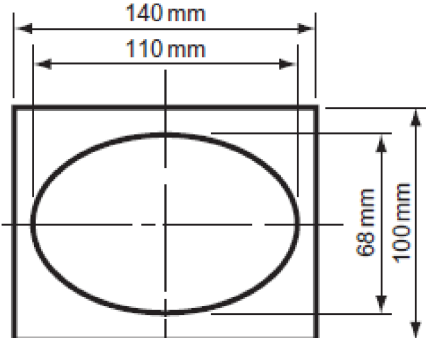


First Year 1st Semester Curriculum Structure for B.Tech. Course

Engineering Graphics & Design (ESC 102)	
Department: Program: Course Code: Title of Course:Year of Study: 1st Semester:	Basic Science and Humanities B. Tech. ESC 102 Engineering Graphics & Design First Year First
Contact Hours: Credits: Type of course:	L-T-P: 1-0-4 3 Laboratory
Pre-requisites Courses:	Basic Knowledge of Geometry
Course Outcome (CO):	• CO1:Prepare students to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability. • CO2:Prepare students to communicate effectively. • CO3:Prepare students to use the techniques, skills, and modern engineering tools necessary for engineering practice. • CO4:Helping students to increase their visualization power

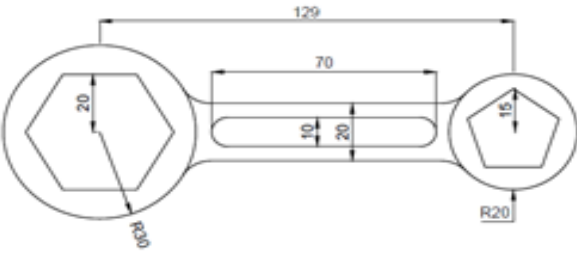
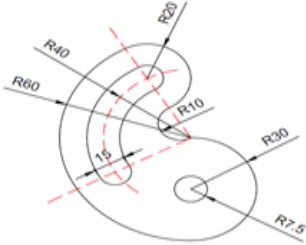
List of the Experiments

Choose any 12 experiments from the following list

Expt. No.	Experiment	Link for the experiment
1	INTRODUCTION TO ENGINEERING DRAWING: Principles of Engineering Graphics and their significance, usage of Drawing instruments, lettering, Conic sections including the Rectangular Hyperbola (General method only); Cycloid, Epicycloid, Hypocycloid and Involute; Scales – Plain, Diagonal and Vernier Scales. Assignment: Q1. a. Draw at least six types of lines are used in engineering drawing. b. Divide a straight line in 7 equal parts by (n-1) method. c. Divide a straight line in 10 equal parts by two set square method. Q2. Figure X shows the loud speaker grill of a car radio. The grill is rectangular with an elliptical hole. Draw the grill, full size, showing the construction of ellipse clearly.  Q3. A fielder throws a ball high up in the air. It reaches a horizontal distance of 40 meter to the wicket keeper and a maximum height of 64 meter from the ground. The throwing height is 1.6 meter from the ground. Name the curve and draw the trajectory of the ball.	

	Q4. Construct a conic, when the distance of any point P between the focus and the directrix is constant and equal to $\frac{3}{2}$. Name the curve. The focus is located 50 mm away from the directrix.	
2	ORTHOGRAPHIC PROJECTIONS: Principles of Orthographic Projections-Conventions -Projections of Points and lines inclined to both planes; Projections of planes inclined Planes -Auxiliary Planes. Assignment: Q5. Draw Front View and Top View of a a) Hollow cylinder (Ht=120mm, O.D. = 80 mm, ID= 50 mm) b) Right circular cone (Axis height = 80 mm, Base Dia = 50 mm) All are Standing vertically on the ground or horizontal plane	
3	PROJECTIONS OF REGULAR SOLIDS: Solids inclined to both the Planes- Auxiliary Views; Draw simple annotation, dimensioning and scale. Floor plans that include: windows, doors, and fixtures such as WC, bath, sink, shower Assignment: Q6. Right regular pentagonal pyramid, base 40 mm and axis 65 mm long has its base in the V.P. One edge of the base is inclined at 30° to the H.P. and a corner contained by the edge is on the H.P. Draw its projections. Q7. A square prism (base 40 mm, height 65 mm) has its axis inclined at 45° to the ground and parallel to V.P. The edge of the base which is nearest to the ground level is 10 mm above the ground. Draw its, F.V, T.V. & Left Hand Side View using 1st angle projection method.	
4	SECTIONS AND SECTIONAL VIEWS OF RIGHT ANGULAR SOLIDS Prism, Cylinder, Pyramid, Cone – Auxiliary Views; Development of surfaces of Right Regular Solids - Prism, Pyramid, Cylinder and Cone; Draw the sectional orthographic views of geometrical solids, objects from industry and dwellings (foundation to slab only)	

