

1. Preamble

To study how computer can be applied in mechanical engineering design

2. Pre-requisite

NIL

3. Course Outcomes

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
C01	Explain the basic concepts and underlying theory of modeling and the usage of models in Automobile applications	K2
C02	Explain the homogenous transformation of 2D and 3D curves and surfaces	K2
C03	Compare the different types of modeling techniques and explain the central role solid models play in the successful completion of CAD/CAM-based product development	K2
C04	Describe the manufacturing planning and control	K2
C05	Explain the process planning and shop floor control using CAD/CAM	K2

4. Correlation with Programme Outcomes

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	H	H	H	M	L	H							H	H
CO2	H	H	H	M	L	H							M	H
CO3	H	H	H	M	L	H							H	H
CO4	H	H	H	M	L	H							L	L
CO5	H	H	H	M	L	H							M	H

H- Strong; M-Medium; L-Low

5. Course content**UNIT I INTRODUCTION TO CAD/CAM****L-9**

The Design Process Morphology of Design, Product Cycle Computer Aided Design, Benefits of CAD. Basic Concepts of CAD - Principles of Computer Graphics. CAD/CAM Data Base Development and Data Base Management Systems. Programming And Interface Hardware – Computer Aided Process Monitoring - Adaptive Control, On-Line Search Strategies.

UNIT II CURVES & SURFACES AND 2D & 3D TRANSFORMATION**L-9**

Analytic Curves and Surfaces, 2D Homogenous Transformations- Translation, Rotation, Reflection, Scaling, Shearing and Combined Transformation 3D Homogenous Transformation - Translation, Rotation, Reflection, Scaling, Shearing and Combined

Transformation 3D Viewing Transformation – Panning, Rotation, Reflection, Shearing and Zooming.

UNIT III COMPUTER AIDED DRAFTING AND SOLID MODELING L-9

Graphic Software - Coordinate Representation - Graphic Functions, Software Standards. Graphical Kernel System (GKS) - Initial Graphics Exchange System (IGES) - Graphic Packages. Geometric Modeling - Wire Frame, Surface and Solid Models - CSG and B-REP Techniques - Features of Solid Modeling Packages.

UNIT IV COMPUTER AIDED MANUFACTURING L-9

Manufacturing Planning and Control - CAD/CAM Integration - Principles of Computer Integrated Manufacturing - Hierarchical Network of Computers – Local Area Networks - Process Planning - Computer Aided Process Planning – Retrieval and Generative Approaches.

UNIT V COMPUTER AIDED PROCESS PLANNING AND SHOP FLOOR CONTROL

L-9

Computer Integrated Production Management System - Master Production Schedule - Material Requirement Planning - Inventory Management - Manufacturing and Design Data Base - Capacity Planning - Shop Floor Control - Functions - Order Release – Order Scheduling - Order Progress - Factory Data Collection.

6. Text Books

1. Radhakrishnan. P, Subramanyan. S, Raju. V, CAD/CAM/CIM, New Age International Publishers(P) Ltd., 2006.

7. References

1. Groover. M. P, Automation, Production Systems and Computer Integrated Manufacturing, Prentice Hall, 2007.
2. Mortenson, M, E, “Geometric modeling”, John Willey & Sons, 1985.
3. Roger.D.F and Adams.J.A, “Mathematical elements of computer graphics”, McGraw Hill, 1990.
4. Ibrahim Zeid, “CAD/CAM Theory and practice”, TATA McGraw hill corporation co.ltd,1988.
5. Hearn, Donald and Pauline Baker. M, “Computer Graphics”, Prentice Hall, 1986.