

**Course Name:** Mechanical Engineering Group **Course Code:** AE/PG/PT/ME /MH

**Semester:** Third

**Subject Title:** Mechanical Engineering Drawing **Subject Code:** 9023

**Teaching and Examination Scheme:**

Teaching Scheme			Examination Scheme						
TH	TU	PR	Paper Hrs	TH	Test	PR	OR	TW	Total
03	--	04	04	80	20	--	25#	25@	150

**Rationale:**

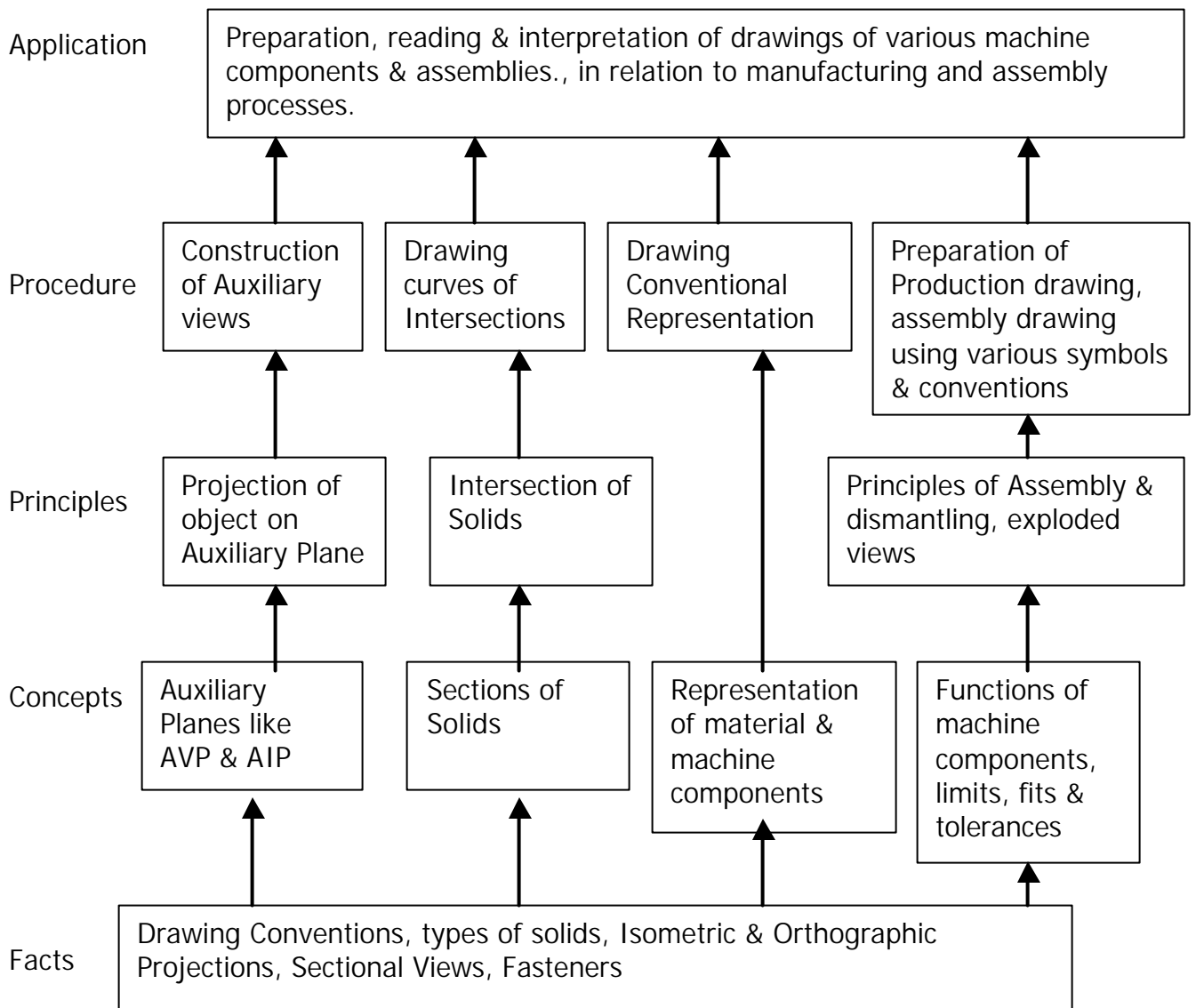
A Mechanical Engineering Diploma holder, irrespective of his field of operation in an industry, is expected to possess a thorough understanding of drawing, which includes clear spatial visualization of objects and the proficiency in reading and interpreting a wide variety of production drawings. Besides, he is also expected to possess certain degree of drafting skills depending upon his job function, to perform his day to day activity i.e. communicating and discussing ideas with his supervisors and passing instructions to his subordinates unambiguously. This course envisages reinforcing and enhancing the knowledge and skill acquired in the earlier two courses viz. Engineering Graphics & Engineering Drawing.

**Objectives:**

The Student should be able to –

1. Interpret industrial drawings.
2. Interpret instructions related to manufacturing of components.
3. Use IS convention of representing various machine components.
4. Visualize the assembly of a given set of details of machine components.
5. Know the significance & use of tolerances of size, forms & positions.

