LEVEL-II COURSES

2001 - ENGINEERING DRAWING - I

Teaching Schedule Per Week			Progressive Assessment	Examination Schedule (Marks)		
Lectures	Practical	Credits		Theory	Practical Ex.	Total
2	4	6	50	4Hrs. 100	-	150

Pre-requisite	Source
Nil	MCL

Semester	Theory	Test	Total	TW	PR	Gr Total
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RATIONALE/ Competencies to be achieved: -

1. To be able to identify drawing instruments and state the use.
2. Given a situation, student should be able to select required instruments.
3. Given a drawing, student should be able to point out errors and rectify the defects.
4. Given the drawing either pictorial or orthographic/ isometric/ auxiliary drawing- student should be able to read and interpret the same.
5. Student should be able to draw/ sketch freehand proportionate drawing of the object named.
6. Given a description, student should be able to prepare a suitable drawing.

COURSE CONTENT	Hrs	Mks
1. INTRODUCTION Importance of engineering drawing as a means of communication, difference between an artistic drawing and an engineering drawing.	1	-
2. INSTRUMENTS Drafting medium, mini drafter, pencils- grades and application, pens, compass, divider, templates, eraser, tapes (fixing) and stencils.	1	-
3. LINE WORK Visible out lines, section lines, leader lines, projection lines, short break lines, long break lines, hidden lines, centre lines and special requirement lines. Scales- Reduction scales, magnifying scales, full-scale etc. use of scales.	3	6
4. DRAWING Hexagon – given distance across the corners/ flats. To draw regular polygon in a circle, an octagon in a circle. To draw regular polygon given a side. Two methods- semi-circle method excluded. To draw an arc of given radius touching two given lines making one angle. To draw a circle of given radius touching two given circles externally. To draw an ellipse by arc of circle method, focus directrix & concentric circle method. To draw parabola by –Directrix method, Rectangle method. To draw hyperbola by- Transverse axis and focus method. Draw normal and tangent to above curves from given point on the curve. To draw cycloid- generating circle rolling on straight line. To draw involute-semi circle method excluded.	8	20
5. ORTHOGRAPHIC PROJECTIONS Third angle method of projection; first angle method of projection. Conversion of simple pictorial views into orthographic views. Dimensioning techniques: - General principles, functional dimension, auxiliary dimension, non-functional dimension, element of dimensioning, projection lines, dimension lines, leader lines, indicating dimensional values on the drawing, termination and origin indication, chain dimensioning – methods of dimensioning. Ref. ISE – Sp : 46 – 1998 for details and figures..	5	20

6. MISSING VIEWS Methods of projecting: - Side view from given front view and top view, front view from given side view and top view, top view from given front view & side view. To find the missing dimensions by referring to given views.	4	20
7. ISOMETRIC PROJECTIONS Introduction; Natural scale – Isometric scale. Isometric projection and isometric view; the difference between them. Conversions of planes into isometric view like, square, rectangular and circle. Drawing isometric views of solids like, prism, pyramid cylinder, cone, cube and frustum of these solids; Conversion of simple orthographic views into isometric views having inclined lines and curves – slots and holes.	5	18
8. AUXILIARY VIEWS Introduction - Meaning of auxiliary views, need for auxiliary views, auxiliary planes types of auxiliary views; primary auxiliary views only. Drawing auxiliary views from given two orthographic views	3	10
9. FREE-HAND SKETCHING Free hand proportionate sketches of simple machine parts mentioned below: - Hexagonal headed bolts, washer and nut, threads to be indicated conventionally i.e. By drawing two lines, Woodruff Key, Feather Key, Gib-headed key, Grub screw, Round head, Counter sunk head.	2	6
Total	32	100

REFERENCE BOOKS

1. I.S. 696 latest Edition
2. Elementary Engg. Drawing by N.D. Bhatt.
3. Geometrical and Machine Drawing by N.D. Bhatt
4. Machine Drawing by G. R Nagpal.
5. Engineering Drawing for 1st year Diploma by Viranda publication Jalgaon.
6. Engineering Drawing I by Gopal Krishna.
7. For chapters 5, 6, 7 and 8, refer (a) ' MACHINE DRAWING' by P.S.Gill (Fig. No 7.7 , 7.6, 8.1, 8.4, 8.5, 8.8, 8.10, 8.12 & 8.13.) (b) ENGG. DRAWING by F .J. Shah (Fig. 17. 36 pg. 485)
8. A Textbook of Engineering Drawing by R. K. Dhawan

GUIDELINES TO EXAMINER (Suggested Pattern of Question paper six questions)

Q.1- 20 marks: - Covering all topics specially geometrical constructions, line work, dimensioning practice & free hand sketches; simple problems on orthographic, missing views etc also may be included. Minimum 8 out of which 5 to be attempted each carrying 4 marks.

Q.2 – 16 marks: - On curves and construction. Curves or curves with tangent and normal – 10 marks, geometrical-constructions – 6 marks.

Q.3 – 16 marks: -Orthographic projections. Pictorial view of a casting or any machine part – from which student will be asked to draw front view and top view or side view front view- 10 marks; top view/side view – 6 marks.

Q.4 – 16 marks: -Missing view. Two views to be given and third view to be drawn by the student. Reproduction of given views – 6 marks; drawing of missing views and indicating dimensions – 10 marks.

Q.5 – 16 marks Isometric view: -Two orthographic views to be given and isometric view to be drawn by the student to natural scale and as per given " origin '.The figure shall include hole/ slot and also inclined surface.

Suggestions for distribution of marks: - Drawing of isometric lines – for all the vertical and horizontal lines of the given object – 6 marks. Drawing correctly the slot/hole – 4 marks

Drawing correctly the inclined surface – 4 marks.

Drawing correctly four important dimensions – 2 marks.

Q.6 – Auxillary views: -10 marks line work and free hand sketching – 6 marks.

The teacher/ examiner can select any drawing having same level of difficulty as of the figures in reference 7 above.