Code: 1BCEDCS103/203 **Course: Computer Aided Engineering Drawing for CSE Stream**
Credits: 3 **L:T:P 2:0:2**
SEE: 50% **CIE: 50%**
SEE Hours: 3 **Max. Marks:100**

Prerequisites if any	
Learning objectives	• Introduce engineering drawing as a universal language for engineers. • Develop the ability to read and create engineering drawings using both manual sketching and CAD tools. • Apply geometric construction and orthographic projection techniques for visualization and documentation. • Familiarize students with industry-standard CAD software. • Prepare students for visualization, design documentation, and basic modelling relevant to CSE-related applications (e.g., enclosures, layouts, flow diagrams).

Course Outcomes:

On the successful completion of the course, the student will be able to

COs	**Course Outcomes**	**Bloom's level**
CO1	Interpret and create engineering drawings using standard conventions for lines, dimensions, and projections.	Understand, Apply
CO2	Apply orthographic and isometric techniques to visualize and sketch engineering objects.	Apply, Analyse
CO3	Utilize CAD tools for creating, editing, and presenting digital engineering drawings.	Apply
CO4	Develop digital workflow skills relevant to CSE, including enclosure drawings and layouts for industry needs and demonstrate communication skills in presenting engineering concepts with clarity and precision	Apply, Analyse

Mapping with POs and PSOs:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	2	-	1	1	-	-	1	-	1	2	1
CO2	3	2	2	-	1	1	-	-	1	-	1	2	1
CO3	2	1	2	-	1	1	-	-	1	-	1	3	2
CO4	2	2	2	2	3	1	-	-	3	1	1	3	2

Mapping Strength: Strong– 3 Medium – 2 Low – 1

Course Structure

		No. of Lecture Hours	No. of Tutorial Hours	No. of Practical Hours
	Module – 1			
1.1	Introduction to Computer Aided Sketching: Drawing Instruments and their uses, BIS conventions, Dimensioning, Drawing Scales and free hand practicing. (All sketching to be done on A4 Sheets)	2		
1.2	Introduction to Computer Aided Drafting Software i.e. Solid Edge standard tool bar/menus. Co-ordinate system, selection of drawing sheet size and scale. Commands and creation of Points, Lines, axis, 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. Dimensioning conventions.	2		1
1.3	Orthographic Projections of Points and Lines: Introduction to Orthographic Projections, Projections of points in all four quadrants, Orthographic projection of lines (Placed in first quadrant only). *Application on projection of Lines (For CIE).*	5		3
	Module – 2			
2.1	Orthographic Projections of Plane Surfaces: Orthographic projection of planes viz. regular polygons like triangle, square, rectangle, pentagon, hexagon, & circular laminae.	4		3
	Module – 3			
3.1	Orthographic Projections of Solids: Orthographic Projections of right regular solids like prisms, pyramids, cylinders, cones, Cubes and tetrahedron *(Solids resting on HP only).*	5		5
3.2	Section of Solids: Introduction, Section planes, Sectional views: apparent shapes and true shapes, Sections of right regular prisms, pyramids, cylinders and cones resting with their base on HP. (Concepts only and No Problems for practice)	1		
	Module – 4			
4.1	Isometric Projection: Isometric scale, Isometric projection of plane figures, solids: tetrahedron, hexahedron (cube), right regular prisms, pyramids, cylinders, cones, spheres, Isometric projection of combination of two simple solids.	3		3
	Module – 5 (CIE Only)			
5.1	Front panel layouts of devices (monitor, CPU cabinet, network switches)	1		
5.2	PCB outline drawings with hole patterns and connectors (not electrical routing).	1		
5.3	Simple network diagram representation (routers, switches, servers – symbolic representation).	1		
	Total No. of Lecture Hours	**25**		
	Total No. of Tutorial Hours			
	Total No. of Practical Hours			**15**

Text Books:

1. Engineering Drawing by N.D. Bhatt & V.M. Panchal, 53rd edition, 2019-Charotar Publishing House, Gujarat.
2. Engineering Graphics by K.R. Gopalakrishna, 32nd edition, 2010- Subash Publishers Bangalore.

Reference Books:

1. Fundamentals of Engineering Drawing with an Introduction to Interactive Computer Graphics for Design and Production- by Luzadder Warren J., Duff John M., Eastern Economy Edition, 2005- Prentice Hall of India Pvt. Ltd. NewDelhi.

MOOC Resources:

1. https://lntedutech.com/courses/engineering-graphics-and-design/

Online Resources:

1. Mechanical Engineering Department's YouTube channel: https://youtube.com/channel/UCXOY3X4xcbTFIczaNVhESQw
2. Projections of Points: https://youtube.com/playlist?list=PLSYYrV4OuACSlPD3LHQBT5huxrb3o8HM1
3. Projections of Lines: https://youtube.com/playlist?list=PLSYYrV4OuACSmvN5qnKdvM3yzldjp5238
4. Projections of Planes: https://youtube.com/playlist?list=PLSYYrV4OuACTL9RO6NjXdrw3EktYjpfZX
5. Projections of Solids: https://youtube.com/playlist?list=PLSYYrV4OuACSAbmbyoKV33NxB9gCDPsao
6. Isometric projections: https://youtube.com/playlist?list=PLSYYrV4OuACTGMtF0X3QGT-av0V02jnTr