## Learning Structure:



## Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	<p><b>Auxiliary views:</b> - Study of auxiliary planes, Projection of objects on auxiliary planes. Completing the regular views with the help of given auxiliary views (Use first angle method of projection)</p>	08	12
02	<p><b>Intersection of solids:-</b>            Curves of intersection of the surfaces of the solids in the following cases            (a) Prism with prism, Cylinder with cylinder, Prism with Cylinder            When (i) the axes are at 90° and intersecting                  (ii) The axes are at 90° and Offset            (b) Cylinder with Cone            When axis of cylinder is parallel to both the reference planes and cone resting on base on HP and with axis intersecting and offset from axis of cylinder</p>	08	12
03	<p><b>Developments of Surfaces.</b></p> <p>Developments of Lateral surfaces of cube, prisms, cylinder, pyramids, cone and their applications such as tray, funnel, Chimney, pipe bends etc.</p>	08	12
04	<p><b>Conventional Representation:-</b>            1. Standard convention using SP – 46 (1988)            (a) Materials C.I., M.S, Brass, Bronze, Aluminum, wood, Glass, Concrete and Rubber            (b) Long and short break in pipe, rod and shaft.            (c) Ball and Roller bearing, pipe joints, cocks, valves, internal / external threads.            (d) Various sections- Half, removed, revolved, offset, partial and aligned sections.            (e) Knurling, serrated shafts, splined shafts, and chain wheels.            (f) Springs with square and flat ends, Gears, sprocket wheel            (g) Countersunk &amp; counterbore.            (h) Tapers</p>	04	10

05	<b>Limits, Fits and Tolerances:-</b> <ol style="list-style-type: none"> <li>1. Characteristics of surface roughness- Indication of machining symbol showing direction of lay, roughness grades, machining allowances, manufacturing methods.</li> <li>2. Introduction to ISO system of tolerancing, dimensional tolerances, elements of interchangeable system, hole &amp; shaft based system, limits, fits &amp; allowances. Selection of fit.</li> <li>3. Geometrical tolerances, tolerances of form and position and its geometric representation.</li> <li>4. General welding symbols, sectional representation and symbols used in Engineering practices</li> </ol>	04	08
06	<b>Details to Assembly</b> <ol style="list-style-type: none"> <li>1. Introduction-</li> <li>2. Couplings – Universal couplings &amp; Oldham's Coupling</li> <li>3. Bearing – Foot Step Bearing &amp; Pedestal Bearing</li> <li>4. Lathe tool Post</li> <li>5. Machine vice &amp; Pipe Vice</li> <li>6. Screw Jack</li> <li>7. Steam Stop Valve</li> </ol>	08	14
07	<b>Assembly to Details</b> <ol style="list-style-type: none"> <li>1. Introduction –</li> <li>2. Pedestal Bearing</li> <li>3. Lathe Tail Stock</li> <li>4. Drilling Jig</li> <li>5. Piston &amp; connecting rod</li> <li>6. Gland and Stuffing box Assembly</li> <li>7. Valve – Not more than eight parts</li> <li>8. Fast &amp; loose pulley</li> </ol>	08	12
		48	80

**Practical:**

Skills to be developed:

Intellectual Skills:

1. Understand interpenetration of soil

2. Interpret limits, fits and tolerances on a given drawing
3. Visualize assembly of components from given details
4. Interpret Conventional symbols as per IS code SP46
5. Identify different materials and their properties

**Motor Skills:**

1. Draw front view and top view of solids Penetrating one with other
2. Conventionally represent limit, fits and tolerances on a given drawing as per the manufacturing processes.
3. Give surface roughness values and symbols on a part drawing
4. Setting and use of different drawing equipments
5. Record bill of materials in assembly drawing
6. Use computer aided drafting package

**List Of Practical:**

(Use first angle method of projection)

1. Intersection of Solids
  - (i) One Sheet containing atleast two problems
  - (ii) Atleast four problems for home assignment in sketch book
2. Development of surfaces  
Any two problems on development of surfaces of different objects. (one Sheet)
3. Auxilliary views  
One sheet containing two problems  
At least two problems as home assignment in sketch book
4. Conventional Representation as per SP – 46 (1988) - one sheet
5. Limit, Fit, Tolerances and Machining Symbols – one sheet
6. Assembly to detailed drawings of components including conventional representation of tolerances and surface finish symbols:  
One sheet covering any one assembly and its details  
At least two problems as home assignment in sketch book
7. Details to Assembly  
Draw One sheet covering any one assembly and its details.  
Solve at least two problems as home assignment in sketchbook.
8. Two problems on assembly drawings using any CAD Package  
(Assembly containing maximum 6 to 7 components-minimum 12 hours)

## Learning Resources:

### Books:

Sr. No.	Author	Title	Publication
01	N.D.Bhatt	Machine Drawing	Charotar Publication, Anand
02	IS Code SP 46 (1988)	Code of practice for general engineering drawing.	Engineering Drawing Practice for School and colleges
03	L.K.Narayanan, P.Kannaich, K.VenkatReddy	Production Drawing	New Age International Publication
04	P.S.Gill	Machine Drawing	S.K.Kataria and Sons
05	M.L.Dabhade	Engineering Graphics (For Topic on Auxiliary Views)	
06	Sidheshwar	Machine Drawing	Tata McGraw Hill