

**ENGINEERING GRAPHICS**  
**BE 1<sup>st</sup> SEMESTER (ME/IT/EE/AE)**  
**BE 2<sup>nd</sup> SEMESTER (EC/CE/ CIVIL)**  
**SUB CODE: CC111**  
**Teaching Scheme (Credits and Hours)**

Teaching Scheme				Total Credit	Evaluation Scheme					Total Marks
L	T	P	Total		Theory		IE	CIA	Pract.	
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	
3	0	4	7	5	3	70	30	20	30	150

**LEARNING OBJECTIVES:**

The educational objectives of this course are

- To develop in students graphic skills for communication of concepts, ideas and design of engineering products and expose them to existing national standards related to technical drawings.
- Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.

**OUTLINE OF THE COURSE**

Sr.No	Unit No.	Minimum No. of Hrs
1	Introduction	3
2	Engineering Curves	8
3	Loci of Points	8
4	Projections of Points & Lines	9
5	Projections of Planes	9
6	Projections of Solids & Section of Solids	8
7	Development of Lateral Surfaces	9*
8	Orthographic Projections	14*
9	Isometric Projections and Isometric View or Drawing	14*
10	Computer Aided Drafting	14*
11	Machine Drawing	9*

\* Topics will be covered during Laboratory hours

**Total Hours (Theory) : 45, Total Hours (Lab) : 60, Total Hours : 105**

**DETAILED SYLLABUS**

Unit No	Topics	Lectures (Hours)	Weightage (%)
1.	<b>Introduction:</b> Introduction to Engineering Graphics, Drawing instruments and accessories, BIS - SP 46. Use of plane scales and Representative Fraction.	3	2
2.	<b>Engineering Curves:</b> Classification of Engineering Curves, Construction of Conics, Cycloidal Curves, Involute and Spirals.	8	8
3.	<b>Loci of Points:</b> Path of the points moving on simple arrangements and simple mechanisms, slider crank mechanism, four bar chain mechanism etc.	8	8
4.	<b>Projections of Points &amp; 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 of the line and its inclination with the reference planes.	9	8
5.	<b>Projections of Planes:</b> Concept of different planes, Projections of planes with its inclination to one reference plane and with two reference planes. Concept of auxiliary plane method for projections of the plane.	9	8
6.	<b>Projections of Solids &amp; Section of Solids:</b> Classification of solids. Projections of solids like Cylinder, Cone, Pyramid and Prism with its inclination to one reference plane and with two reference planes. Section of such solids and the true shape of the section.	8	8
7.	<b>Development of Lateral Surfaces:</b> Concept of development of the different surfaces.	9	8

	Parallel Line Development and Radial Line Development.		
8.	<b>Orthographic Projections:</b> Principle of projection, Principal planes of projection, Projections from the pictorial view of the object on the principal planes for View from Front, View from Top and View from Side using first angle projection method and third angle projection method, Full Sectional View.	14	14
9.	<b>Isometric Projections and Isometric View or Drawing:</b> Isometric Scale, Conversion of orthographic views into isometric projection, isometric view or drawing.	14	14
10.	<b>Computer Aided Drafting:</b> Introduction to various CAD software	14	14
11.	<b>Machine Drawing:</b> Representation of Three Dimensional objects – Need for and importance of multiple views and their placement – Developing visualization skills through free hand sketching of multiple views from pictorial views of objects.	9	8
<b>Total</b>		<b>105</b>	<b>100</b>

#### INSTRUCTIONAL METHOD AND PEDAGOGY (Continuous Internal Assessment (CIA) Scheme)

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed
- Lecture may be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lectures, Practicals and Tutorials which carries 05 Marks.
- At regular intervals assignments is given. In all, a student should submit all assignments of 05 marks each.
- Classroom participation and involvement in solving the problems in Tutorial rooms carries 05 Marks.
- Viva Voce will be conducted at the end of the semester of 05 Marks.
- One internal exam of 30 marks is conducted as a part of Mid semester evaluation.
- Experiments shall be performed in the laboratory related to course contents.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concept being taught in lectures.

#### STUDENTS LEARNING OUTCOME:

On successful completion of the course

- Be able to sketch engineering components
- Be able to interpret engineering drawings that comply with drawing standards
- Be able to produce engineering drawings
- Be able to understand the importance of computer aided drafting (CAD) system.

#### TEXT BOOKS:

- A Text Book of Engineering Graphics By P.J.Shah, S.Chand & Company Ltd., New Delhi
- A Text Book of Machine Drawing By P.J.Shah, S.Chand & Company Ltd., New Delhi
- Elementary Engineering Drawing By N.D.Bhatt, Charotar Publishing House, Anand
- Geometrical and Machine Drawing By N.D.Bhatt, Charotar Publishing House, Anand
- Gujarat Technological University B.E Sem I 10

#### REFERENCE BOOKS:

- Engineering Graphics – I and II By Arunoday Kumar, Tech – Max Publication, Pune
- Engineering Drawing & Graphics using Auto CAD 2000 By T. Jeyapooan, Vikas Publishing House Pvt. Ltd., New Delhi
- A text book of Engineering Drawing By R.K.Dhawan, S.Chand & Company Ltd., New Delhi
- A text book of Engineering Drawing By P.S.Gill, S.K.Kataria & sons, Delhi
- Engineering Drawing with an Introduction to AutoCAD By D.A.Jolhe, Tata McGraw-Hill Publishing Co. Ltd., New Delhi
- Computer Aided Engineering Drawing, S. Trymbaka Murthy, I.K.International Publishing House Pvt. Ltd., New Delhi

#### WEB MATERIALS:

- <http://www.wikipedia.org>

#### LIST OF DRAWING SHEETS

Sr. No.	Title
1	Introduction to Engineering Graphics
2	Engineering Curves
3	Loci of Points
4	Projections of Points & Lines
5	Projections of Planes
6	Projections of Solids & Section of Solids
7	Development of Lateral Surfaces
8	Orthographic Projections
9	Isometric Projections and Isometric View or Drawing
10	Auto CAD drawing on A-4 size paper