

Certificate Course in 2D & 3D AutoCAD

Course Overview

The Certificate Course in 2D & 3D AutoCAD is designed to equip students with industry-standard drafting and modeling skills. Starting with 2D drafting and design fundamentals, learners progress to advanced 3D modeling, visualization, and rendering techniques. By the end of the course, students will be able to create accurate technical drawings, 3D models, and presentation-ready projects suitable for mechanical, civil, electrical, and architectural fields.

Course Objectives

- To familiarize students with AutoCAD interface, tools, and workflow.
 - To develop strong drafting and design skills in **2D drawings**.
 - To introduce **3D modeling, surface, and solid modeling techniques**.
 - To train students in **visualization, rendering, and presentation of 3D models**.
 - To enable learners to produce professional-grade **technical drawings** for industry applications.
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Course Outcomes

Upon successful completion, learners will be able to:

1. Create and edit precise **2D drawings and layouts**.
 2. Work with layers, dimensioning, text, hatching, and annotation tools.
 3. Build and modify **3D solid, surface, and wireframe models**.
 4. Apply **materials, lighting, and rendering** for realistic visualization.
 5. Generate **2D drawings from 3D models** for documentation.
 6. Prepare professional plots, presentations, and project outputs.
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Course Syllabus

Module 1: Introduction & 2D Drafting (Weeks 1–4)

- Introduction to CAD & AutoCAD environment
 - Navigating the workspace, UCS, and coordinate systems
 - Drawing tools: Line, Circle, Arc, Rectangle, Polygon, etc.
 - Editing tools: Move, Copy, Rotate, Mirror, Offset, Trim, Extend
 - Object properties & layers management
 - Precision drafting with OSNAP, ORTHO, Polar Tracking
 - Hatch, Gradient, Blocks, and WBLOCK
 - Text (DTEXT, MTEXT), Dimensioning, and Annotation
 - Layouts, Printing, and Plotting
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Module 2: 3D Modeling (Weeks 5–8)

- 3D workspace, UCS, and Viewports
 - Basic 3D solids: Box, Sphere, Cylinder, Cone, Wedge, Torus
 - Extrude, Revolve, Sweep, Loft commands
 - Boolean operations: Union, Subtract, Intersect
 - Solid editing tools: Fillet, Chamfer, Shell, Slice, Presspull
 - Wireframe and Surface modeling basics
 - Creating isometric and perspective views
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Module 3: Visualization & Project Work (Weeks 9–12)

- Applying Materials & Textures
- Lighting types (Point, Spot, Distant, Sunlight)
- Rendering settings & techniques
- Generating 2D drawings from 3D models (flatshot, viewbase)
- Creating orthographic & sectional views
- Final project work (Mechanical/Civil/Architectural Model)

- Project presentation & course wrap-up

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- ☒ **Duration:** 3 Months (Approx. 60 sessions, 5 sessions per week)
 - ☒ **Final Deliverable:** A professional project in **2D & 3D AutoCAD** with drawings, 3D models, and rendered views.