-	100

Subject Contents:

Sr. No	Topic	Total Hours	Weightage (%)
1	Fundamentals of Numerical Control: Need and future of NC Systems, Principles and Types of NC, Design Features of NC M/c Tools; Machining Centre;	04	16
2	NC Part Programming: Manual, computer Assisted-APT, EXAPT, ADAPT and CAD based Part Programming	04	16
3	Feedback Devices: Resolvers, Encoders, and Inductosyns	04	16
4	Actuation Systems- Hydraulic, Pneumatic and Electromechanical	04	16
5	Computer Control and Adaptive Control System-CNC, DNC and AC	04	16
6	Flexible Manufacturing Systems: Concept and Classification, Types of Flexibility, pallets, fixtures, work handling systems, simulation and analysis in the design of FMS;	05	20

Review Presentation:

The student is expected to spend minimum 2 hours per week (as mentioned in the teaching and evaluation scheme) to refer at least two peer reviewed journal papers related to this domain/subject. The student is expected to identify issues/challenges and emerging trends in the domain/subject. Student is supposed to explore various video lectures (E.g. NPTEL) available in the domain/subject. Student is required to make a review-presentation on the work carried out for the same. Recommended

sites for journal papers are (1) asmedigitalcollection.asme.org (2) springer.com (3) sciencedirect.com (4) ieeexplore.ieee.org (5) scholar.google.co.in or others of similar repute.

List of Reference Books:

1. CNC Programming, S.K.Sinha , Galgotia Publications
2. Automation, Production Systems and Computer Integrated Manufacturing , Groover M.P., Third Edition, Prentice-Hall, 2007
3. Parametric and feature based CAD/CAM, Shah J.J., Mäntylä M., 1995, John Wiley Sons Inc. Mechatronics, HMT, McGraw Hill Education
4. Introduction to Computer Numerical Control , James V. Valentino and Joseph Goldenberg, 5th ed, Prentice Hall, Englewood Cliff, New Jersey, 2012.
5. Computer control of Manufacturing Systems, Yoram Koren, , McGraw Hill, 2006
6. Numerical Control and Computer Aided Manufacturing, T.K. Kundra, P.N.Rao, N.K. Tewari, Tata McGraw Hill Publishing Company Ltd.
7. CNC Machining and Programming: An Introduction ,David Gibbs and Thomas Crandall, , Industrial Press Inc., 2003

E-Resources:

1. nptel.ac.in/courses/112106175/

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	understand the basic principles of part programming for CNC machining	2 Understanding
CLO2	select and apply appropriate operations, cutting parameters, cutting tools and software to machine a part	3 Applying
CLO3	create and optimize a part program using programming concepts for practical applications	6 Creating
CLO4	execute part program to produce quality part on CNC machine	4 Analyze
CLO5	learn Computer Control and Adaptive Control System-CNC, DNC and AC	1 Remembering
CLO6	understand the basic concept, components and design of FMS	2 Understanding

Mapping of CLOs with POs & PSOs:

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes(PSOs)	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CLO1	H												L	
CLO2		L	M	M									L	
CLO3					L				M		L			M
CLO4			M	M									M	
CLO5			M	M										M
CLO6											M			M

H: High, M: Medium, L: Low