

GUJARAT TECHNOLOGICAL UNIVERSITY

PRODUCTION ENGINEERING

COMPUTER AIDED DRAFTING

SUBJECT CODE: 2132503

B.E. 3RD SEMESTER

Type of course: Core

Prerequisite: Engineering Graphics

Rationale: Production engineers require the knowledge of computer aided softwares for drafting of machine elements and assemblies. These machine element and assembly drawings are essential for design and production. The present course is providing an ability to develop skill in computer aided drafting to create and analyze the production drawings.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P		Theory Marks			Practical Marks			
			ESE (E)	PA (M)		PA (V)		PA (I)		
				PA	ALA	ESE	OEP			
0	0	2	2	0	0	0	50	30	20	100

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Introduction to operating system and its compatibility with CAD software. Installation of CAD software. Introduction: Cartesian Plane with world and user coordinate systems, absolute coordinate systems, relative coordinate system with direct distance entry methods, relative polar coordinate system with direct distance entry method, object snap, Setting unit types and precision, Setting limits of a drawing, grid and snap, line type scale, use of short keys	4	15%
2	2D Commands: line, pline, multiline, construction line, ray, arc, circle, rectangle, polygon, ellipse, points, donut, single line text, multiline text, spline, hatch, boundary, Dimensioning, display, styles, system variables, system files, drawing aids, layers, inquiry, grips	8	25%
3	Modify Commands: Erase, Move, Copy, Rotate, Fillet, Chamfer, Offset, Trim, Extend, Break, Join, Array, Stretch, Align, Scale, Mirror	8	25%
4	Productive Tools: Blocks, W blocks, Insert, Minsert, oops, design centre, template file, model space, paper space, layout, print, plot, raster image, viewports	8	20%
5	Projections: Projection of points, lines and solids, Isometric drawing and Projections, Isometric axes, planes, iso-text, iso-dimension	8	15%

Reference Books:

1. AutoCAD: A Problem-Solving Approach: 2013 and beyond by Sham Tickoo, CAD/CIM Technologies, ISBN : 978-1-133-94631-1
2. Mastering AutoCAD 2014 and AutoCAD LT 2014: George Omura, Brian C. Benton ISBN: 978-1-118-57504-8
3. Engineering Drawing by N D Bhatt, Charotar Publishing House Pvt Ltd, 52nd Edition : 2013, ISBN: 978-93-80358-83-3

Course Outcome:

After learning the course the students should be able to:

1. Install CAD software compatible to the operating system.
2. Use the CAD commands of software to create and save production drawings.
3. Print/Plot 2D production drawings using standard sheet size with different orientations, scales and create an exploded view.
4. Enhance productivity in drafting using productive tools.
5. To create isometric view

List of Experiments:

1. Introduction to Computer Aided Drafting software for setting up of drawing environment compatible to operating system.
2. To create a production drawing by setting drawing limits, drawing units, layers, layer properties, grid, snap, polar settings, polar tracking, Osnap, Ltscale, textsize and saving the file.
3. Introduction to create production drawing using WCS, UCS, absolute coordinate systems, relative coordinate system with direct distance entry methods, relative polar coordinate system with direct distance entry method
4. To create basic production drawing using line, arc, circle. Erase, Move and Trim.
5. To create basic production drawing using line, pline, multiline, arc, circle, rectangle, polygon, ellipse, single line text, dimensioning, Erase, Move, Copy, Rotate, Offset, Trim, Scale, Mirror
6. Practice 2D draw and modify commands using line, pline, multiline, construction line, ray, arc, circle, rectangle, polygon, ellipse, single line text, multiline text, dimensioning, display, system variables, system files, drawing aids, layers, inquiry, grips, Erase, Move, Copy, Rotate, Fillet, Chamfer, Offset, Trim, Extend, Break, Join, Scale, Mirror.
7. Practice 2D drawing using line, pline, multiline, construction line, ray, arc, circle, rectangle, polygon, ellipse, points, donut, single line text, multiline text, spline, hatch, boundary, Dimensioning, display, styles, system variables, system files, drawing aids, layers, inquiry, grips, erase, Move, Copy, Rotate, Fillet, Chamfer, Offset, Trim, Extend, Break, Join, Array, Stretch, Align, Scale, Mirror
8. Practice all 2D commands using productive tools viz. Blocks, W blocks, Insert, Minsert, oops, design centre, template file, raster image, viewports.
9. To Draw Orthographic projection Drawings (Front, Top, side, auxiliary and detailed view) of given design.
10. Make an Isometric dimensioned drawing using isometric plane, iso-text, iso-dimension grid and snap.
11. To create a hard copy of practicals 1-10 in model space/ paper space using print/ plot command also using layouts.
12. Mini Project – I (To create real time industrial drawing 1 with hard copy on A4 size)

13. Mini-Project – II (To create real time industrial drawing 2 with assembly and obtain a hard copy on A3 size)

Open Ended Problem:

Design for the following Open Ended Problems:

Using Computer Aided Drafting software draw two stage helical gear box/fluid coupling/stainless steel pressure vessel/water proof three roller troughing impact idlers/ 5T capacity over head crane/V-type ball and cushion valve or any engineering product and assembly drawing with its part list.

Major Equipments:

Personal Computers, Computer Aided Drafting software, Digitizer, Plotter, Printer

List of Open Source Software/learning website:

- 1) courses.washington.edu/udpddp/AutoCAD20042DTutorial.pdf
- 2) www.andrew.cmu.edu/course
- 3) www.cabrillo.edu/~gmarcoccia/Chapters.pdf
- 4) http://www.cadcimtech.com/acad_2012/acad-2012.htm