ES 101ME

Engineering Drawing –I

Course Objectives:

- To learn the engineering graphics through AutoCAD
- To understand projection of points and lines using 2-Dimensional drawing tools
- To learn the section of solids

Unit-I
Introduction to Engineering drawing: Size of Drawing Sheet, Drawing sheet format, Types of lines, lettering, types of dimensioning, Title Block, Engineering Scales.
Free hand sketches: Sketch straight line, circles, arcs, and fillet.
Introduction to AutoCAD: Initial setup commands, utility commands, function keys, entity draw commands, display commands, edit commands, setting limits of sheet size, dimensioning and dimension style, Tile Block.

Unit – 2
Engineering curves: Conic sections, Cycloids, Involutes.
Projections: Elements of projections, multi view projections, principal plane of projections, Methods of projections, first angle and third angle projection methods.
Orthographic projections: Concept of quadrant, projection of point, projection of a line inclined to one plane and parallel to other plane, line inclined to both the planes, lines parallel to profile plane, Traces of line.

Unit – 3
Projection of Planes: Introduction, Types of planes, Traces of a planes, Projection of a planes parallel to one reference planes, projections of planes inclined to one reference planes and perpendicular to the other, projections of oblique planes.
Auxiliary projections: Types of auxiliary projection planes, Single and double auxiliary views.

Unit – 4
Projection of Solids: Introduction, Types of solids, Projection of solids in simple positions, Projections of solids axes inclined to one of the reference planes and parallel to the other, Axis inclined to the V.P. and parallel to the H.P., Axis inclined to the H.P. and parallel to the H.P. and parallel to the V.P., Transfer of point from one view to other.

Unit – 5
Sections of Solids: Introduction- Section planes, Sections, True shape of a section, Sections of Prisms, Sections of Pyramids, Sections of Cylinders, Sections of Cones and Sections of Spheres.

Suggested Reading:
2. N. D. Butt, Engineering Drawing Charotar publishing house Pvt. Ltd. 5th edition 2011
4. Sham Tickoo “ AutoCAD 2011: A Problem solving approach” Autodesk Press, USA
ENGINEERING WORKSHOP - I
(Common to all branches)

Instruction : 2 Periods per week

Duration of University Examination : 2 hours
University Examination : 50 Marks
Sessional : 25 Marks
Credits : 1

Course Objectives
1. To understand the usage and applications of hand tools.
2. To acquire the skills in pattern/model making.
3. To familiarize with various work materials and tool materials.

LIST OF EXERCISES

FITTING
1. Marking and Punching
2. Cutting and Filing
3. Matching of two parts Including Scrapping
4. Drilling and Tapping

HOUSE WIRING
1. Single Lamp Controlled by Single Switch
2. Two Lamps Series Connection
3. Two Lamps Parallel Connection
4. Stairs Case Wiring Connection

CARPENTRY
1. Half lap Joint
2. Dove Tail Joint
3. Briddle Joint
4. Briddle Dove Tail Joint

SHEET METAL WORKS
1. Making a Funnel with G.I. Sheet
2. Making a tray with G.I. Sheet
3. Making Tee Joint with Metal Tubes
4. Making a Cylindrical Jug with Riveted Handle

Suggested Reading
ES 251 ME with effect from academic year 2015-2016

ENGINEERING WORKSHOP - II

Instruction : 2 periods per week
Duration of University Examination : 2 hours
University Examination : 50 Marks
Sessional : 25 Marks
Credits : 1

Course Objectives
1. To know the usage of smithy tools and its operations.
2. To acquire the skills in welding and machining of metals.
3. To familiarize with usage of plumbing tools for making pipe joints and PC parts assembly

LIST OF EXERCISES

SMITHY
1. Flattening Operation
2. Bending Operation
3. Upsetting Operation
4. Fullering Operation

WELDING
1. Demonstration of Arc and Gas Welding
2. Bead formation on a plate
3. Lap and Butt Joints
4. Brazing and Soldering

