ENGINEERING GRAPHICS AND DESIGN LABORATORY

I Semester: CE| ECE|EEE II Semester: AE|ME|CSE|IT

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
AMEB02	Core	1	-	4	3	30	70	100
Contact Classes: 15	Tutorial Classes: Nil	Practical Classes: 60				Total Classes: 75		

COURSE OBJECTIVES:

The **course should enable the students to:**

I. Understand the basic principles of engineering drawing and construction of curves used in engineering field.
II. Apply the knowledge of interpretation of projection in different quadrants.
III. Understand the projections of solids, when it is inclined to both planes simultaneously.
IV. Convert the pictorial views into orthographic view and vice versa.
V. Create intricate details of components through sections and develop its surfaces.

COURSE LEARNING OUTCOMES (CLOs):

The students should be able to:

1. Understand the BIS conventions of engineering drawing with basic concepts, ideas and methodology.
2. Principles of dimensions and their execution. Introduction to Auto CAD.
3. Apply the commands used in AutoCAD for different basic geometries.
4. Visualize parabolic, Hyperbola and elliptical profiles in buildings and bridges.
5. Visualize cycloidal and involutes profiles in developing new products like gears and other engineering applications.
6. Discuss the various types of scales for engineering application like maps, buildings, bridges.
7. Solve specific geometrical problems in plane geometry involving points and lines.
8. Understand the theory of projection in planes located in various quadrants and apply in manufacturing processes.
9. Understand the concept of projection of solids inclined to both the planes.
10. Understand the concept of projection of section of solids inclined to both the planes.
11. Apply the terminology of development of surfaces in the area of chimneys and chutes.
12. Understand the orthographic projection concepts in solid modeling and apply the concepts in the areas of design.
13. Visualize the components by isometric projection by representing three dimensional objects in two dimensions in technical and engineering drawings.

LIST OF EXPERIMENTS

Week-1	**CONSTRUCTION OF PARABOLA BY ALL METHODS**
Draw the parabola by General Method, rectangle method, tangent method and parallelogram methods.	
Week-2	**CONSTRUCTION OF ELLIPSE BY ALL METHODS**
Draw the Ellipse by General method, concentric circle method, oblong method, arcs of circles method and parallelogram methods.	
Week-3	**CONSTRUCTION OF HYPERBOLA BY ALL METHODS**
Draw the Hyperbola by General Method and Rectangle method.	

Week-4	**CONSTRUCTION OF CYCLOIDS AND INVOLUTES**
Draw the Cycloid, Epi-Cycloid, Hypo-Cycloid, Involute for a thread wound around a circle and polygons.	
Week-5	**CONSTRUCTION OF SCALES**
Construct the Plain scale, Diagonal Scale, and Vernier scales.	
Week-6	**PROJECTION OF POINTS AND LINES**
Locate the projection of points in different quadrants. Draw the projection of the lines parallel, perpendicular and inclined to planes.	
Week-7	**PROJECTION OF PLANES**
Draw the projection of the Planes, parallel, perpendicular and inclined to planes.	
Week-8-9	**PROJECTION OF SOLIDS**
Draw the projection of the Solids whose axis is parallel, perpendicular and inclined to planes.	
Week-10	**SECTION OF SOLIDS**
Draw the projection of Solids cut by plane when the axis is parallel, perpendicular and inclined to planes.	
Week-11-12	**DEVELOPMENT OF SURFACES**
Draw the development of lateral surface of cube, cylinder, Prism, Pyramid and cone.	
WeeK-13-14	**TRANSFORMATIONS**
Conversion of Isometric Projections to Orthographic Projection and vice-versa.	
Week-15	**ISOMETRIC VIEWS**
Draw the Isometric views of solids and castings.	

Text Books:

1. N. D. Bhatt, "Engineering Drawing", Charotar Publications, 49th Edition, 2012.
2. C. M. Agrawal, Basant Agrawal, "Engineering Drawing'', Tata McGraw Hill, 2nd Edition, 2013.

Reference Books:

1. K.Venugopal, "Engineering Drawing and Graphics", New Age Publications, 2nd Edition, 2010.
2. K. C. John, "Engineering Drawing", PHI Learning Private Limited", 2nd Edition, 2009.
3. Dhananjay. A. Johle, "Engineering Drawing", Tata McGraw Hill, 1st Edition, 2008.