

Engineering Drawing - Web course

COURSE OUTLINE

Engineering drawing is a basic course for all undergraduate Engineering program. Though Engineering drawing is considered as the language of engineers, most of the universities offer this course as a practical course with out any lecture component.

This course is aimed at providing basic understanding of the fundamentals of Engineering Drawing; mainly visualization, graphics theory, standards & conventions of drawing, the tools of drawing and the use of Drawings in engineering applications.

The topics covered are based on the syllabus for undergraduate studies in engineering. The course is planned to include sufficient simulations which would help the student in visualization of three dimensional objects and developing the drawing.

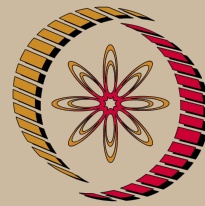
The chapters are arranged in sequence and starts from the basic concepts of geometrical constructions & engineering curves, proceeds to the principles of projection techniques. By the end of the course it is expected that the students would be matured to visualize any engineering component by reading an engineering drawing. A number of chosen problems will be solved to illustrate the concepts clearly.

Contents:

Introduction & importance of engineering drawing, Manual drawing, drawing instruments and their uses, conventions in drawing, geometrical constructions, scales, curves in engineering practice, principles of projections, projections of points, lines, planes and solids, auxiliary projections, sections of solids: intersections of solids, development of surfaces, axinometric projection and perspective projections.

COURSE DETAIL

Sl. No	Topic	Lecture No
	Module -1 (Lecture 1-15)	
1.	<ul style="list-style-type: none"> • Introduction & importance of engineering drawing. • Drawing techniques - manual drawing and computer-aided drawing. • Manual drawing instruments and their uses. 	Lecture-1
2.	<ul style="list-style-type: none"> • Conventions - ISO and BIS. • Layout of drawing sheets. • Border lines. • Title block. • Folding of drawing sheets. • Lines. 	Lecture-2



NP-TEL

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Mechanical Engineering

Additional Reading:

- Bureau of Indian Standards(BIS) : SP-46, 2003

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	<ul style="list-style-type: none"> • Lettering and dimensioning. 	
3.	Geometrical constructions <ul style="list-style-type: none"> • Bisecting a line, arc and angle • Dividing straight line in to equal number of parts. • Tangents to lines and arcs • Construction of pentagon, hexagon and octagon • Inscribing circles inside regular polygons, etc. 	Lecture-3-5
4.	Scales <ul style="list-style-type: none"> • Plane, Diagonal and vernier scales. 	Lecture-6
5.	Curves used in engineering practice: <ul style="list-style-type: none"> • Definitions of ellipse, Parabola and hyperbola. • Various methods of drawing Ellipse and drawing tangents and normals at any point on the conic. 	Lecture-7
6.	<ul style="list-style-type: none"> • Various methods of drawing parabola and hyperbola and drawing normals and tangents. 	Lecture-7&9
7.	<ul style="list-style-type: none"> • Definition of cycloids • Construction of cycloids, Epicycloids & hypocycloid. 	Lecture-10&11
8.	<ul style="list-style-type: none"> • Definition of Trochoids. • Epitrochoids. • Hypotrochoids and their construction. 	Lecture-12&13
9.	<ul style="list-style-type: none"> • Definition of Involutés, Spirals and Helices and their construction. 	Lecture-14&15
	Module - 2 (Lecture 16-27)	
10.	<ul style="list-style-type: none"> • Orthographic projection • Theories of projection. • Multi-view (orthographic) projection; VP; HP; Front view; Top view; • Projection on profile planes • Projection of objects placed in all Four quadrants. • First and third angle projections. 	Lecture-16&17

11.	Projection of points: <ul style="list-style-type: none"> • Points in 1st, 2nd, 3rd, and 4th quadrants. 	Lecture -18
12.	Projection of straight lines: <ul style="list-style-type: none"> • Line parallel to both the planes. • Line perpendicular to one plane and parallel to the other. • Line inclined to one plane and parallel to the other plane. • Lines inclined to both planes. • True lengths and inclinations. • Traces of lines. 	Lecture-19-21
13.	Projection of planes: <ul style="list-style-type: none"> • Types of planes. • Perpendicular planes. • Oblique planes. • Projections of planes parallel to one of the reference planes. • Projections of planes inclined to one reference plane and perpendicular to the other. • Projections of oblique planes. 	Lecture-22&23
14.	<ul style="list-style-type: none"> • Projections of lines and planes by Auxiliary plane method. 	Lecture -24
15.	Projection of solids <ul style="list-style-type: none"> • Types of solids. Projections of solids in simple positions: <ul style="list-style-type: none"> • Axis perpendicular to the HP. • Axis perpendicular to the VP. • Axis parallel to both the HP and the VP. • Axis inclined to HP, axis inclined to VP and axis inclined to both HP.and VP. 	Lecture-25-27
	Module - 3 (lectures 28-39)	
16.	Sections of solids <ul style="list-style-type: none"> • Introduction. • Conventions in sectional view drawings. • True shape of a section. • Sections of prisms and cylinders cones pyramids and spheres. 	Lecture-29&30

17.	Intersection of solids: <ul style="list-style-type: none"> • Classification. • Line of intersection. • Line/generator method and section plane method. • Intersection of two prisms, two cylinders, cone and cylinder, pyramid and cylinder, pyramid and prism, etc. 	Lecture-31-35
18.	Development of surfaces <ul style="list-style-type: none"> • Method of development. • Development of surfaces of oblique solids. 	Lecture-36-38
Module - 4 (lectures 39-42)		
19.	Axinometric projection: <ul style="list-style-type: none"> • Dimetric, trimetric and axinometric projection: Terminology. • Isometric scale. • Box method. • Coordinate or offset method. • Four center method. • Isometric projection of arcs. • Construction of isometric projection of different solids. 	Lecture-39&40
20.	Perspective projections: <ul style="list-style-type: none"> • Terminology and Principles of perspective projection. • Methods of perspective projection of various objects. 	Lecture-41&42

References:

1. Dhananjay A Jolhe, Engineering drawing, TMH, 2008.
2. T E French, C J Vierck and R J Foster, Graphic Science and Design, 4th edition, McGraw Hill, 1984.
3. W J Luzadder and J M Duff, Fundamentals of Engineering Drawing, 11th edition, Prentice-Hall of India, 1995.
4. K Venugopal, Engineering Drawing and Graphics, 3rd edition, New Age International, 1998.