



# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal - 500 043, Hyderabad, Telangana

## COURSE CONTENT

MACHINE DRAWING LABORATORY								
<b>IV Semester:</b> ME								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
AMED17	Core	L	T	P	C	CIA	SEE	Total
		0	0	2	1	40	60	100
<b>Contact Classes: Nil</b>	<b>Tutorial Classes: Nil</b>	<b>Practical Classes: 45</b>			<b>Total Classes:45</b>			
<b>Prerequisite: Engineering Graphics</b>								

### I. COURSE OVERVIEW:

Machine drawing is intended to communicate the necessary technical information required for manufacture and assembly of machine components. Students practice the development of drawings of machine components as per Bureau of Indian Standards (BIS) and assembly using industry leading mechanical design software's. It is used to develop a full range of products, from single parts to assemblies containing thousands of components with accurate fit and therefore involves economic, societal, safety and manufacturing aspects.

### II. COURSES OBJECTIVES:

#### The students will try to learn

- I. The Code of drawing practice as per BIS conventions for mechanical elements using AutoCAD.
- II. The 2D drawing of joints, couplings, bearings and keys and their sectional views.
- III. The preparation of component drawings, assembly drawings and bill of materials for selected assemblies.
- IV. The part drawings of the assembly of various machines and engine components.

### III. COURSE OUTCOMES:

#### At the end of the course students should be able to:

- CO1 Interpret the various types of materials, machine elements and parts representation for machine drawings.
- CO2 Classify the different types of sectional views to reveal the internal surfaces of machine elements.
- CO3 Make use of the various machine elements to prepare the part drawings for the design process.
- CO4 Dem Draw the bearings, keys and cotter joints drawings for Assembly of machine parts.
- CO5 Categorize the couplings and riveted joints to fasten the components that require frequent assemblies.
- CO6 Develop an assembly drawings of Engine parts, Tailstock, Machine vice and safety valves to facilitate its manufacture

### IV. COURSE CONTENT:

#### WEEK 1: CONVENTIONAL REPRESENTATION

Conventional representation of materials, common machine elements and parts such as screws, nuts, bolts, keys, gears, webs and ribs. Introduction to AutoCAD.

#### WEEK 2: SECTIONAL VIEWS

Types of sections, selection of section planes and drawing of sections and auxiliary sectional views, parts not usually sectioned.

#### WEEK 3: DIMENSIONING

Methods of dimensioning, general rules for sizes, and placement of dimensions for holes, centers, and curved and tapered features

#### WEEK 4: WORKING DRAWINGS

Types of drawings–working drawings for machine parts.

**WEEK 5: MACHINE ELEMENTS**

Drawing of machine elements and simple parts; Selection of orthogonal views and additional views for the following machine elements and parts with drawing proportion, popular forms of screw threads, bolts, nuts and stud bolts.

**WEEK 6: KEYS AND COTTER JOINTS**

Keys, cotter joints, and knuckle joint

**WEEK 7: RIVETED JOINTS**

Riveted joints for plates

**WEEK 8: COUPLINGS**

Shaft couplings and spigot joint

**WEEK 9: BEARINGS**

Journal, pivot, and collar bearing

**WEEK 10: ASSEMBLY DRAWINGS-ENGINE PARTS**

Assembly drawings Assembly drawings for the following, using conventions and drawing proportions: Engine parts–stuffing box

**WEEK 11: CONNECTING ROD AND ECCENTRIC**

Eccentrics, I.C. engine connecting rod

**WEEK 12: SCREW JACK**

Screw jack

**WEEK 13: TAIL STOCK AND MACHINE VICE**

Machine vice and tailstock

**WEEK 14: SAFETY VALVES**

Rams-bottom Safety Valve, feed check valve

**V. TEXT BOOKS:**

1. K.L. Narayana, P. Kannaiah, K. Venkata Reddy, “Machine Drawing”, New Age Publishers, 3<sup>rd</sup> edition, 2021.
2. K.C. John, “Text book of Machine Drawing”, PHI Eastern Economy, 6<sup>th</sup> edition, 2020.
3. P.S Gill, “Machine Drawing”, S.K Kataria & Sons, 1<sup>st</sup> edition, 2021.

**VI. REFERENCE BOOKS:**

1. N. D. Bhatt, V. M Pancahal, “Machine Drawing”, Charotar, 53<sup>rd</sup> edition, 2019.
2. R. K. Dhavan, “A Text book of Machine drawing”, S.Chand Publication & Co, New Delhi, 2nd edition, 2008.

**VII. ELECTRONIC RESOURCES:**

1. <https://nptel.ac.in/courses/10234286>.
2. [https://akanksha.iare.ac.in/index?route=course/details&course\\_id=03](https://akanksha.iare.ac.in/index?route=course/details&course_id=03).

**VIII. MATERIALS ONLINE:**

1. Course Template
2. Lab manual