DEPARTMENT OF MECHANICAL ENGINEERING
Choice Based Credit System (CBCS)
SEMESTER – I/II

Computer Aided Engineering Drawing (2:0:1) 3
B.E(Common to all branches)
(Effective from the academic year 2024-25)

Course Code	BCED13/23	CIE Marks	50
Teaching Hours/Week (L:T:P)	2: 0: 2	SEE Marks	50
Total Number of Contact Hours	40	Exam Hours	3

Course Objectives:
This course will enable students to:
1. Illustrate skills of visualizing points and lines to represent the same in two dimensions as per international standards, by manual and computational methods.
2. Apply orthographic projections of planes and simple three-dimensional objects.
3. Construct isometric projections of solids and development of lateral surfaces

Preamble: Importance of learning Engineering Graphics, Industrial /defence application, research in the field of ME, Impact of the course on societal and sustainable solutions.

Module – 1

Introduction to Engineering graphics
Drawing Instruments and their uses, relevant BIS conventions and standards. Lettering, line conventions, dimensioning, material conventions, and free hand practicing. Co-ordinate system and reference planes HP, VP, RPP & LPP of 2D/3D environment. Selection of drawing sheet size and scale. Commands and creation of Lines, coordinate points, axes, poly-lines, square, rectangle, polygons, splines, circles, ellipse, text, move, copy, off-set, mirror, rotate, trim, extend, break, chamfer, fillet, curves, constraints viz., tangency, parallelism, inclination and perpendicularity.
Orthographic Projections: Planes of projection.

Projection of points in all the four quadrants.

Projection of Straight Lines: Projection of straight line inclined to both the planes. True length and True inclinations of a line, Apparent length and apparent inclinations of a line.
(8 Hours)

Module – 2

Projection of Plane Surfaces:
Introduction to projection of plane surfaces, Projection of Triangular, Square, Rectangular, Pentagonal, Hexagonal and Circular planes inclined to horizontal plane and vertical plane.
(8 Hours)

Module – 3

Projection of Solids:
Introduction to projections of Solids, Prisms, Pyramids, Cones, Tetrahedron and Hexahedron (cube) inclined to both the planes.
(12 Hours)

Module – 4
Isometric Projection:
Introduction, Isometric scale, Isometric projection of simple plane figures, Isometric projection of hexahedron (cube), right regular prisms, pyramids, cylinders, cones, Hemisphere and spheres. Isometric projection of combination of two solids.
(8 Hours)
Module – 5
Development of Lateral Surfaces:
Development of lateral surfaces of right regular prisms, cylinders, pyramids and cones.
(4 Hours)
Course Outcomes (COs): The students will be able to: CO1: Understand the concepts of orthographic projection for projecting points and lines. CO2: Apply the concept of orthographic projection for drawing the TWO dimensional (2D) views of planes and solids. CO3: Apply the concepts of orthographic projection for drawing the development of lateral surfaces of solids. CO4: Analyze the 2D orthographic drawings to generate isometric drawings. CO5: Apply Solid works/Solid edge/Auto cad commands for creating 2D and 3D drawings.

Textbooks:

[1] K.R. Gopalakrishna, *Engineering Graphics*, 32nd ed. Bangalore: Subhas Publications, 2013.
[2] N.D. Bhatt, *Engineering Drawing*, 48th ed. Gujarat: V. M. Panchal Charutha Publishing House, 2005.

References:

1. A Primer on Computer Aided Engineering Drawing, 2nd edition, Published by VTU, Belagavi.
2. Luzadder Warren J., Duff John M Eastern, 2009, Fundamentals of Engineering Drawing with an Introduction to Interactive Computer Graphics for Design and Production, 7th edition, Best Publications.
3. Parthasarathy N. S., Vela Murali, Engineering Drawing, Oxford University Press, 2015.