

## COMPUTER AIDED ENGINEERING DRAWING

**II Semester:** AE / ME / CE

Course Code	Category	Hours / Week			Credits	Maximum Marks		
AMEC03	Foundation	L	T	P	C	CIA	SEE	Total
		1	-	2	1.5	30	70	100
Contact Classes: 15	Tutorial Classes: Nil	Practical Classes: 45			Total Classes: 60			

**Prerequisite:** There are no prerequisites to take this course.

### I. COURSE OVERVIEW:

Drawing is the accurate technique that develops the ability to visualize any object with all physical and dimensional configurations. During the process of design, the designer may have to carry out a large amount of computations to generate optimum design and develops engineering drawings for manufacturing a product using interactive computer graphics. The computer aided engineering drawing assists in preparation of 3D and 2D drawings to carry out sophisticated design and analysis. This course forms the foundation for the development of computer graphics and CAD/CAM technologies in the era of digital manufacturing.

### II. COURSE OBJECTIVES:

**The students will try to learn:**

- I. The basic knowledge about engineering drawing as a communicative language of engineers in ideation.
- II. The ability to visualize, create and edit any object with all the physical and dimensional configurations using computer aided drawing tools.
- III. The code of engineering drawing practice as per the Bureau of Indian Standards and International practices.

### III. COURSE OUTCOMES:

**After successful completion of the course, students should be able to:**

- CO 1 **Illustrate** bureau of Indian standards conventions of engineering drawing with basic concepts, Understand ideas and methodology for different geometries and their execution.
- CO 2 **Apply** the commands used in AutoCAD for development of multi-aspect sketches, Apply additional and sectional view.
- CO 3 **Construct** parabolic, Hyperbolic and elliptical curves for profiles like buildings and bridges. **Build** Cycloidal and involutes profiles for developing new products like gears and other engineering applications. Apply
- CO 4 **Explain** various types of scales for engineering applications like maps, buildings, bridges. Understand
- CO 5 **Explain** the concept of projection of solids inclined to both the planes for interpretation of different views and orthographic projection concepts in solid modeling. Understand
- CO 6 **Recall** the orthographic projection concepts in solid modeling for use in conversation to isometric and Vice-versa. Apply

### IV. OBJECTIVES:

#### MODULE – I: INTRODUCTION TO ENGINEERING DRAWING AND OVERVIEW OF COMPUTER GRAPHICS

Principles of Engineering Graphics and their significance, usage of Drawing instruments, lettering.

Listing the computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CAD software.

#### MODULE – II: CONIC SECTIONS AND SCALES

Conic sections including the Rectangular Hyperbola (General method only); Cycloid, Epicycloid, Hypocycloid and Involute; Scales-Plain, Diagonal and Vernier Scales.

#### MODULE – III: PROJECTION OF POINTS AND LINES

Principles of Orthographic Projections-Conventions-Projections of Points and lines inclined to both planes.

Projections of planes, Planes inclined to both the planes.

#### MODULE – IV: PROJECTION OF REGULAR SOLIDS

Draw the orthographic views of geometrical solids of Prism, Pyramid, Cylinder and Cone.

**MODULE – V: ISOMETRIC AND ORTHOGRAPHIC PROJECTIONS**

Principles of Isometric projection–Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and compound Solids; Conversion of Isometric Views to Orthographic Views and Vice-versa.

**V. TEXT BOOKS:**

1. N. D. Bhatt, “Engineering Drawing”, Charotar Publications, New Delhi, 49<sup>th</sup> Edition, 2010.
2. C.M. Agarwal, Basant Agarwal, “Engineering Drawing”, Tata McGraw Hill, 2<sup>nd</sup> Edition, 2013.

**VI. REFERENCE BOOKS:**

1. K. Venugopal, “Engineering Drawing and Graphics”. New Age Publications, 2<sup>nd</sup> Edition, 2010.
2. Dhananjay. A. Johle, “Engineering Drawing”, Tata McGraw Hill, 1<sup>st</sup> Edition, 2008.
3. S.Trymbaka Murthy, “Computer Aided Engineering Drawing”, I.K. International Publishers, 3<sup>rd</sup> Edition, 2011.
4. A.K.Sarkar, A.P Rastogi, “Engineering graphics with Auto CAD”, PHI Learning, 1<sup>st</sup> Edition, 2010.

**VII. WEB REFERENCES:**

1. <http://nptel.ac.in/courses/112103019>
2. <http://www.autocadtutorials.net/>
3. <http://gradcab.com/questions/tutorial-16-for-beginner-engineering-drawing-I>