

## COMPUTER AIDED DESIGN & MANUFACTURING LAB

### OBJECTIVES:

- To develop the part drawings of various mechanical components and assembly operations are carried in CAD. The complete model is analyzed and tested for real time conditions.
- To study the constructional details and working of CNC machines and develop the part program for various CAD figures this helps in manufacturing of parts by turning and milling operations.

### LIST OF EXPERIMENTS:

1. Drafting: Development of part drawings for various components in the form of orthographic and isometric. Representation of Dimensioning and tolerances.
2. Part Modeling: Generation of various 3D Models through Protrusion, revolve, sweep. Creation of various features. Study of parent child relation. Feature based and Boolean based modeling and Assembly Modeling. Study of various standard Translators. Design of simple components.
3.
  - a). Determination of deflection and stresses in 2D and 3D trusses and beams.
  - b). Determination of deflections component and principal and Von-mises stresses in plane stress, plane strain and Axi-symmetric components.
  - c). Determination of stresses in 3D and shell structures
  - d). Estimation of natural frequencies and mode shapes, Harmonic response of 2D beam
  - e) Steady state heat transfer Analysis of plane and Axisymmetric components.
4.
  - a). Development of process sheets for various components based on tooling.
  - b). Development of manufacturing defects and tool management system.
  - c). Study of various post processors used in NC Machines.
  - d). Development of CNC part program for turning components and milling components.
  - e). Machining of simple components on NC lathe and Mill by transferring NC Code from a CAM package.
  - f). Quality Control and inspection.

**At least one Software Package from each category of modeling, Analysis and CAM packages from the following:**

Use of Auto CAD, CATIA, Solid works, ANSYS, NASTRAN, CNC simulation software

### FACILITY FOR ADDITIONAL EXPERIMENTS

1. 5 axis Robotic arm for studying arm movements

