

Devi Ahilya Vishwavidhyalaya, Indore, India Institute of Engineering & Technology				II Year B.Tech. (Civil Engineering)		
Course Code & Name	Instructions Hours per Semester and Credits					
3RVPC5 Drafting and Computational Skills	Classroom Instruction (CI)		Lab Instruction (LI)	Term Work (TW) and Self Learning (SL)	Total no. of Hours Per semester	Total Credits (Total Hours/30)
	L	T	P	TW+SL	60	2
	0	0	20	40		

Course Learning Objectives:

1. To introduce students to Computer-Aided Drafting (CAD) concepts and AutoCAD software environment.
2. To develop proficiency in 2D drafting and editing tools for civil engineering applications.
3. To enable students to create basic 3D models relevant to structural and architectural drawings.
4. To train students in dimensioning, annotation, and plotting techniques for professional documentation.
5. To apply CAD skills in preparing plans, sections, and elevations of civil structures.
6. To cultivate computational skills for efficient design communication and documentation.

Prerequisites: -Engineering Graphics and Design

COURSE CONTENTS

List of Practical Assignment:

1. **Introduction to CAD & AutoCAD Environment:** Software and hardware requirements, Input/output devices, Setting drawing limits, units, and workspace
2. **Basic Draw Commands Practice:** Line, Circle, Arc, Polygon, Ellipse, Coordinate systems (absolute, relative, polar)
3. **Modify Commands Practice:** Move, Copy, Rotate, Mirror, Scale, Trim, Extend, Offset, Fillet, Chamfer
4. **Utility & Other Commands:** Zoom, Pan, Undo/Redo, Object Snap, Grips
5. **Drawing Basic Geometric Shapes:** Practice with plotting and editing tools, Architectural views (plan, elevation), Drafting views
6. **3D Modelling in AutoCAD:** Extrude, Revolve, Sweep, Loft, 3D primitives (box, cylinder, sphere, cone), Viewing and rendering tools
7. **Dimensioning & Annotation:** Linear, angular, radial, aligned dimensioning, text styles, leaders, hatching patterns
8. **Blocks, Attributes & Drafting Symbols:** Creating and inserting blocks, using attributes for civil drawings, Drafting symbols (doors, windows, furniture)
9. **Layers, Templates & Design Center:** Layer properties and management, using templates for standardization, Exploring Design Center for reusable content
10. **Advanced Plotting Techniques:** Layouts and viewports, Plot styles and sheet setup, Printing scaled drawings
11. **Civil Engineering Application:** Drawing plan, section, and elevation of a 1-BHK house, Integrating dimensioning, hatching, and blocks

Course Outcomes:

CO. No.	CO	PO
CO1	Demonstrate understanding of CAD concepts, software setup, and hardware requirements.	PO-1, PO-5
CO2	Apply AutoCAD draw and modify commands to create 2D drawings.	PO-2, PO-3
CO3	Generate basic geometric shapes, architectural views, and drafting views	PO-3, PO-4, PO-9
CO4	Develop 3D models of civil engineering components using AutoCAD	PO-5, PO-11
CO5	Use dimensioning, annotation, hatching, blocks, layers, and templates for professional drawings and prepare plan, section, and elevation drawings of a house/building with accuracy and clarity.	PO-3, PO-6, PO-7, PO-9, PO-10

BOOKS RECOMMENDED:

1. Sham Tickoo, AutoCAD for Engineers and Designers, Pearson/ Cengage.
2. George Omura, Mastering AutoCAD, Wiley.
3. CAD Learning Resources, AutoCAD Fundamentals, Autodesk Official Training Guide.
4. Prof. M. Chandra, Computer Aided Design and Drafting, Tata McGraw Hill.
5. Civil Engineering Drawing references: B.P. Verma, Engineering Drawing and Graphics.

CO-PO-PSO Relationship

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
3RVPC5.CO1	3				3							3		
3RVPC5.CO2		3	3									3		
3RVPC5.CO3			3	2					2				2	
3RVPC5.CO4					2						2	2		
3RVPC5.CO5			3			3	3		2	2			2	2