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# 22ME101 ENGINEERING GRAPHICS

Hours Per Week :

| L | T | P | C |
|---|---|---|---|
| 2 | 0 | 2 | 2 |

**PREREQUISITE KNOWLEDGE:** Basics of Geometry.

**COURSE DESCRIPTION AND OBJECTIVES:**

Engineering graphics is the language of engineers and is the most effective way of communicating and sharing technical ideas in the form of pictures/drawings. The objective of this course is to familiarize the students with the conventional concepts of engineering drawing and computer aided drawing.

## MODULE-1

**UNIT-1** **6L+0T+6P=12 Hours**

### ENGINEERING CURVES

Types of lines; Lettering, Dimensioning, Geometric constructions - lines, polygons (Angle, ARC, General and Inscribe in circle method), Conical curves (General method), Ellipse by Oblong method.

**UNIT-2** **10L+0T+10P=20 Hours**

### ORTHOGRAPHIC PROJECTIONS OF POINTS, LINES & PLANES

Principles of projection, Projections of points, Projection of straight lines - Inclined to one plane, inclined to both planes, Projection of planes - Inclined to one plane.

**PRACTICES:**

- Construction of polygons using different methods (i.e. ARC, Angle, General).
- Inscribe a regular hexagon & pentagon in a circle of the given diameter.
- Tracing of conical curves (Ellipse, Parabola, Hyperbola) by using General Method.
- Draw the projections of the points situated in all the 4 quadrants.
- Draw the projections of a line when it is inclined to one plane (HP or VP).
- Draw the projections of a line when it is inclined to both the planes (HP &VP).
- Draw the projections of a plane when it is inclined to one plane (HP or VP).

## MODULE-2

**UNIT-1** **6L+0T+6P=12 Hours**

**PROJECTIONS OF SOLIDS:** Projection of solids axis inclined to one reference plane - Prisms, pyramids, Cylinder and cone.

**DEVELOPMENT OF SURFACES:** Development of lateral surfaces of simple solids - Prisms, Pyramids, Cylinder and cone.

**UNIT-2** **10L+0T+10P=20 Hours**

**ORTHOGRAPHIC VIEWS:** Conversion of pictorial views into orthographic views.

**DRAFTING USING COMPUTER PACKAGE:** Introduction to 2D modelling software - AutoCAD, Conversion of Isometric view into Orthographic views of simple castings, Conversion of Orthographic views into Isometric view of simple solids - Prisms, Pyramids, Cylinders and cones

**PRACTICES:**

- Draw the projections of Prisms, when they are inclined to one reference plane (HP or VP)
- Draw the projections of Pyramids, when they are inclined to one reference plane (HP or VP)
- Draw the projections of cylinder & cone, when they are inclined to one reference plane (HP or VP)
- Draw the complete surface development of prisms&pyramids with the given dimensions
- Draw the complete surface development of cylinder & cone with the given dimensions
- Draw the orthographic view's (i. e. front view, top view, and side view) of the given pictorial view of the sketches by using AutoCAD
- Draw the Isometric view of simple solids (Prisms & Pyramids) by using AutoCAD
- Draw the Isometric view of simple solids (Cylinder & Cone) by using AutoCAD.

**SKILLS:**

- ✓ *Convert isometric views of objects into orthographic views and vice versa*
- ✓ *Visualize the shape of the 3D components*
- ✓ *Create pictorial views by using AutoCAD*
- ✓ *Understand projections by visualization.*

**COURSE OUTCOMES:**

Upon successful completion of the course, students will have the ability to:

| CO No. | Course Outcomes | Blooms Level | Module No. | Mapping with POs |
|---|---|---|---|---|
| 1 | Communicate the technical ideas in the form of drawings. | Apply | 1 | 1,2,3,5 |
| 2 | Apply the drawing skills in representing various geometrical features. | Apply | 1 | 1,2,3,5 |
| 3 | Develop orthographic projections and isometric views of various objects. | Apply | 1 | 1,2,3,5 |
| 4 | Estimate the lateral surface area of regular geometrical solids. | Analyze | 2 | 1,2,3,5 |
| 5 | Sketch simple objects and their pictorial views using AutoCAD. | Analyze | 2 | 1,2,3,5 |

**TEXT BOOKS:**

1. J Hole, "Engineering Drawing", 2nd edition, Tata McGraw-Hill, 2019.
2. N D Bhatt, "Engineering Drawing", 53rd edition, Charotar Publication, 2014

**REFERENCE BOOKS:**

1. Basant Agrawal and C.M. Agrawal "Engineering Drawing", 2nd edition, Tata Mc Graw- Hill, 2018.
2. K L Narayana, "Engineering drawing", 3rd edition, SciTech Publications, 2011.
3. Colin H. Simmons, Dennis E. Maguire, Manual of Engineering Drawing, 2nd edition, 2003.