|| Jai Sri Gurudev ||
Sri Adichunchanagiri Shikshana Trust (R)
SJB Institute of Technology
BGS Health and Education City, Dr. Vishnuvardhana Road, Kengeri, Bengaluru-560060
Approved by AICTE, New Delhi.
Autonomous Institute affiliated to Visvesvaraya Technological University, Belagavi
Accredited by NAAC with 'A+'grade, Certified by ISO 9001 – 2015
Recognized by UGC, New Delhi with 2(f) & 12 (B)

Mechanical Engineering Department

Semester:	I/II	Course Type:	IESC		
Course Title: Computer Aided Engineering Drawing					
Course Code:	**25CDI14/24**			**Credits:**	3
Teaching Hours/Week (L:T:P:S)		2:0:2:1		**Total Hours:**	40
CIE Marks:	50	**SEE Marks:**	50	**Total Marks:**	100
SEE Type:	Theory + Laboratory			**Exam Hours:**	3 Hours

I. Course Objectives:

This course will enable students to:

- Attain the basic principles and conventions of engineering drawing
- Understand the universal role of engineering drawing as a basic communication tool across all engineering disciplines.
- Gain hands-on experience with CAD tools used across interdisciplinary applications
- Build foundational drafting skills that support design, manufacturing, construction, circuit layout, and system modeling.

II. Teaching-Learning Process (General Instructions):

- Adopt different types of teaching methods to develop the outcomes through Power point presentations and Video demonstrations.
- Adopt teaching methods by using working models
- Adopt collaborative (Group Learning) Learning in the class.
- Adopt Problem Based Learning (PBL), which foster students Analytical skills and develops thinking skills such as evaluating, generalizing, and analysing information with the use of modern tools.

III. COURSE CONTENT

Module-1: Introduction:	8 Hours

Significance of Engineering drawing, BIS Conventions of Engineering Drawing, Scales. Introduction to Computer Aided Drafting software, Co-ordinate systems

Orthographic Projections of Points, Lines:

Introduction to Orthographic projections, Orthographic projections of points in all the quadrants (only concept need to be explained. No problems on points).

Orthographic projections of lines. Introduction to projection of lines placed in First quadrant only as per BIS. No questions on mid-point and applications of lines.

Orthographic Projection of Planes: Orthographic projections of planes viz triangle, square, rectangle, pentagon, hexagon and circular lamina. (Placed in First quadrant only- Change of position method).

Pre-requisites (Self Learning): Basics of Geometry

RBT Levels: L1, L2

Module-2: Orthographic Projection of Solids:	8 Hours

Orthographic projection of right regular solids (Solids Resting on HP only); Prisms & Pyramids (Square, rectangle, pentagon, hexagon), Cylinder, Cone, Cube.

Pre-requisites (Self Learning): Basics of Geometry

RBT Levels: L1, L2, L3

Module-3: Isometric Projections:	8 Hours

Introduction to Isometric views, Isometric projections, Isometric scale. Isometric projection of right regular prisms, pyramids, cylinder, cube, cone and sphere. Isometric projection of frustum of cone & square pyramid (Isometric projection of combination of two simple solids.)

Pre-requisites (Self Learning): Basics of Geometry

RBT Levels: L1, L2, L3

Module-4: Development of Lateral Surfaces of Solids:	8 Hours

Introduction to development, applications, types of development. Development of lateral surfaces of right regular prisms, cylinder, pyramids and cones resting with the base on HP only. Development of their frustums and truncations.

Pre-requisites (Self Learning): Basics of Geometry and 3D Drawing

RBT Levels: L1, L2, L3

Module-5: Multi-Disciplinary application of Drawing (for CIE only)	8 Hours

- Drafting a 2D floor plan for a simple single-storey residential/commercial building.
- 2D drawing of switches, sockets, panels, junction boxes, electric circuits.
- 2D drawing of Simple machine parts / engineering components.
- Basics of computer graphics. Creation of simple geometrical objects using any suitable programming language.

Pre-requisites (Self Learning): Basics of Geometry

RBT Levels: L1, L2, L3

IV. COURSE OUTCOMES

CO1	Comprehend fundamental drawing concepts and conventions to communicate design information effectively
CO2	Analyse orthographic projections of planes and solids in various orientations.
CO3	Develop competency in using CAD software for producing engineering drawings.
CO4	Create isometric views of simple 3D components. Develop their lateral surfaces
CO5	Identify the interdisciplinary engineering components and systems through its graphical representation.

V. CO-PO-PSO MAPPING (mark H=3; M=2; L=1)

PO/PSO	1	2	3	4	5	6	7	8	9	10	11	S1	S2	S3	S4
CO1	3	2			2					1					
CO2	3	2			2					1					
CO3	3	2			2					1					
CO4	3	2			2					1					
CO5	3	2			2					1					

VI. Assessment Details (CIE & SEE)

General Rules: Annexure section - 1

CIE and SEE: Rubrics as per the Annexure

VII. Learning Resources

VII(a): Textbooks:

Sl. No.	Title of the Book	Name of the author	Edition and Year	Name of the publisher
1	Engineering Drawing: Plane and Solid Geometry	N.D. Bhatt.	53rd edition,	Charotar Publishing House Pvt. Limited, 2019.
2	Textbook Of Computer Aided Engineering Drawing,	K. R. Gopalakrishna, & Sudhir Gopalakrishna:	39th Edition,	Subash Stores, Bangalore, 2017

VII(b): Reference books:

1	Engineering Visualisation	S. N. Lal and T. Madhusudhan	First Edition, 2022	Cengage Learning India Pvt. Ltd
2	Fundamentals of Engineering Drawing,	Luzadder Warren J.	2005	Prentice-Hall of India Pvt. Ltd., New Delhi, Eastern Economy Edition, 2005

VII(c): Web links and Video Lectures (e-Resources):

- https://nptel.ac.in/courses/112104172
- https://nptel.ac.in/courses/112102304
- https://nptel.ac.in/courses/112105294
- https://www.coursera.org/courses?query=3d%20modeling&utm
- https://www.classcentral.com/subject/sheet-metal-design?utm

VIII: Activity Based Learning / Practical Based Learning/Experiential learning:

Activities: Model Preparation like Prisms, Pyramids, cones etc.