

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Pract.	Tut.	Theory	TW/Pract	Tut.	Total
FEC204	Engineering Drawing	03	04	--	03	02	--	05

Course Code	Course Name	Examination Scheme							
		Theory				Term Work	Pract	Oral	Total
		Internal Assessment			End Sem Exam				
		Test1	Test2	Av of Test 1 & 2					
FEC204	Engineering Drawing	15	15	15	60	25	50	--	150

### Objectives

1. To impart and inculcate proper understanding of the theory of projection.
2. To impart the knowledge of reading a drawing.
3. To improve the visualization skill.
4. To teach basic utility of computer aided drafting (CAD) tool.

### Outcomes: Learner will be able to...

1. Apply the basic principles of projections in 2D drawings.
2. Apply the basic principles of projections in converting 3D view to 2D drawing.
3. Read a given drawing.
4. Visualize an object from the given two views.
5. Use CAD tool to draw different views of a 3D object.
6. Use CAD tool to draw an object in 3D.

Module	Detailed Contents	Hrs.
01	<b>Introduction to Engineering Drawing:-</b> Types of Lines, Dimensioning Systems as per IS conventions. <b>Engineering Curves:-</b> Basic construction of Cycloid, Involute and Helix (of cylinder) only. <b>** Introduction to Auto CAD:-</b> Basic Drawing and Editing Commands. Knowledge of setting up layers, Dimensioning, Hatching, plotting and Printing.	3
02	<b>Projection of Points and Lines:-</b> Lines inclined to both the Reference Planes (Excluding Traces of lines) and <b>simple application based problems on Projection of lines.</b> <b>@Projection of Planes:-</b> Triangular, Square, Rectangular, Pentagonal, Hexagonal and Circular planes inclined to either HP or VP only. (Exclude composite planes)	6
03	<b>Projection of Solids:-</b> (Prism, Pyramid, Cylinder, Tetrahedron, Hexahedron and Cone only) Solid projection with the axis inclined to HP and VP. (Exclude Spheres, Composite, Hollow solids and frustum of solids). Use change of position or Auxiliary plane method <b>Section of Solids:-</b> Section of Prism, Pyramid, Cylinder, Tetrahedron, Hexahedron & Cone cut by plane perpendicular to at least one reference plane. (Exclude Curved Section Plane). Use change of position or Auxiliary plane method <b>Development of Lateral Surfaces of Sectioned Solids:-</b> Lateral surface development of Prism, Pyramid, Tetrahedron, Hexahedron, Cylinder, Cone <b>with section plane</b> inclined to HP or VP only. (Exclude DLS of a solid with a hole in it and Reverse Development). (Exclude Reverse Development)	14
04	<b>Orthographic and Sectional Orthographic Projections:-</b> <ul style="list-style-type: none"> <li>• Different views of a simple machine part as per the first angle projection method recommended by I.S.</li> <li>• Full or Half Sectional views of the Simple Machine parts.</li> <li>• <b>**Drawing of orthographic projections using Auto CAD.</b></li> </ul>	12

05	<p><b><u>Isometric Views:-</u></b> Isometric View/Drawing of blocks of plain and cylindrical surfaces using plain/natural scale only. (Exclude Spherical surfaces).</p> <ul style="list-style-type: none"> <li>• <b>**Drawing of Isometric views using Auto CAD.</b></li> <li>• <b>@Reading of Orthographic Projections. [Only for Practical Exam (AutoCAD) and Term Work]</b></li> <li>• <b>**Orthographic Reading using Auto CAD.</b></li> </ul> <p><b><u>**Introduction to 3D in AutoCAD</u></b> Working in 3-dimensions, Viewing 3D Objects, Basic wireframe models, Extruding, simple revolved objects. Boolean operations.</p>	10
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**\*\*Should be covered during Auto CAD practical sessions.**

**@ Should be covered only in Term work. (i.e. Questions will not be asked for the End semester Examination).**

### **TERM WORK:**

#### **Component – 1**

**Drawing Sheet – 1:** Projection of Solids (3 Problems)

**Drawing Sheet – 2:** Section of Solids and Development of lateral surfaces (2 Problems)

**Drawing Sheet – 3:** Orthographic Projection without section (2 Problems)

**Drawing Sheet – 4:** Orthographic Projection with section (2 Problems)

**Drawing Sheet – 5:** Isometric Views (3 Problems)

#### **Component -2**

One A-3 size sketch book consisting of:-

- 1) Two problems each from Engineering Curves, Projection of Lines, Planes and Solids. One problem from Section of solids without DLS and one problem from section of solids with DLS of that sectioned Solid.
- 2) Two problems from Orthographic Projections (with Section), One problem on Reading of Orthographic projections and Two problems on Isometric views.

#### **Component-3**

Printouts (**preferably on A3 size sheet**) of each from:

1. Orthographic Projections with Section – 3 problems.
2. Isometric Views – 4 problems
3. Reading of Orthographic Projections – 1 problem.

**Note:-** 2 hrs /week Auto CAD Practical is essential for completing the Auto CAD Drawings and take required printouts.

### **AUTO CAD PRACTICAL EXAMINATION: (2hrs – 50 marks):**

- 1) Minimum 1 problem from **1 OR 3** of **Component-3 for 30 marks.**  
(All three views with at least 12 dimensions must be asked in the exam)  
**AND**
- 2) Minimum 1 problem from **2** of **Component-3 for 20 marks.**

**Note:-** Print out of the Answers have to be taken **preferably in A3 size sheets** and should be **Assessed by External examiner only**. Knowledge of concepts and accuracy of drawing should be considered during evaluation.

**INTERNAL ASSESSMENT TEST: (1 hr - 15 marks)**

Out of the two tests, one test must be conducted by **conventional way** and another test must be **Practical Exam** (using AutoCAD software). Average of the two tests must be considered for Internal Assessment.

**END SEMESTER EXAMINATION: (3 hrs – 60 marks)**

- 1) Question paper will comprise of 6 questions, each carrying 15 marks.
- 2) Any 4 questions need to be solved. **There won't be any compulsory Question.**
- 3) Marks of each topic should be proportional to number of hours assigned to each Module.

**Text Books.**

- 1 N.D. Bhatt, "Engineering Drawing (Plane and solid geometry)", Charotar Publishing House Pvt.Ltd.
- 2 N.D. Bhatt & V.M. Panchal, "Machine Drawing", Charotar Publishing House Pvt. Ltd.

**References.**

- 1 M.B Shah & B.C Rana, "Engineering Drawing", Pearson Publications.
- 2 P.J. Shah, "Engineering Graphics", S Chand Publications.
- 3 Dhananjay A Jolhe, "Engineering Drawing" Tata McGraw Hill.
- 4 Prof. Sham Tickoo (Purdue University) &GauravVerma, "( CAD Soft Technologies) : Auto CAD 2012 (For engineers and Designers)", Dreamtech Press NewDelhi.