

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned				
		Theory	Pract.	Tut.	Theory	Tut.	Pract.	Total	
FEC204	Engineering Graphics	2	--	--	2	--	--	2	
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Pract. /oral	Total
		Internal Assessment			End Sem. Exam.	Exam. Duration (in Hrs)			
		Test1	Test 2	Avg.					
FEC204	Engineering Graphics	15	15	15	60	3	--	--	75

### 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.

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

1. Apply the basic principles of projections in Projection of Lines and Planes
2. Apply the basic principles of projections in Projection of Solids.
3. Apply the basic principles of sectional views in Section of solids.
4. Apply the basic principles of projections in converting 3D view to 2D drawing.
5. Read a given drawing.
6. Visualize an object from the given two views.

Module	Detailed Contents	Hrs.
01	<b>Introduction to Engineering Graphics</b> Principles of Engineering Graphics and their significance, usage of Drawing instruments, Types of Lines, Dimensioning Systems as per IS conventions. Introduction to plain and diagonal scales. <b>Engineering Curves</b> Basic construction of Cycloid, Involute and Helix (of cylinder) only.	2
02	<b>Projection of Points and Lines</b> Lines inclined to both the Reference Planes (Excluding Traces of lines) and simple application based problems on Projection of lines. <b>@ Projection of Planes</b> Triangular, Square, Rectangular, Pentagonal, Hexagonal and Circular planes inclined to either HP or VP only. (Exclude composite planes).	5
03	<b>Projection of Solids</b> (Prism, Pyramid, Cylinder, 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	5
04	<b>Section of Solids</b> Section of Prism, Pyramid, Cylinder, & Cone cut by plane perpendicular to at least one reference plane (Exclude Curved Section Plane). Use change of position or Auxiliary plane method.	5

05	<b>#Orthographic and Sectional Orthographic Projections:</b> - Fundamentals of orthographic projections. Different views of a simple machine part as per the first angle projection method recommended by I.S. Full or Half Sectional views of the Simple Machine parts.	3
06	<b>#@ Missing Views:</b> The identification of missing views from the given views. Create the third view from the two available views so that all the details of the object are obtained.	1
07	<b>#Isometric Views:-</b> Principles of Isometric projection – Isometric Scale, Isometric Views, Conversion of Orthographic Views to Isometric Views (Excluding Sphere ).	3
<b>@ only in Term Work ( i.e; Questions will not be asked for any examination.)</b>		
<b># more problems should be discussed during practical hours to strengthen the concepts.</b>		

### **Assessment:**

#### **Internal Assessment Test:**

Assessment consists of two class tests of 15 marks each.

Among the two tests One is Conventional (manual drawing) and Second using CAD software.

#### **End Semester Theory Examination:**

1. Question paper will comprise of total 06 questions, each carrying 15 marks.
2. Any 4 questions need to be solved. There won't be any compulsory Question
3. Total 04 questions need to be solved.
4. Remaining questions will be mixed in nature. ( e.g. Suppose Q.2 has part (a) from module 3 then part (b) will be from any module other than module 3)
5. In question paper weightage of each module will be proportional to number of respective lecture hrs as mentioned in the syllabus.

#### **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.

#### **Reference Books**

3. Narayana, K.L. & P Kanniah (2008), Text book on Engineering Drawing, Scitech Publisher.
4. Prof. Sham Tickoo (Purdue University) & Gaurav Verma, "( CAD Soft Technologies) : Auto CAD 2012 (For engineers and Designers)", Dreamtech Press New Delhi.
5. Dhananjay A Jolhe, "Engineering Drawing" Tata McGraw Hill.

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FEL203	Engineering Graphics	-	04	-	-	-	2	2	
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Pract. /oral	Total
		Internal Assessment			End Sem. Exam.	Exam. Duration (in Hrs)			
		Test1	Test 2	Avg.					
FEL203	Engineering Graphics	--	--	--	--	--	25	50	75

### Objectives

1. To inculcate the skill of drawing with the basic concepts.
2. To Use AutoCAD for daily working process.
3. 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 using a CAD software.
2. Create, Annotate, Edit and Plot drawings using basic AutoCAD commands and features.
3. Apply the concepts of layers to create drawing.
4. Apply basic AutoCAD skills to draw different views of a 3D object.
5. Apply basic AutoCAD skills to draw the isometric view from the given two views.

