

GUJARAT TECHNOLOGICAL UNIVERSITY

ENGINEERING GRAPHICS (Modified on 4th Feb 2014)

SUBJECT CODE: 2110013

B.E. 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 C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
			ESE (E)	PA (M)	ESE Viva (V)	PA (I)		
2	0	4	6	70	30*	30#	20	150

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment

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	-	20%
2	Engineering Curves: Classification and application of Engineering Curves, Construction of Conics, Cycloidal Curves, Involute and Spirals along with normal and tangent to each curve	6	
3	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	6	30%
4	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	
5	Projections of Solids and Section of Solids: 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	15%
6	Orthographic Projections: Fundamental of projection along with classification, Projections from the pictorial	-	35%

	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		
7	Isometric Projections and Isometric View or Drawing: Isometric Scale, Conversion of orthographic views into isometric projection, isometric view or drawing	-	

Note: Topic No. 1, 6 and 7 of the above syllabus to be covered in Practical Hours.

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:

After learning the course the students should be able to

1. To know and understand the conventions and the methods of engineering drawing.
2. Interpret engineering drawings using fundamental technical mathematics.
3. Construct basic and intermediate geometry.
4. To improve their visualization skills so that they can apply these skills in developing new products.
5. To improve their technical communication skill in the form of communicative drawings.
6. Comprehend the theory of projection.

List of Practical:

Students are required to prepare drawing sheets on the following topics. **Minimum three problems must be given for sheet number 3 to 8.**

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. Engineering curves
4. Projection of line and Projection of plane (minimum two problems on each)
5. Projection and section of solid
6. Orthographic projection
7. Isometric projection

Open Ended Problems: Apart from above experiments a group of students has to undertake one open ended problem/design problem. Few examples of the same are given below.

1. Draw the few problems of above sheets in Google sketch up.
2. Draw the few problems of above sheets in Auto CAD.
3. Prepare the orthographic / isometric views of the working model/toy/game prepared by the students in the subject of workshop practice using Google sketch up/Auto CAD.

Major Equipments: models and charts on the topics of curriculum

List of Open Source Software/learning website: <http://nptel.iitm.ac.in/courses.php>

*PA (M): 10 marks for Active Learning Assignments, 20 marks for other methods of PA

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus of Engineering Graphics is covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should be sent to achievements@gtu.edu.in.

ESE Pr (V):10 marks for Open Ended Problems, 20 marks for VIVA.

Note: Passing marks for PA (M) will be 12 out of 30.

Passing marks for ESE Pract(V) will be 15 out of 30.