🎓 Certificate Course in 3D AutoCAD

Duration: 2 Months (40 Sessions, 5 sessions per week)

📘 Course Overview

This course is designed to provide students with comprehensive knowledge and hands-on skills in **3D modeling using AutoCAD**. It covers the fundamental and advanced concepts of 3D CAD such as wireframe modeling, solid and surface modeling, materials, lighting, rendering, and creating 2D drawings from 3D models. By the end of the course, learners will be capable of producing industry-standard 3D models for mechanical, civil, and architectural applications.

🎯 Course Objectives

1. To introduce students to 3D concepts and navigation in AutoCAD.
2. To teach 3D coordinate systems (UCS, WCS) for accurate modeling.
3. To develop skills in **3D Wireframe, Surface, and Solid Modeling**.
4. To enable learners to apply materials, lighting, and rendering techniques.
5. To train students in generating **2D drawings from 3D models** for industrial use.
6. To prepare students for real-world applications in mechanical, architectural, and civil design projects.

🏆 Course Outcomes

After successful completion of this course, learners will be able to:

- Create, modify, and manage **3D models** in AutoCAD.
- Apply **solid, surface, and mesh modeling techniques**.
- Use **materials, lighting, and rendering tools** to create realistic designs.
- Generate **orthographic projections and sectional views** from 3D models.
- Work on **mechanical parts, architectural layouts, and civil structures** using 3D AutoCAD.
- Develop and present a final 3D project with professional documentation.

📚 Course Syllabus

Module 1: Introduction to 3D AutoCAD

- 2D vs 3D concepts in AutoCAD
- Navigating the 3D environment
- Understanding User Coordinate System (UCS) & World Coordinate System (WCS)
- 3D View Controls & Visual Styles

Module 2: 3D Wireframe Modeling

- Wireframe modeling concepts
- Creating 3D objects: Line, Polyline, 3D Polyline, Circle, Arc
- Editing wireframe models (Rotate3D, Align, Move, Copy)

Module 3: 3D Solid Modeling

- Creating basic 3D solids (Box, Cylinder, Cone, Sphere, Wedge, Torus)
- Extrude, Revolve, Sweep, Loft commands
- Boolean operations: Union, Subtract, Intersect
- Modifying solids (Fillet, Chamfer, Shell, Slice, Presspull)

Module 4: 3D Surface Modeling

- Surface modeling concepts
- Creating Planar & Extruded surfaces
- Revolved and Lofted surfaces
- Surface Editing Tools

Module 5: 3D Visualization

- Isometric & Perspective views
- Orbit, Pan, Zoom & Walkthrough tools
- Applying Visual Styles (Conceptual, Realistic, Wireframe)
- Creating Sectional Views of 3D models

Module 6: Materials, Lighting & Rendering

- Applying materials & textures
- Lights: Point, Spot, Distant & Sunlight

- Rendering basics & environment setup
- Creating realistic render images

Module 7: 2D Drawings from 3D Models

- Generating 2D views from 3D models
- Orthographic Projections & Sectional Views
- Dimensioning & Annotation of 3D drawings
- Layout & Plotting 3D models

Module 8: Final Project & Presentation

- Mechanical Project: 3D Machine Component
- Civil Project: Residential/Commercial 3D Plan
- Architectural Project: 3D Building Layout
- Final Presentation & Documentation