

I Year M.Tech. CAD/CAM/CAE Semester - I	L	T	P	Tot.	C
	3	1	-	4	4
(ME 549) COMPUTER AIDED DESIGN					

Objective of the Course :

To improve knowledge in geometrical modeling for surfaces and solids with the help of computer design modeling methods.

UNIT - I

CAD: Introduction, benefits of CAD, conventional design vs CAD, CAD system architecture, Hardware and software for CAD, Software. Modules, ICG, Graphics Software, Ground rules for design of GS, functions of GS, modeling and Simulation,

UNIT - II

An overview of modeling software: like UG/NX, Solid Works, Autodesk Inventor, Professional, AutoCAD, PRO/E, CATIA: Capabilities, Modules, Coordinate systems, Sketching tools, solid modeling tools, surface modeling tools, expression/parameters toolbox, data exchange tools, API and customization facilities

Geometric transformations: 2D and 3D; transformations of geometric models like translation, scaling, Rotation, reflection, shear; homogeneous representations, concatenated representation; Orthographic Projections

UNIT - III

CAD/CAM Data exchange and data storage: Introduction, graphics and computing standards, data Exchange standards like IGES, STEP, Model storage

Mathematical representations of solids: Fundamentals, Solid models, Classification of methods of representations, half spaces, boundary representation, CSG, sweep representations, Octree representations, primitive instancing, cell decomposition, spatial occupancy enumeration

UNIT - IV

Mathematical representations of curves and surfaces: Curve representation, Parametric representation of analytic and synthetic curves; Surface models, Surface representations, Parametric representation of analytic and synthetic surfaces

UNIT – V

Assembly modeling: Representation, mating conditions, representation schemes, generation of assembling Sequences.

AI approaches and applications in CAD, Knowledge Based Engineering, Introduction to Advanced visualization topics in CAD like Modern representation schemes like FBM, PM, Feature recognition, Design by features,

TEXT BOOKS:

1. Chris McMahon and Jimmie Browne, CAD/CAM – Principle Practice and Manufacturing Management, Addison Wesley England, Second Edition, 2000.
2. Ibrahim Zeid, CAD/CAM theory and Practice, Tata McGraw Hill Publishing Co. Ltd., New Delhi, 1992.
3. Dieter George, Engineering Design – A materials and processing approach, McGraw Hill Publishers, 2000

REFERENCE BOOKS:

1. Rogers, D.F. and Adams, A., Mathematical Elements for Computer Graphics, McGraw Hill Inc, NY, 1989.
2. P. Radhakrishnan, S. Subramanayan and V.Raju, CAD/CAM/CIM, New Age International (P) Ltd., New Delhi.
3. Groover M.P. and Zimmers E. W., CAD/CAM: Computer Aided Design and Manufacturing, Prentice Hall International, New Delhi, 1992.
4. Dr. Sadhu Singh, Computer Aided Design and Manufacturing, Khanna Publishers, New Delhi, Second Edition, 2000.