



# GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Engineering

Level: UG

Branch: All

Course / Subject Code : BE01000061

Course / Subject Name : Engineering Graphics & Design

w. e. f. Academic Year:	2024-25
Semester:	Ist Year
Category of the Course:	Engineering Science

<b>Prerequisite:</b>	Zeal to learn the subject
<b>Rationale:</b>	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.

## Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT level
1	Apply the conventions and the methods of engineering drawing also interpret engineering drawings	Application
2	Construct basic and intermediate geometry and comprehend the theory of projection.	Application
3	Dissect the objects in three dimensions with different orientation.	Analyze
4	Make use of computer software for engineering drawings.	Application

## Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Tutorial / Practical		
				ESE (E)	PA / CA (M)	PA/CA (I)	ESE (V)	
1	0	2	2	70	30	20	30	150

## Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	<b>Introduction to Engineering Graphics:</b> Drawing instruments and accessories, BIS – SP 46. Use of plane scales, Diagonal Scales and Representative Fraction.	*	10



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2.	<b>Engineering Curves:</b> Classification and application of Engineering Curves, Construction of Conics, Cycloidal Curves, Involutives and Spirals	*	10
3.	<b>Projections of Points and Lines:</b> 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.	4	20
4.	<b>Projections of Planes:</b> Projections of planes (polygons, circle and ellipse) with its inclination to one reference plane and with two reference planes	2	20
5.	<b>Projections of Solids, Section of Solids:</b> 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.	6	20
6.	<b>Orthographic Projections:</b> Fundamental of projection along with classification, Projections from the pictorial view of the object on the principal planes for view from front, top and sides using first angle projection method and third angle projection method, full sectional view.	3	20
7.	<b>Computer Aided Drawing:</b> Introduction to AutoCAD, Basic commands for 2D drawing like : Line, Circle, Polyline, Rectangle, Hatch, Fillet, Chamfer, Trim, Extend, Offset, Dim style, etc.	*	
<b>Total</b>		15	<b>100</b>

\* Chapter/Topics must be taught during laboratory sessions.

## 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	15	-	-

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

## References/Suggested Learning Resources:

### (a) Books:

1. A Text Book of Engineering Graphics by P.J.Shah S.Chand & Company Ltd., New Delhi.



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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.

**(b) Open-source software and website:**

1. AutoCAD

**Suggested Course Practical List:**

Students must prepare sketch book and drawing sheets on the following topics.

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 Hrs.
2. Plane scale and diagonal scale – 2 Hrs.
3. Engineering curves- 4 Hrs.
4. Projection of point and line – 4 Hrs.
5. Projection of plane – 4 Hrs.
6. Projection of solid, section of solid - 4 Hrs.
7. Orthographic projection – 6 Hrs.
8. At least one orthographic drawing (three views) using above mentioned AutoCAD commands. – 4 Hrs.

**List of Laboratory/Learning Resources Required:**

**Suggested Project List:**

1. Students must prepare at least one model using cardboard/paper to understand the fundamentals of topic no. 1 to 6. This project work will be considered for practical evaluation.

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