MACHINING
1. Plain and Step Turning Operations
2. Knurling Operation
3. Taper turning Operation
4. Thread Cutting Operation

PLUMBING
1. Making Single Joint with Coupling and Union.
2. Making 90° Pipe Joint using Elbow/Bend
3. Making Tee and 4-way joint
4. Making pipe joint with two different diameters (3/4” x 1/2” Reducer)

PC ASSEMBLY
1. Demo of Assembling PC components

Suggested Reading
Course Objectives:

- To learn advanced commands in AutoCAD
- To understand development of surfaces
- To learn 3-D drawings, isometric views of solids

Unit-1
Working with Advanced Drawing options: Drawing Multilines, Editing Multilines using Grids & dialog Box, creating NURBS, editing Splines.
Grouping and Advanced Editing of Sketched Objects: Selecting groups, Editing polylines
Layers: Concept of layers, working with layers, creating, display, locking, unlocking, and delete commands,
Coordinate system in AutoCAD, UCS, WCS, MCS.

Unit-2
Development of surfaces of solids: Theory of development, methods of development, development of lateral surface along with base, reverse development.
Intersection of Surfaces: Intersection of plane versus plane, Intersection of surfaces of two solids, Inter penetration of two solids.

Unit-3
Isometric drawings: Divisions of pictorial projection, divisions of Axonometric projection, theory of Isometric Drawing, Isometric view and Isometric drawing, Isometric projections, Drawing Isometric circles, Dimensioning Isometric Objects, conversion of Isometric view to Orthographic views

Unit-4
3D modeling: Types of 3D models, 3D Coordinate Systems, basic commands in 3D, creating 3D polylines, 3DMESH command, PEDIT command.
Creating Solid Models- creating pre-defined Solid Primitives, creating complex solid models by applying Boolean operation, Dynamic UCS , methods of creating solids by - Extrude, Revolve, Swept, Loft, & Presspull, , in 3Dcreating solid models, Dynamic UCS.
Modifying 3D Objects- Fillet, Chamfer, Rotate, Mirror, Array, Slicing solid Models.
Editing 3D Objects-SOLVIEW, SOLDRAW, SOLPROF, FLATSHOT.

Unit-5
Additional AutoCAD features: Calculating the Mass Properties of Solid Models, Rendering-creating New Materials, Modifying Material, Mapping Materials on Objects, Creating Animation, CAD data exchange formats, Accessing External Database, Script Files and Slide Shows, Customizing the ACAD.PGP File.

Suggested Reading:
2. N. D. Butt, Engineering Drawing Charotar publishing house Pvt. Ltd. 5th edition 2011
4. Sham Tickoo “ AutoCAD 2011: A Problem solving approach” Autodesk Press, USA
Elements of Mechanical Engineering

Course Objectives

* To understand basic concepts of thermodynamics.
* To understand applications of thermodynamics concepts.
* To understand the working principles of I.C. engines, Reciprocating compressors and Refrigeration
* To familiarize the design and working principles of drives transmission systems.
* To understand various manufacturing processes.

UNIT- I

Statements of 0th, 1st, 2nd and 3rd Laws of thermodynamics with their applications. Representation of thermodynamics processes on P-V and T-s plots. Ideal gas equation. Relations for internal energy and entropy changes, heat and work transfers for closed systems. Steady flow energy equation for an open systems- derivation and applications in turbines, compressors, nozzles and diffusers. Relations for enthalpy changes, heat and work transfers for open systems.

UNIT-II


UNIT-III


Refrigeration: Carnot and Reversed Carnot Cycles-representation on T-s, P-V and P-h Plots. Working principle of vapour compression refrigeration system. COP calculation. Common refrigerants in use.

UNIT-IV


UNIT- V

Production Techniques: Principles of Arc, Gas and Resistance welding, soldering and Brazing, Working

Suggested Reading