Name of Department: Mechanical Engineering

1. **Subject Code:** PME 153-253 **Course Title:** Engineering Graphics & Design
2. **Contact Hours:** L: 1 T: 0 P: 4
3. **Credits:** 3
4. **Semester**: I & II
5. **Course Outcomes**: Upon completion of this course, students will be able to

CO1. Prepare Engineering drawings as per BIS conventions.
CO2. Prepare Computer generated drawings using CAD software.
CO3. Use the knowledge of Orthographic projections to represent engineering information/Concepts.
CO4. Prepare isometric drawings of simple objects and also have an exposure to solid modeling.

6. **Detailed Syllabus**

MODULE	CONTENTS	Contact Hrs
I	**Introduction to Computer Aided Sketching** Introduction, Drawing Instruments and their uses, BIS conventions, lettering, Dimensioning and free hand practicing. Computer screen, layout of the software, standard tool bar, and description of most commonly used tool bars, navigational tools. Coordinate system and reference planes. Definitions of HP, VP, RPP& LPP. Creation of 2D/3D environment. Selection of drawing size and scale. Commands and creation of lines, Co-ordinate points, axes, poly-lines, square, rectangle, polygons, circles, ellipse, text, move, copy, off-set, mirror, rotate, trim, extend, break, chamfer, fillet, curves, constraints viz. tangency, parallelism, inclination and perpendicularity. Dimensioning, line convention, material conventions and lettering. Computer Aided Design(CAD) software: Modeling of parts and Assemblies.	10
II	**Orthographic projections of points, lines and planes:** Introduction, Definitions - Planes of projection, reference line and conventions employed. First angle and Third angle projection. ***Projections of points*** in all the four quadrants. ***Projection of lines*** (located in first quadrant/first angle only), True and apparent lengths, True and apparent inclinations to reference planes (No application problems) ***Projection of planes***: triangle, square, rectangle, pentagon, hexagon, and circle, planes in different positions by change of position method only (No problems on punched plates and composite plates.)	25
III	**Projections of Solids:** Projections of right regular prisms, pyramids and cones with axis inclined to both the planes. (Solids resting on HP only)	10

IV	**Development of lateral surfaces of solids:** Sections of right regular prisms, pyramids, cylinders and cones resting with base on HP. Development of lateral surfaces of above solids, their truncations.	**10**
V	**Isometric Projections:** Principles of Isometric projection - Isometric Scale, Isometric Views, Conventions, Isometric views of planes, Simple and compound Solids; Conversion of Isometric Views to Orthographic Views and Vice - Versa.	**10**
VI	**Demonstration of a Simple Team Design Project that Illustrates** Geometry and topology of engineered components: creation of engineering models and their presentation in standard 2D blueprint form and as 3D wire-frame and shaded solids; meshed topologies for engineering analysis and tool-path generation for component manufacture; geometric dimensioning and tolerancing; Use of solid-modeling software for creating associative models at the component and assembly levels.	**10**
Total		**75**

Text Books:

1. Engineering Graphics- K.R. Gopalakrishna, 32nd edition, 2005- Subash Publishers, Bangalore.
2. Computer Aided Engineering Drawing – S. Trymbaka Murthy, - International Publishing house Pvt. Ltd., New Delhi, 3rd revised edition-2006.
3. Engineering Drawing- N.D. Bhatt and V.M. Panchal, 48th edition, 2005 Charotar publishing House, Gujarat.

CAD Softwares:

1. **AUTOCAD 2016**
2. **CREO 2.0**