

1.6 TECHNICAL DRAWING

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RATIONALE

The course is aimed at developing basic graphic skills so as to enable them to use these skills in preparation of engineering drawings, their reading and interpretation. Understand the fundamentals of Engineering Drawing. Read and interpret object drawings.

LEARNING OUTCOMES

After undergoing the subject, the students will be able to:

- Draw orthographic projections of different objects.
- Visualize three dimensional objects and draw Isometric Projections.
- Use the techniques and able to interpret the drawing in Engineering field.
- Draw exploded views of components & assemblies in preparation of service drawing.
- Draw free hand sketches of the schematic diagrams of electronic circuits, using standard symbols.
- Prepare drawing from the rough sketches provide and/or enlarge/reduce the given drawing to the desired scale.

DETAILED CONTENTS

1. Drawing Instruments and their uses

Letters and numbers (single stroke vertical), Convention of lines and their applications. Scale (reduced, enlarged & full size) plain scale and diagonal scale. Sheet layout. Geometrical constructions.

2. Active Devices

Semiconductor : Rectifier diode, Zener diode, Varacter diode, Tunnel diode, Photo, Light emitting diode (LED), Bipolar transsitor, junction field effect transistor (JFET), Mosfet, Photo transistor, Uni junction transistor (UTJ), Silicon control rectifier (SCR), Diac, Triacs outlines (with their types numbers e.g TO3, TO5, TO18, TO39, TO65 etc) of the different types of semiconductor diodes, Transistors Scrs, Diacs, Triacs and ICs (along with indicators for pin identification etc.)

3. Orthographic projections

Introduction to Orthographic projections. Conversion of pictorial view into Orthographic, Views (First Angle Projection Method Only), Dimensioning technique as per SP-46

4. Isometric projection

Isometric scale, Conversion of orthographic views into isometric View/projection(Simple objects) Projection of Straight Lines and Planes. (First Angle Projection Method only)

5. Logic gates(With the help of rough sketch/clues given)

Draw standard symbols of NOT, AND, NAND, OR, NOR XOR, Expandable & Tristate gates, Op, Amp, Ic, Flip-flops (Combination of 2,3,4 input gates should be drawn).

6. Graphical Representation of data

General concept, selection of variables & curve fitting, curve identification zero-point location. Use of various graph paper and preparation of diagram from given data. Bar charts, pie graph, pictorial graph.

7. Circuit Diagram(With the help of rough sketch/clues given)

Circuit of UPS, Block diagram of an Electronic multimeter, Circuit of Modem, Circuit diagram of Voltage stabilizers, Connection wiring diagrams, Point to point pictorial, P.C.B layout of a single electronic circuit on a graph sheet. Keeping in view the actual size of the components.

INSTRUCTIONAL STRATEGY

Teacher should show model of realia of the component/part whose drawing is to be made. Emphasis should be given on cleanliness, dimensioning and layout of sheet. Focus should be on proper selection of drawing instruments and their proper use. Students must use H grade pencils for the first few (10 sheets), till they are familiar with the proper thickness of all type of lines. Relevant IT tools to be used to state that 3D solid modelling, which is to be taught at the starting point. Also how 2D views can be obtained from 3D solid modelling to 2D views rather than the conventional method of making the students visualize the 3D view of an object by mentally constructing it from the 2D views

MEANS OF ASSESSMENT

- Drawing
- Assignments and quiz/class tests
- Mid-term and end-term written tests

RECOMMENDED BOOKS

1. A Text Book of Engineering Drawing by Surjit Singh; Dhanpat Rai & Co., Delhi
2. Engineering Drawing by PS Gill; SK Kataria & Sons, New Delhi
3. Elementary Engineering Drawing in First Angle Projection by ND Bhatt; Charotar Publishing House Pvt. Ltd., Anand
4. Engineering Drawing I & II by JS Layall; Eagle Parkashan, Jalandhar
5. Engineering Drawing I by DK Goel, GBD Publication.
6. e-books/e-tools/relevant software to be used as recommended by AICTE/UPBTE/NITTTR.

Websites for Reference:

<http://swayam.gov.in>

<http://spoken-tutorial.org>