

## Computer Aided Machine Drawing

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### Course Objectives:

- Introduce conventional representations of material and machine components.
- Train to use software for 2D and 3D modeling.
- Familiarize with thread profiles, riveted, welded and key joints.
- Teach solid modeling of machine parts and their sections.
- Explain creation of 2D assembly drawings from 3D assemblies.
- Familiarize with limits, fits and tolerances in mating components.

**The following contents are to be done by any 2D software package**

### Conventional representation of materials and components:

**Detachable joints:** Drawing of thread profiles, hexagonal and square-headed bolts and nuts, bolted joint, bolted joint with washer and locknut, stud joint, screw joint.

**Riveted joints:** Drawing of rivet, lap joint, butt joint with single strap, single riveted, double riveted double strap joints.

**Welded joints:** Lap joint and T joint with fillet, butt joint with conventions.

**Keys:** Taper key, sunk taper key, round key, saddle key, feather key, woodruff key.

Shaft coupling, bushed pin-type flange coupling, universal joint, Oldhams' coupling.

**The following contents to be done by any 3D software package**

**Sectional views:** Creating solid models of complex machine parts and create sectional views.

**Assembly drawings: (Any four of the following using solid model software)**

Piston, Connecting rod, Eccentric, Screw jack, Plumber block, Axle bearing, Pipe vice, Clamping device, Geneva cam, Lathe Single tool post, Clapper Box, Tail stock, Machine vice, Air Cock, Carburetor.

### Manufacturing drawing:

Representation of limits, fits and tolerances for mating parts. Use any four parts of above assembly drawings and prepare manufacturing drawing with dimensional and geometric tolerances.

### Text Books:

1. K.L.Narayana, P.Kannaiah, A text book on Machine Drawing, SciTech Publications, 2014.

**Reference Books:**

1. Cecil Jensen, Jay Helsel and Donald D.Voisinet, Computer Aided Engineering Drawing, Tata Mcgraw-Hill, NY, 2000.
2. James Barclay, Brian Griffiths, Engineering Drawing for Manufacture, Kogan Page Science, 2003.
3. N.D.Bhatt, Machine Drawing, Charotar, 50/e, 2014.
4. K.L.Narayana, Production Drawing, NewAge International Publishers, 3/e, 2014.

**Course Outcomes:**

After completion of this lab student will be able to

- Demonstrate the conventional representations of materials and machine components.
- Model riveted, welded and key joints using CAD system.
- Create solid models and sectional views of machine components.
- Generate solid models of machine parts and assemble them.
- Translate 3D assemblies into 2D drawings.
- Create manufacturing drawing with dimensional and geometric tolerances.