COMPUTER AIDED ENGINEERING DRAWING

Subject Code :	**14CDE14/14CDE24**	**IA Marks :25**
Hours/Week :	**06**	**Exam. Hours :03**
	(Instruction 2Hrs. + Sketching & Practice 4 Hrs.)	
Total Hours :	**56**	**Exam. Marks : 100**

Course Objectives :

The main objectives of this course are to impart knowledge on:

1. Fundamentals of engineering drawing and usage of CAD software
2. Students of all branches of Engineering are trained to solve Engineering problems enabling them to understand Engineering applications.

Module – 1

Introduction to Computer Aided Sketching :

Introduction, Drawing Instruments and their uses, BIS conventions, Lettering, Dimensioning and free hand practicing. Computer screen, layout of the software, standard tool bar/menus and description of most commonly used tool bars, navigational tools. Co-ordinate system and reference planes. Definitions of HP, VP, RPP & LPP. Creation of 2D/3D environment. Selection of drawing size and scale. Commands and creation of Lines, Co-ordinate points, axes, poly-lines, square, rectangle, polygons, splines, circles, ellipse, text, move, copy, off-set, mirror, rotate, trim, extend, break, chamfer, fillet, curves, constraints viz. tangency, parallelism, inclination and perpendicularity. Dimensioning, line conventions, material conventions and lettering. **12 Hours**

Module – 2

Orthographic Projections :

Introduction, Definitions - Planes of projection, reference line and conventions employed, Projections of points in all the four quadrants, Projections of straight lines (located in First quadrant/first angle only), True and apparent lengths, True and apparent inclinations to reference planes (No application problems).

Orthographic Projections of Plane Surfaces (First Angle Projection Only) :

Introduction, Definitions–projections of plane surfaces–triangle, square, rectangle, rhombus, pentagon, hexagon and circle, planes in different

positions by change of position method only (No problems on punched plates and composite plates). **24 Hours**

Module – 3

Projections of Solids (First Angle Projection only) :
Introduction, Definitions – Projections of right regular tetrahedron, hexahedron (cube), prisms, pyramids, cylinders and cones in different positions (No problems on octahedrons and combination solid) **24 Hours**

Module – 4

Sections and Development of Lateral Surfaces of Solids :
Introduction, Section planes, Sections, Section views, Sectional views, Apparent shapes and True shapes of Sections of right regular prisms, pyramids, cylinders and cones resting with base on HP. (No problems on sections of solids)
Development of lateral surfaces of above solids, their frustums and truncations. (No problems on lateral surfaces of trays, tetrahedrons, spheres and transition pieces) **12 Hours**

Module – 5

Isometric Projection (Using Isometric Scale Only) :
Introduction, Isometric scale, Isometric projection of simple plane figures, Isometric projection of tetrahedron, hexahedron(cube), right regular prisms, pyramids, cylinders, cones, spheres, cut spheres and combination of solids (Maximum of three solids). **12 Hours**

Course Outcomes :
After studying this course,
1. Students will be able to demonstrate the usage of CAD software.
2. Students will be able to visualize and draw Orthographic projections, Sections of solids and Isometric views of solids.
3. Students are evaluated for their ability in applying various concepts to solve practical problems related to engineering drawing.

Conducting classes :
Classes may be conducted in two slots/ week of 3 hours each (Instruction 1 hr. + Sketching & Practice 2 hr.)

Scheme of Evaluation for Internal Assessment (25 Marks) :
1. 15 Marks for Class work (Sketching & Computer Aided Engineering drawing printouts in A4 size sheets).
2. 10 Marks for test in the same pattern as that of the main examination. (Better of the two Tests).

All the solutions must be valued on the spot by examining the sketches, display and the hard copies. All the sketches including the computer printouts must be submitted and they must be preserved for one year.

Scheme of Examination :
1. Module -1 is only for practice and Internal Assessment and not for examination.
2. Question paper for each batch of students will be sent online by VTU and has to be downloaded before the commencement of Examination of each batch. The answer sheets will have to be jointly evaluated by the Internal & External examiners.
3. A maximum of **THREE** questions will be set as per the following pattern *(No mixing of questions from different Modules)*.

Q. No.	From Chapters	Marks Allotted
1	Module 2	30
2	Module 3	40
3	Module 4 or Module 5	30
	Total	**100**

Scheme of Evaluation :

Q. No.	Solutions & Sketching on graph book	Computer display & printout	Total Marks
1	10 Marks	20 Marks	30
2	15 Marks	25 Marks	40
3	15 Marks	15 Marks	30
Total	**40 Marks**	**60 Marks**	**100**

Students have to submit the computer printouts and the sketches drawn on the graph sheets at the end of the examination. Both Internal & External examiners have to jointly evaluate the solutions (sketches) and computer display & printouts of each student for 100 marks (40 marks for solutions & sketches + 60 marks for computer display and printouts) and

submit the marks list along with the solution (sketches) on graph sheets & computer printouts in separate covers.

4. Each batch must consist of a minimum of 10 students and a maximum of 12 students.
5. Examination can be conducted in parallel batches, if necessary.

Text Books :

1. N.D.Bhatt & V.M.Panchal, "**Engineering Drawing**", 48th edition, 2005-Charotar Publishing House, Gujarat.

Reference Books :

1. S. Trymbaka Murthy, "**Computer Aided Engineering Drawing**", Universities Press(India) Pvt. Ltd., Hyderabad, 4th Edition.
2. K.R. Gopalakrishna, "**Engineering Graphics**", 32nd edition, Subash Publishers Bangalore, 2005.
3. Luzadder Warren J., Duff John M., "**Fundamentals of Engineering Drawing with an Introduction to Interactive Computer Graphics for Design and Production**", Eastern Economy Edition, Prentice-Hall of India Pvt. Ltd., New Delhi, 2005.
4. Prof. M. H. Annaiah, "**Computer Aided Engineering drawing**" New Age International Publisher, New Delhi. 2009.

Note :

Software Packages : Students should be taught and make familier with software packages such as, Autodesk Auto CAD 2014 (Freely downloadable). Solid Works or other similar packages

H. O. D.
Dept. Of Chemistry
Alva's Institute of Engg. & Technology
Mijar, MOODBIDRI - 574 225