GUJARAT TECHNOLOGICAL UNIVERSITY
Bachelor of Engineering
Subject Code: 3110013
ENGINEERING GRAPHICS & DESIGN
1st YEAR

Type of course: Engineering Science

Prerequisite: Zeal to learn the subject

Rationale: Engineering Drawing is an effective language of engineers. It is the foundation block which strengthens the engineering & technological structure. Moreover, it is the transmitting link between ideas and realization.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE (E)	PA (M)	ESE Viva (V)	PA (I)	
2	0	4	4	70	30	30	20	150

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1	**Introduction to Engineering Graphics:** Drawing instruments and accessories, BIS – SP 46. Use of plane scales, Diagonal Scales and Representative Fraction	2 (Lab teaching)	20%
2	**Loci of Points:** Path of the points moving on Simple mechanisms, Slider crank mechanism, Four bar mechanism	2	
3	**Engineering Curves:** Classification and application of Engineering Curves, Construction of Conics, Cycloidal Curves, Involutes and Spirals along with normal and tangent to each curve	6 (Lab teaching)	
4	**Projections of Points and Lines:** Introduction to principal planes of projections, Projections of the points located in same quadrant and different quadrants, Projections of line with its inclination to one reference plane and with two reference planes. True length and inclination with the reference planes	8	30%
5	**Projections of Planes:** Projections of planes (polygons, circle and ellipse) with its inclination to one reference plane and with two reference planes, Concept of auxiliary plane method for projections of the plane	6	
6	**Projections of Solids, Section of Solids and Development of Surfaces:** Classification of solids. Projections of solids (Cylinder, Cone, Pyramid and Prism) along with frustum with its inclination to one reference plane and with two reference planes, Section of such solids and the true shape of the section, Development of surfaces	10	15%
7	**Orthographic Projections:** Fundamental of projection along with classification, Projections from the pictorial view of the object on the	2	25%

	principal planes for view from front, top and sides using first angle projection method and third angle projection method, full sectional view		
8	**Isometric Projections and Isometric View or Drawing:** Isometric Scale, Conversion of orthographic views into isometric projection, isometric view or drawing of simple objects	2 (Lab teaching)	
9	**Computer Aided Drawing:** Introduction to AutoCAD, Basic commands for 2D drawing like : Line, Circle, Polyline, Rectangle, Hatch, Fillet, Chamfer, Trim, Extend, Offset, Dim style, etc..	4 (Lab teaching)	10%

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
25	**30**	**30**	**5**	**5**	**5**

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Reference Books:

1. A Text Book of Engineering Graphics by P.J.Shah S.Chand & Company Ltd., New Delhi
2. Elementary Engineering Drawing by N.D.Bhatt Charotar Publishing House, Anand
3. A text book of Engineering Drawing by R.K.Dhawan, S.Chand & Company Ltd., New Delhi
4. A text book of Engineering Drawing by P.S.Gill, S.K.Kataria & sons, Delhi
5. Engineering Drawing by B. Agrawal and C M Agrawal, Tata McGraw Hill, New Delhi

Course Outcome:

Sr. No.	CO statement	Marks % weightage
CO-1	Know and understand the conventions and the methods of engineering drawing.	15
CO-2	Interpret engineering drawings using fundamental technical mathematics.	25
CO-3	Construct basic and intermediate geometry and comprehend the theory of projection.	25
CO-4	Improve their visualization skills so that they can apply these skills in developing new products.	25
CO-5	Improve their technical communication skill in the form of communicative drawings.	05
CO-6	Use computer software for engineering drawing.	05

List of Practical:

Students must prepare sketch book and drawing sheets on the following topics. **Minimum three problems must be given for sheet number 3 to 9.**

1. Practice sheet (which includes dimensioning methods, different types of line, construction of different polygon, divide the line and angle in parts, use of stencil)
2. Plane scale and diagonal scale
3. Loci of points (only sketch book)
4. Engineering curves
5. Projection of line
6. Projection of plane
7. Projection of solid, section of solid and development of surfaces
8. Orthographic projection
9. Isometric projection
10. At least one orthographic drawing (three views) using above mentioned AutoCAD commands.