ENGINEERING GRAPHICS

Common to ECE, CSE, IT, CSE(AI&ML) & CSE(DS) Branches

21ME104ES/21ME204ES **L T P C**
1 0 4 3

Pre-requisites: Nil

Course objectives:

1. To provide basic concepts in Engineering graphics and instruments used.
2. To impart knowledge about standard principles of the orthographic projection of objects.
3. To learn the principles of projections of points, lines, planes, and solids.
4. To teach the concept of sections of solids, sectional views, and pictorial views of solids.
5. To gain the capability of designing 3D objects with isometric principles by using computer-aidedsketches

Course outcomes: At the end of the course, the student will be able to:

CO 1: Understand the principles, significance of the engineering graphics and gets knowledge on usage ofvarious drawing instruments and be able to draw various curves like conic curves.

CO 2: Apply the concepts of scales. Draw orthographic projections of the first angle and third angleprojections

CO 3: Understand the concept of projections of points, lines, planes, and solids and acquirevisualization skills.

CO 4: Understand the sections and section views of regular solids, and development of surfaces of rightregular solids.

CO 5: Understand the Isometric parameters of regular objects and familiarize with the Auto CAD tool for drawing various objects.

UNIT– I

Introduction to Engineering Graphics: Principles of Engineering Graphics and their Significance, Dimensioning, Lettering, Conic sections–Ellipse - Eccentricity & Oblong method, parabola- Eccentricity & Tangent method, and Hyperbola - Eccentricity method.

UNIT- II

Scales–Reduced and Enlarged scales, Representative fraction - Plain, Diagonal scales.
Orthographic Projections:–Conventions–First and Third Angle projections.

Projections of Points–placed in different quadrants, Projection of straight lines parallel to one plane,perpendicular to one plane, inclined to one plane, and lines inclined to both planes.

UNIT– III

Projections of planes: Projections of Plane regular geometric figures, Planes inclined to both reference planes. Projections of Regular Solids-Prism, Cylinder.

UNIT– IV

Sections and Sectional Views: Sections and Sectional Views of Right Regular Solids – Prism, Cylinder, – Sections of Sphere. Development of Surfaces of Right Regular Solids–Prism, Cylinder.

UNIT– V

Isometric Projections: Principles of Isometric Projections – Isometric Scale – Isometric Views – Conventions, Conversion of Isometric to Orthographic Views and Vice-versa.

Introduction to AutoCAD: User Interface – Menu System-Status bar, drawing aids, drawing basic entities, modify commands, Layers, Text and Dimensioning, Blocks Applying dimensions to objects, applying annotations to drawings; Setting up and use of Layers, Create, edit and use customized layers; –coordinate systems, axis, polylines, rectangle, polygons, splines, circles, ellipse. Commands for 3D UCS, Extrude, revolve, loft, 3D move, 3D rotate, sphere, cone, cylinder, and viewports.

TEXTBOOKS:

1. N.D.Bhatt, Engineering Drawing, Charotar Publishing House Pvt Ltd, Fifty-Third Edition, 2014
2. CMAgrawal, Basant Agrawal, Engineering Graphics, McGraw Hill Education 2017
3. Dr.MH Annaiah, Dr.CN Chandrappa, and Dr.B.Sudheer Premkumar, Computer-AidedEngineering Drawing, NewAge International Publishers, Sixth edition, 2019.

REFERENCES:

1. N.S.Parthasarathy,Vela Murali, Engineering Drawing, Oxford University Press, 2015
2. K.Venugopal, Engineering Drawing and Graphics + Autocad, New Age International, 2007
3. D.M.Kulkarni, A.P.Rastogi, A.K.Sarkar, Engineering Graphics with AutoCAD, PHI Learning,2009

ONLINE REFERENCE:

1.https://nptel.ac.in/courses/112/103/112103019/

2.https://ocw.mit.edu/courses/mechanical-engineering/2-007-design-and-manufacturing-i-spring-2009/related- resources/drawing_and_sketching/