GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Engineering

Level: Diploma

Branch: Civil Engineering

Course / Subject Code: DI03006061

Course / Subject Name: Computer Aided Drafting

w. e. f. Academic Year:	2024-25
Semester:	3rd
Category of the Course:	PCC

Prerequisite:	Students must be proficient in drawing of simple civil engineering structures.
Rationale:	Civil engineering drawings and visual representations are often created using computer-aided drafting before construction. Advancements in civil engineering structures have led to new features in structures. Additionally, the structural design has been updated. This highlights the significance of drawing and drafting software for visualizing structures and enhancing comprehension. In addition, user-friendly sketching software has become essential due to technological advancements. Knowledge of Computer Aided Drafting is now more crucial than ever. Civil Engineers use drawing to efficiently represent engineering information such as plans, elevations, sections, foundations, and construction elements for client and authority. Computer-aided drafting (CA Drafting) simplifies and significantly reduces the time required for drawing preparation. The use of CAD technologies such as AutoCAD and REVIT, have simplified civil engineering drawings and saved time. Knowledge of the above software is required to increase employability for diploma engineers.

Course Outcome:

After Completion of the Course, the students will be able to:

No	Course Outcomes	RBT Level
01	Prepare 2D drawings of building components like beam, slab, column and Footing of residential & commercial building using CAD.	R, U, A
02	Prepare 2D drawings like Plan, Elevation and Section of residential & Commercial building using CAD.	R, U, A
03	Prepare simple 3D drawing of residential & commercial building using CAD.	R, U, A
04	Use Revit software for preparing a civil engineering drawing	R, U, A

Revised Bloom's Taxonomy (RBT**)*

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Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
				Theory		Tutorial / Practical		
L	T	PR	C	ESE (E)	PA (M)	PA(I)	ESE (V)	
00	01	04	03	00	00	50	50	**100**

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1	**Introduction to CAD:** 1.1 CAD file menu with New, Open, Save, Save as, and Close. 1.2 Basic 2D commands like Line, Circle, Ellipse, Multi Line , Construction line, Polyline, Point, Donut, Ellipse, Polygon, Rectangle, Arc, Erase, Snap, Redraw, Regenerate, Zoom, Pan	18	30 %
2	**Demonstration of 2D commands in CAD:** 2.1 Modify Properties of Drawing Entity 2.2 Copy, Move, Rotate, Mirror, Offset, 2.3 Array, Scale, Stretch, Lengthen, Trim 2.4 Extend, Break, Chamfer, Fillet 2.5 Block, Insert, and Explode 2.6 Application of LAYER command in Civil Engineering 2.7 Layer command with all sub commands, Line type, Color 2.8 Dimension command – linear, aligned, arc, length, radius, Diameter, Centre, Leader, Baseline and Continuous, Dimensioning, tolerance, override and Dimension updates Text and DTEXT commands with Text Style, Hatch command,	24	40 %
3	**Demonstration of 3D commands in CAD:** 3.1 Units, Elevation, Thickness, UCS, and UCS Icon 3.2 Viewports, Extrude, 3D Solids – Sphere, Box, Cylinder, Cone, Wedge, Interference 3.3 3D Surface – Revolved, Tabulated and Ruled Surfaces Hide, Render and Shade of 3D Drawings. 3.4 PLOT and its Sub Command for Plotting Drawing on A1, A2 and A3 Size Paper using Printer and /or Plotter.	12	20 %

4	**Introduction to REVIT:** 4.2 Understanding of REVIT 4.3 Grid and Level 4.4 Model Line 4.5 Wall 4.6 Door & Window 4.7 Floor 4.8 Roof 4 9 Railing & Stair Case 4.10 Sheet Creation 4.11 Import & Export 4.12 Rendering in Revit 4.13 Calculate data from Revit Drawings	6	10 %
	Total	**60**	**100**

References/Suggested Learning Resources:

(a) Books:

S. No.	Title of Book	Author	Publication with place, year, and ISBN
1	AutoCAD for dummies	Bill Fane	John Wiley & Sons, 2019
2	Mastering AutoCAD 2019 and AutoCAD LT 2019	George Omura, Brian C. Benton	Sybex, 2019
3	AutoCAD Workbook for Architects and Engineers	Shannon R. Kyles	Wiley-Blackwell, 2008
4	AutoCAD 2021 Beginning and Intermediate	Munir M. Hamad	Mercury Learning and Information2020
5	Autodesk Revit 2024 Architecture Basics	Elise Moss	SDC, Publication,2023

(b) Open-source software and website:

1. Auto CAD, Civil Architect
2. www.Autodesk.com.

List of suggested exercises:

Exp. No.	**List of exercises** (To be covered during Tutorial)	Unit No.	Approx. hrs. Required
1	Draw the sectional Elevation and Plan showing Reinforcement details of Beam	1,2	02
2	Draw the sectional Elevation and Plan showing Reinforcement details of slab	1,2	02
3	Draw the sectional Elevation and Plan showing Reinforcement details of Column footing.	1,2	02
4	Drawing Furnished Plan, Elevation and Sectional View of Residential Building having Ground and 1st floor construction showing title block, legends, opening schedule; and margins with A3 page settings. Print/ Plot the above drawings using Plot Settings	1,2	03
5	Develop a 3D drawing for a 1BHK Building. Print/ Plot the above drawings using Plot Settings.	3	04
6	Prepare simple building drawings using REVIT	4	02
		Total	**15**

List of Laboratory/Learning Resources Required:

Sr. No.	Equipment Name	Exercise No.
1	Computer and relevant software	1,2,3,4,5,6

Suggested Project List: As per the list of suggested exercises

Suggested Activities for Students:

(A) Draw figures using basic commands.

(B) Complete a drawing of a residential building.

(C) Prepare drawing of a residential building using REVIT.

(D) Draw profile leveling of longitudinal section of road. (Assume required data).

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