



Project No. 4013CIV Date 2025 Doc. No. EOTSS4013 Serial No. 4013/2025 Rev. 00 sProj. dep. CIVIL

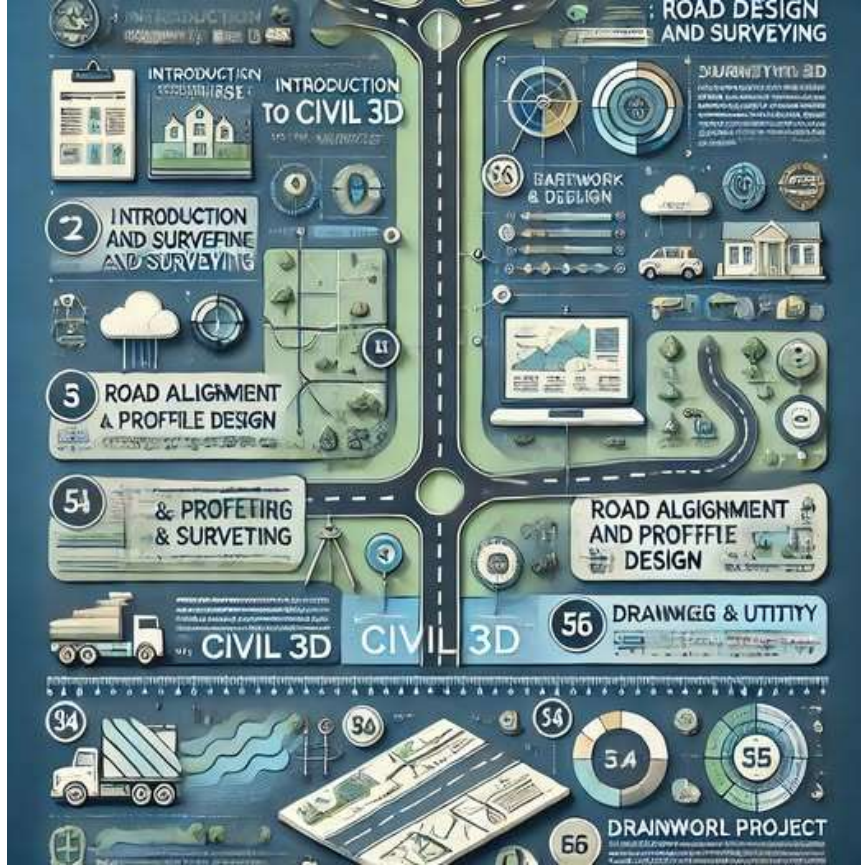
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المعهد الهندسي لخدمات التكنولوجيا والبرمجيات

Engineering office for Technology and Software Services



## Civil 3D: Road Design, Earthworks, and Surveying



### Civil 3D: Road Design, Earthworks, and Surveying

**Course Code:** 40013Soft-CIV

**Duration:** 4 Weeks (24–30 Hours)

**Delivery Format:** On-site / Online / Hybrid

**Level:** Intermediate

**Certification:** Civil 3D Engineering Application Certificate

### Introduction

Civil 3D by Autodesk is one of the most powerful and specialized software tools for civil engineers, offering advanced capabilities for designing roads, earthworks, stormwater, and sanitary systems. This course will equip engineers and technicians with the practical skills required to use Civil 3D effectively in real-world infrastructure projects.

Main Branch: United building – E Shams –Front NBE  
, El Siouf \_Alexandria

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## Course Description

This hands-on course introduces the core functionalities of **Autodesk Civil 3D**, focusing on **road alignment, terrain modeling, stormwater and sewer network design, and project documentation**. Participants will learn to create, analyze, and present civil infrastructure models using professional tools that enhance design accuracy and project efficiency.

## Target Audience

This course is ideal for:

- Civil engineers and designers working in infrastructure projects
- Road and utility network engineers
- Land surveyors and geospatial professionals
- Engineering students and recent graduates specializing in transportation or infrastructure
- BIM and CAD technicians in civil engineering firms

## What You Will Learn

By the end of this course, participants will be able to:

- Understand the interface and capabilities of Civil 3D in civil projects
- Create digital terrain models and contour maps from survey data
- Design horizontal and vertical road alignments
- Generate cross-sections, profiles, and earthwork volume calculations
- Plan and design stormwater and sanitary drainage networks
- Prepare construction-ready drawings and quantity takeoffs
- Complete a full infrastructure design project using Civil 3D

## Course Content

### Module 1: Introduction to Civil 3D

- Overview of Civil 3D environment and workflows
- Interface navigation and toolspace
- Understanding project templates and data management

### Module 2: Terrain and Surface Modeling

- Importing survey data (point files, GIS, CAD)
- Creating and editing TIN surfaces
- Generating contour maps and analyzing terrain

### Module 3: Road Design Fundamentals

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- Creating horizontal alignments
- Designing vertical profiles and assemblies
- Corridor modeling and cross-section generation

#### **Module 4: Earthworks and Volume Calculations**

- Cut and fill analysis
- Grading tools and surface comparisons
- Material volume reports

#### **Module 5: Stormwater and Sewer Network Design**

- Pipe network creation and layout
- Defining structures and parts lists
- Hydraulic analysis and network profiles

#### **Module 6: Documentation and Drawing Production**

- Plan and profile sheet generation
- Annotating drawings (stations, elevations, slopes)
- Quantity takeoff and scheduling

#### **Module 7: Capstone Project**

- Design of a complete roadway and drainage system for an urban development
- Compilation of drawings, reports, and presentation files



#### **Materials Included**

- Autodesk Civil 3D training manual (PDF)
- Sample survey and design files
- Templates for alignments, profiles, and cross-sections
- Quantity takeoff spreadsheets
- Project reference dataset
- Final certificate of completion



#### **Requirements / Instructions**

##### **Prerequisites:**

- Basic knowledge of AutoCAD
- Familiarity with civil engineering fundamentals (roads, drainage, surveying)

##### **Software Requirements:**

- Autodesk Civil 3D (2022 or newer) installed
- Access to a PC with sufficient specifications (16GB RAM, graphics card)

##### **Instructions for Participants:**

- Install and test Civil 3D before the first session
- Complete practical exercises after each module

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- Submit the final project design for evaluation

**Learning Outcomes**

After completing this course, participants will:

- Be proficient in using Civil 3D for road and drainage design
- Be able to create complete project documentation and drawings
- Understand terrain modeling, alignment geometry, and hydraulic layout
- Confidently use Civil 3D in consulting, contracting, or governmental projects

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