

Autodesk Civil 3D Training for Land Development & Surveying

1. TARGET AUDIENCE:

This course is designed for civil engineering students, BIM engineers, CAD technicians, surveyors, and land development professionals who want to master Autodesk Civil 3D for real-world projects. It is also beneficial for infrastructure engineers, site engineers, architects, urban planners, and professionals transitioning into BIM-based workflows.

2. COURSE OBJECTIVE:

The objective of this course is to provide a complete understanding of land development and surveying workflows using Autodesk Civil 3D. It focuses on transforming raw survey data into engineering models and developing surfaces, alignments, corridors, grading, parcels, and construction-ready outputs.

3. COURSE OUTCOMES:

By the end of the course, learners will be able to process survey data, create surfaces, design alignments and profiles, develop corridors, perform grading, create parcels, design basic drainage networks, generate quantities, and produce final plan sheets for land development projects.

4. COURSE OUTLINE:

The course comprises **40 hours** of theory and hands-on labs and is divided into **14 modules**. Each module includes practical exercises and assignments covering survey data processing, surface modeling, alignment and corridor design, grading, parcels, pipe networks, quantity takeoff, and a complete land development project.

TABLE OF CONTENTS

Module 1: Introduction to Civil 3D & Project Setup

- Overview of BIM in infrastructure projects
 - Civil 3D interface & workspace customization
 - Understanding Tool space, Prospector & Settings
 - Drawing templates (.dwt) and standards
 - Units, coordinate systems & drawing setup
 - Project folder structure (real-world workflow)
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Module 2: Survey Data Management (Core Foundation)

- Types of survey data (Total Station, GPS, Drone)
 - Importing survey data (CSV, TXT, FBK files)
 - Field Book (FBK) file processing
 - Survey Database creation & management
 - Figure Prefix Database (automatic linework)
 - Survey networks & adjustment basics
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Module 3: Points Management & COGO

- Creating & editing points (manual + import)
 - Point groups creation & control
 - Point styles & label styles
 - Point editing tools (elevation, description keys)
 - Description Key Sets automation
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Module 4: Surface Creation & Analysis

- Creating surfaces from:
 - Points
 - Contours
 - DEM files
- Surface properties & styles
- Breaklines & boundaries
- Surface editing (add/remove data)
- Contours generation
- Surface analysis:
 - Slope
 - Elevation

- Watershed

Module 5: Alignments (Road & Plot Layout)

- Creating alignments:
 - From objects
 - Layout tools
- Alignment geometry (tangents, curves, spirals)
- Editing alignments
- Stationing & labelling
- Creating offset alignments

Module 6: Profiles & Sections

- Creating surface profiles
- Profile view creation
- Designing vertical profiles
- Profile editing tools
- Sample lines creation
- Section views generation

Module 7: Corridors (Road Design Basics)

- Understanding assemblies
- Subassemblies & tool palettes
- Creating corridors
- Corridor surfaces
- Corridor editing & troubleshooting

Module 8: Grading & Site Development

- Grading concepts (cut & fill)
 - Grading creation tools
 - Feature lines creation & editing
 - Parcel grading workflows
 - Pond & platform grading
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Module 9: Parcels & Land Subdivision

- Creating parcels
 - Parcel styles & labels
 - Subdivision tools
 - Area calculations
 - Table generation
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Module 10: Pipe Networks (Basic Drainage)

- Creating pipe networks
 - Parts list & catalogue
 - Pipe & structure placement
 - Editing networks
 - Profile view for pipes
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Module 11: Quantity Takeoff & Reports

- Earthwork volume calculation
 - Cut & fill reports
 - Material quantity extraction
 - Generating reports
 - Export to Excel
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Module 12: Data Management & Collaboration

- Data shortcuts (DREF)
 - Xrefs workflow
 - Project sharing best practices
 - Working in teams (BIM workflow basics)
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Module 13: Plan Production & Sheets

- Creating sheets using Plan Production tools
 - View frames & sheet creation
 - Annotation scaling
 - Plotting & publishing
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Module 14: Real-Time Industry Project

Complete Land Development Project:

- Import survey data
 - Create surface
 - Design road alignment
 - Generate profiles & corridors
 - Perform grading
 - Create parcels
 - Generate sheets
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