



## GOVERNMENT POLYTECHNIC, NABARANGPUR

### DEPARTMENT OF MATHEMATICS AND SCIENCE

Discipline: <b>Mechanical , Electrical</b>	Semester: 1 <sup>st</sup>	Name of the Teaching Faculty: DEEPAK RANJAN PATTNAIK
Subject: <b>ENGINEERING DRAWING (T.h 3A)</b>	No. of days/per week class allotted: <b>4</b>	Semester From date: 28/04/2021      To Date:10/07/2021  No. of Weeks:15
<b>COURSE OUTCOMES</b>	<p><b>Objective</b> After completion of the study of Engg. Drawing the student should be able to</p> <ol style="list-style-type: none"> <li>1. Understand the importance of Engineering Drawing.</li> <li>2. Demonstrate the use of different drawing instrument.</li> <li>3. Make free hand lettering and numbering.</li> <li>4. Practice of dimensioning of drawing.</li> <li>5. Undertake different geometric constructions, projections of straight line, planes and solids.</li> <li>6. Take up different orthographic projections.</li> <li>7. Draw sectional views, development of surface of different solids.</li> <li>8. Develop the concept of building drawing.</li> <li>9. Prepare 2D engineering drawing using Auto CAD software.</li> </ol>	
<b>Week</b>	<b>Class Day</b>	<b>Theory/Practical Topics</b>
1 <sup>ST</sup>	1 <sup>ST</sup>	<b>1. INTRODUCTION &amp; DEMONSTRATION</b> 1.1 Identify various sizes of drawing boards, drawing sheets as pr BIS
	2 <sup>ND</sup>	1.2 List the types of pencils, instruments, and scales (RF).
	3 <sup>RD</sup>	1.3 Demonstrate lying of drawing sheet, margin, standard layout and title block as per BIS, folding principle of drawings (blue prints, print outs etc).
	4 <sup>TH</sup>	<b>2. TYPES OF LINES, LETTERING &amp; DIMENSIONING</b> 2.1 Demonstrate and explain the use of various types of lines.
2 <sup>ND</sup>	1 <sup>ST</sup>	2.2 Demonstrate the principle of single stroke, gothic lettering & numerals as per BIS.
	2 <sup>ND</sup>	<b>3. SCALES</b> 3.1 Significance of scales in drawing; different scales.
	3 <sup>RD</sup>	3.2 Define and draw plain sale and diagonal sale.

	4 <sup>TH</sup>	<b>4. CURVES</b> 4.1 Explain Conic sections with illustration, Explain terms like focus, vertex, directrix and eccentricity.
3 <sup>RD</sup>	1 <sup>ST</sup>	4.2 Draw conics sections by eccentricity method – Ellipse, Parabola and Hyperbola.
	2 <sup>ND</sup>	QUIZ & ASSIGNMENT - II
	3 <sup>RD</sup>	1.4.1 Analytical Method such as Law of Parallelogram of forces & method of resolution
	4 <sup>TH</sup>	1.4.2. Graphical Method. Introduction, Space diagram, Vector diagram, Polygon law of forces. (contd...)
4 <sup>TH</sup>	1 <sup>ST</sup>	4.3 Draw Ellipse by concentric circle method sand arc of circle method. (contd...)
	2 <sup>ND</sup>	4.3 Draw Ellipse by concentric circle method sand arc of cicle method.
	3 <sup>RD</sup>	4.4 Draw parabola by Rectangle Method and Tangent Method. (contd...)
	4 <sup>TH</sup>	4.4 Draw parabola by Rectangle Method and Tangent Method.
5 <sup>TH</sup>	1 <sup>ST</sup>	<b>5. OTHOGRAPHIC PROJECTIONS</b> 5.1 Demonstrate the principles of 1 st angle and 3 rd angle projections with the help of models and draw symbols. (contd...)
	2 <sup>ND</sup>	<b>5. OTHOGRAPHIC PROJECTIONS</b> 5.1 Demonstrate the principles of 1 st angle and 3 rd angle projections with the help of models and draw symbols.
	3 <sup>RD</sup>	5.2 Draw projection of points.
	4 <sup>TH</sup>	5.3 Draw projection of straight line (parallel to both planes, parallel to one and perpendicular to other, parallel to one and inclined to other and inclined to both reference planes). (contd...)
6 <sup>TH</sup>	1 <sup>ST</sup>	5.3 Draw projection of straight line (parallel to both planes, parallel to one and perpendicular to other, parallel to one and inclined to other and inclined to both reference planes).
	2 <sup>ND</sup>	5.4 Draw plane figure such as squares, rectangles, triangles, circle, Pentagon and hexagon (perpendicular to one plane and inclined to other). (contd...)
	3 <sup>RD</sup>	5.4 Draw plane figure such as squares, rectangles, triangles, circle,

