

Year & Sem:	Course Code: ME3517	Course Name: CAD/CAM and Lab	No. of Credits: 4	L	T&PS	P
				2	2	0

LIST OF EXPERIMENTS:

- I. Introduction to CAD software.
- II. II. 2D drafting using Auto CAD / Iron CAD (Two exercises)
- III. III. 3D modeling using Pro-E or CATIA or Solid Works or Iron CAD or Auto CAD
(Any four exercises from the following)
 - a. Modeling of Component in 3D - V block
 - b. Modeling of Component in 3D - Open Bearing
 - c. Modeling of Component in 3D - Angular block
 - d. Modeling of Component in 3D - Dovetail Guide
 - e. Modeling of Component in 3D - Dovetail Bracket
 - f. Modeling of Component in 3D - Dovetail stop
- IV. Assembly Modelling: Student must do at least two exercises by using Pro-E or CATIA or Solid Works or Iron CAD or Auto CAD
 - a. Assembly of a screw jack parts
 - b. Assembly of a knuckle joint
 - c. Assembly of a Oldham's coupling
 - d. Assembly of a footstep bearing
 - e. Assembly of a stuffing box
 - f. Assembly of a square tool post

CAD/CAM

UNIT I: Overview of CAD/CAM: Product cycle, CAD, CAM and CIM. CAD Tools, CAM Tools, Utilization in an Industrial Environment, Evaluation criteria. CAD standards, CAD data structure, Data base management systems. Computer Graphics: Co-ordinate systems, Graphics package functions, 2D and 3D transformations, homogeneous transformations, clipping, hidden line / surface removal colour, shading.

UNIT II: Geometric Modeling: Representation techniques, Parametric and non parametric representation, various construction methods, wire frame modeling, synthetic curves and their representations, surface modeling, synthetics surfaces and their representations. Solid modeling, solid representation, fundamentals, introduction to boundary representations, constructive solid geometry, analytical solid modeling.

UNIT III: Numerical Control: NC, NC Modes, NC Elements, NC Machine tools and their structure, Machining centre, types and features. Controls in NC, CNC systems, DNC systems. Adaptive control machining systems, types of adaptive control. CNC Part Programming: Fundamentals, NC word, NC Nodes, canned cycles, cutter radius compensation, length compensation, computed assisted part programming using APT: Geometry statements, motion statements, post process statements, auxiliary statements, macro statement program for simple components.

UNIT IV: Group Technology & FMS: Part Family, Classification and Coding, advantages & limitations, Group technology machine cells, benefits. FMS: Introduction, components of FMS, material handling systems, Computer control systems, advantages. Computer Aided Quality

Control: Terminology in Quality control, Inspection and testing, Contact inspection methods - optical and non-optical, integration of CAQC with CAD and CIM

UNIT V: Computer Aided Processes Planning: Retrieval type and Generative type, benefits Machinability data systems, Computer generated time standards. Computer Integrated Production Planning: Capacity planning, shop floor control, MRP-I, MRP-II, CIMS benefits. Trends In Manufacturing Systems: Concepts of Reconfigurable manufacturing, Sustainable manufacturing and lean manufacturing.

Reference Books:

1. Mastering CAD/CAM / Ibrhim Zeid / Mc Graw Hill International.
2. CAD/CAM Principles and Applications/ P.N.Rao/TMH/3rd Edition
3. CAD/CAM /Groover M.P./ Pearson education
4. CAD/CAM Concepts and Applications/ Alavala/ PHI

Lecture Plan: Unit-I & -II syllabus for MID-I, Unit-III & -IV syllabus for MID-II and Unit-V & -VI syllabus for MID-III examinations.

Video Lectures (Web Links):

- 1.
- 2.

Study Materials (Web Links):

- 1.
- 2.

Problems & Solutions (Web Links):

- 1.
- 2.

Assignments (Web Links):

- 1.
- 2.