### Component-1 (Use half Imperial Drawing Sheet)

	Activities to be completed in the Drawing Laboratory.	Hrs
	One Practice sheet on projection of solids(minimum 2 problems )	4
	# Term Sheet 1: Projection of Solids (3 Problems).	4
	One Practice sheet on Section of Solids. (minimum 2 problems ) # Term Sheet 2: Section of solids. (3 problems).	6
	One practice sheet on Orthographic projection. (minimum 1 problem) # Term Sheet 3: Orthographic Projection (With section 1 problem, without section 1 problem).	6
	One practice sheet on Isometric drawing. (minimum 2 problems ) # Term Sheet 4: Isometric Projection. ( 3 problems).	4
# Term sheets to be done in laboratory only and to be <b>submitted as part of term work.</b> <i>Note: Practice sheets to be done before starting the Term Sheets.</i>		



## **Component-2**

### **Self-study problems/ Assignment: (In A3 size Sketch book, to be submitted as part of Term Work)**

1. Engineering Curves. (2 problems)
2. Projection of Lines (2 problems)
3. Projection of planes (2 problems)
4. Projection of solids. (2 problems)
5. Section of solids (2 problems)
6. Orthographic Projection. (With section 1 problem, without section 1 problem).
7. Missing views. (1 problem)
8. Isometric Drawing. (2 problems)

**Computer Graphics:** Engineering Graphics Software - Orthographic Projections, Isometric Projections, Co-ordinate Systems, Multi-view Projection.

	<b>To be Taught in laboratory.</b>	<b>Hrs</b>
<b>Part-A</b>	<b>Overview of Computer Graphics Covering:</b> Listing the computer technologies that impact on graphical communication, demonstrating knowledge of the theory of CAD software such as: The Menu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line (where applicable), The Status Bar, Different methods of zoom as used in CAD, Select and erase objects.	<b>3</b>
	<b>Customization &amp; CAD Drawing:</b> Consisting of set up of the drawing page and the printer including scale settings, Setting up of units and drawing limits, ISO and ANSI standards for coordinate dimensioning.	<b>3</b>
	<b>Annotations, layering &amp; other Functions Covering:</b> Applying dimensions to objects, applying annotations to drawings, Setting up and use of layers, layers to create drawings, Create, edit and use customized layers, Changing line lengths through modifying existing lines (extend/lengthen), Printing documents to paper using the print command, orthographic projection techniques, Drawing sectional views of objects (simple machine parts).	<b>4</b>
<b>Part-B</b>	<b>* Activities to be completed in the CAD Laboratory. ( All printouts to be the part of Term Work. Preferably, Use A3 size sheets for print out.)</b> <b><u>Component-3</u></b>	
	1. Orthographic Projections (without section)- 1 problem	<b>4</b>
	2. Orthographic Projection (with section)- 1 problem	<b>4</b>
	3. Orthographic Reading – 1 problem	<b>2</b>
	4. Isometric Drawing – 3 problem.	<b>4</b>

**Note:** \* Give practice sheet problems before going for Term Sheet problems.

Students are supposed to bring complete solution of problems before coming to CAD practical.

**Term Work:**

Component-1	:	7Marks
Component-2	:	6 Marks
Component-3	:	7 Marks
Attendance	:	5 Marks

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<b>Total Marks</b>	<b>:</b>	<b>25 Marks</b>
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**Note: Satisfactory submission of all 3 components is mandatory to full fill the Term.**

**Topic for the End Semester Practical Examination (Auto CAD) (2 hours/ 50 Marks.)**

1. Isometric drawing. ( 1 problem) (20 Marks)
2. Orthographic Projection (With Section) (1 problem). (30 Marks)

**Note:**

1. **Printout of the answers have to be taken preferably in A3 size sheets and should be Assessed by External Examiner only.**
2. **Knowledge of Auto CAD software, concepts of Engineering Graphics related to specified problem and accuracy of drawing should be considered during evaluation.**

**Text Books.**

1. N.D. Bhatt, "Engineering Drawing (Plane and solid geometry)", Charotar Publishing House Pvt. Ltd.
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