



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

COMPUTER AIDED DESIGN/ COMPUTER AIDED MANUFACTURING (CAD/CAM) LABORATORY								
VII Semester: ME								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
AMEC48	Core	0	0	3	1.5	30	70	100
Contact Classes: Nil		Tutorial Classes: Nil		Practical Classes: 24		Total Classes: 24		
Prerequisite: Design and Manufacturing								
I. COURSE OVERVIEW:								
<p>Computer aided Design/ Computer aided Manufacturing (CAD/CAM) laboratory is a course primary important to mechanical engineering students. The aim is to impart the overview of computer applications or design and manufacturing the discrete engine components, assemblies and final product to meet the global competition. The course covers the life cycle of a product describes the product model generation, analysis structural, thermal, dynamic behaviors. This course also deals with creation of synthetic curves and surfaces. It imposes the knowledge of latest manufacturing techniques using CNC/DNC Machines centers with different CNC programming methods, Manufacturing processes, Group Technologies.</p>								
II. COURSE OBJECTIVES:								
The students will try to learn:								
<p>I. The 2D drawings of machine components and modify commands for simple geometric assemblies</p> <p>II. The 2D Sectinal views for part drawing and assemblies, and generation of 2D, 3D models through different features</p> <p>III. The Simulation software used for anlyse stresses in various beams and truss</p> <p>IV. The fundamentals of CNC turning and milling, Part programming and interpolation techniques using CAM software.</p>								
III. COURSE SYLLABUS:								
Week-1: INTRODUCTION TO CAD SOFTWARE								
Batch 1 & Batch2:Familiarization and practicing of drawing and modifying commands, template creation, lettering, object snapping and sectioning.								
Week-2: DRAFTING OF SIMPLE 2D DRAWINGS								
Batch 1 & Batch2:Prepare the 2D drawings using draw and modify commands for simple geometric assemblies, sectional views for part drawing and assemblies.								
Week-3: SOLID MODELING								
Batch 1 & Batch2: Preparing the 2D and 3D models (wire frame, surface and solid models) by using B-REP, CSG. Introduction of Boolean operations. Generation of 2D, 3D models through protrusion, revolve, sweep.								
Week-4: CREATING ORTHOGRAPHIC VIEWS FROM SOLID MODELS								
Batch 1 & Batch2: Development of orthographic views for assembly drawings and preparation of bill of materials (IC engine components, Machine tool accessories, Jigs and Fixtures).								
Week-5: INTRODUCTION TO SIMULATION SOFTWARE								
Batch 1 & Batch2: Basic commands used in Simulation Software (Eg. Ansys, Hyperworks, etc.) and related simulation methodologies.								

Week-6: SIMPLE BEAM

Batch 1 & Batch2: Determination of deflection and stresses in bar.

Week-7: TRUSSES

Batch 1 & Batch2: Simulation and analysis of a truss.

Week-8: CANTILEVER BEAM-1

Batch 1 & Batch2: Simulation and analysis of a cantilever beam with load.

Week-9: CANTILEVER BEAM-2

Batch 1 & Batch2: Simulation and analysis of a cantilever beam with UDL.

Week-10: INTRODUCTION TO CAM

Batch 1 & Batch2: Basic fundamentals of CNC milling, familiarization of machine control panel, Part programming and interpolation techniques using CAM software.

Week-11: CNC MILLING

Batch 1 & Batch2: Machining practice on CNC milling.

Week-12: CNC TURNING

Batch 1 & Batch2: Machining practice on CNC Turning

V. TEXT BOOKS:

1. IbrahimZeid, "MasteringCAD/CAM", McGraw-Hill, 1st Edition, 2007.
2. William M Neumann and Robert F.Sproull, "Principles of Computer Graphics", McGraw-Hill Book Co. Singapore, 1st Edition, 1989.
3. Groover M. P, Zimmers. E. W., "CAD/CAM: Computer Aided Design Manufacturing", Pearson Education India, 1st Edition, 2006.

VI. REFERENCE BOOKS:

1. YoramKoren, "ComputerControlof ManufacturingSystems", McGraw-Hill, 1st Edition, 1983.
2. K. Lalit Narayan, K. Mallikarjuna Rao and M.M.M. Sarcar, "Computer Aided Design Manufacturing", PHI, 1st Edition, 2008.

VII. WEB REFERENCES:

1. <https://nptel.ac.in/courses/112/102/112102101/>
2. <https://nptel.ac.in/courses/112/102/112102103/>