		Pentagon and hexagon (perpendicular to one plane and inclined to other). engineering problems.
	4 <sup>TH</sup>	5.5 Draw projections of solids such as prism, cylinder, cone, tetrahedron and pyramid in simple position (with axis parallel to one reference plane and perpendicular to other reference plane).
7 <sup>TH</sup>	1 <sup>ST</sup>	<b>6. SECTION &amp; DEVELOPMENTS</b> 6.1 Draw the sectional projection & development of prism, cylinder, cone and pyramid in simple position by a cutting plane perpendicular to one reference plane and inclined to other reference plane.  (contd...)
	2 <sup>ND</sup>	<b>6. SECTION &amp; DEVELOPMENTS</b> 6.1 Draw the sectional projection & development of prism, cylinder, cone and pyramid in simple position by a cutting plane perpendicular to one reference plane and inclined to other reference plane.
	3 <sup>RD</sup>	6.2 Draw true shape of the cutting sections.
	4 <sup>TH</sup>	QUIZ & ASSIGNMENT - IV
8 <sup>TH</sup>	1 <sup>ST</sup>	<b>7. ISOMETRIC PROJECTIONS</b> Draw isometric view & Isometric projection of prism, pyramid, cone & cylinder with axis horizontal and vertical with construction of isometric scales. (contd...)
	2 <sup>ND</sup>	<b>7. ISOMETRIC PROJECTIONS</b> Draw isometric view & Isometric projection of prism, pyramid, cone & cylinder with axis horizontal and vertical with construction of isometric scales.
	3 <sup>RD</sup>	<b>8. BUILDING DRAWING</b> 8.1 Explain terms related to building drawing. (contd...)
	4 <sup>TH</sup>	8.1 Explain terms related to building drawing.
9 <sup>TH</sup>	1 <sup>ST</sup>	8.2 Draw plan, elevation of single room building with verandah (Flat roof according to given line plan and specification). (CONTD...)
	2 <sup>ND</sup>	DRAWING SHEETS SUBMISSION
	3 <sup>RD</sup>	8.2 Draw plan, elevation of single room building with verandah (Flat roof according to given line plan and specification).

	4 <sup>TH</sup>	8.2 Draw plan, elevation of single room building with verandah (Flat roof according to given line plan and specification). (CONTD...)
10 <sup>TH</sup>	1 <sup>ST</sup>	8.2 Draw plan, elevation of single room building with verandah (Flat roof according to given line plan and specification).
	2 <sup>ND</sup>	QUIZ & ASSIGNMENT - V
	3 <sup>RD</sup>	<b>9. PRACTICES ON AUTO CAD</b>
	4 <sup>TH</sup>	9.1 Introduction-Settings, Limits etc.  (CONTD..)
11 <sup>TH</sup>	1 <sup>ST</sup>	9.1 Introduction-Settings, Limits etc.
	2 <sup>ND</sup>	DRAWING SHEET SUBMISSION
	3 <sup>RD</sup>	DRAWING SHEET SUBMISSION
	4 <sup>TH</sup>	9.2 Auto CAD commands Draw commands (Line, circle, are polygon, ellipse, rectangle). (CONTD...)
12 <sup>TH</sup>	1 <sup>ST</sup>	9.2 Auto CAD commands Draw commands (Line, circle, are polygon, ellipse, rectangle).
	2 <sup>ND</sup>	6.1 Kinematics & Kinetics, Principles of Dynamics, Newton's Laws of Motion, Motion of Particle acted upon by a constant force,
	3 <sup>RD</sup>	Edit command, Dimension commands and Modify Commands for two dimensional drafting only.  (CONTD...)
	4 <sup>TH</sup>	Edit command, Dimension commands and Modify Commands for two dimensional drafting only.
13 <sup>TH</sup>	1 <sup>ST</sup>	9.3 Exercise for practice using Auto CAD. (CONTD...)
	2 <sup>ND</sup>	9.3 Exercise for practice using Auto CAD.
	3 <sup>RD</sup>	9.3.1 Orthographic projections of lines, planes sand solids as per chapter 5.0.
	4 <sup>TH</sup>	9.3.1 Orthographic projections of lines, planes sand solids as per chapter 5.0.
14 <sup>TH</sup>	1 <sup>ST</sup>	9.3.2 Isometric projection as per Chapter 7.0.
	2 <sup>ND</sup>	9.3.2 Isometric projection as per Chapter 7.0.
	3 <sup>RD</sup>	9.3.2 Isometric projection as per Chapter 7.0.
	4 <sup>TH</sup>	QUIZ AND ASSIGNMENT
15 <sup>TH</sup>	1 <sup>ST</sup>	6.3 Momentum & impulse, conservation of energy & linear momentum,

	2 <sup>ND</sup>	FINAL SUBMISSION OF COMPLETED DRAWING SHEETS
	3 <sup>RD</sup>	FINAL SUBMISSION OF COMPLETED DRAWING SHEETS
	4 <sup>TH</sup>	RFINAL SUBMISSION OF COMPLETED DRAWING SHEETS

**LEARNING RESOURCES:**

1. Machine Drawing by Basudeb Bhattacharya, Oxford University Press.
2. A Text Book of Engineering Drawing by Dr. R.K. Dhawan.
3. A Text Book of Engineering Graphics & Auto CAD by K Venugopal.
4. A Text book of Engineering Drawing by N.D. Bhatt.
5. Engineering Drawing by P.S. Gill.
6. A Introduction to Auto CAD – 2012 by George Omura, Willey India Publishers

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