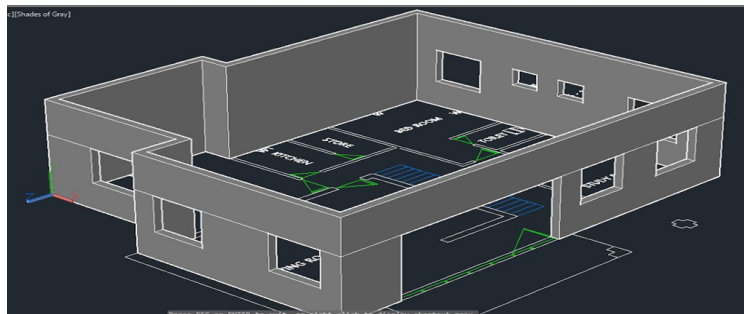
	Assignment: Q8.A right circular cone, dia of base 60 mm and axis height 100 mm is standing vertically and is cut by a plane inclined at 45 degree to HP and perpendicular to VP so as to intersect the axis of the cone at a height of 65 mm from the base. Draw the FV, Sectional TV and True Shape of the Section. Q9.Draw the development of lateral surface of a truncated cylinder standing vertically on the base(dia of base = 50 cm and Axis Height = 70 cm.)The cutting plane is perpendicular to VP, inclined at 40degree to H.P. and intersecting the axis at a distance of 35 cm from the top end.	
5	ISOMETRIC PROJECTIONS Principles of Isometric projection – Isometric Scale,Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and compound Solids;Conversion of Isometric Views to Orthographic Views and Vice-versa, Conventions; Assignment: Q10.A regular hexagonal prism (each side of base 55 cm&axis length 110 cm) is lying horizontally with its axis is parallel to V.P. Draw its Isometric Projection.	

6	OVERVIEW OF COMPUTER GRAPHICS The computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CAD software [such as: TheMenu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area(Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (ButtonBars), The Command Line (where applicable), The Status Bar, Different methods of zoom as used inCAD, Select and erase objects.; Isometric Views of lines, Planes, Simple and compound Solids Assignment: Q.11 Draw neat sketch of following figures in Sketch book and using AutoCAD software create the same. 	
7	CUSTOMISATION & CAD DRAWING Set up of the drawing page and the printer,including scale settings, Setting up of units and drawing limits; ISO and ANSI standards for coordinate dimensioning and tolerancing; Orthographic constraints, Snap to objects manually and automatically; Producing drawings by using various coordinate input entry methods to draw straight lines, Applying various ways of drawing circles. Assignment: Q.12 Draw neat sketch of following figures in Sketch book and using AutoCAD software create the same. 	
8	ANNOTATIONS, LAYERING & OTHER FUNCTIONS	

Applying dimensions to objects, applying annotations to drawings; Setting up and use of Layers, layers to create drawings, Create, edit and use customized layers; Changing line lengths through modifying existing lines (extend/lengthen); Printing documents to paper using the print command; orthographic projection techniques; Drawing sectional views of composite right regular geometric solids and project the true shape of the sectioned surface.

Assignment:

Q.13 Make AutoCAD plans of your house and 3d view of the same (Sample given)



o Book list:

1. Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House.
2. Pradeep Jain, Ankita Maheswari, A.P. Gautam, Engineering Graphics & Design, Khanna Publishing House.
3. Agrawal B. & Agrawal C. M. (2012), Engineering Graphics, TMH Publication.
4. Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education.

