

Course Agenda



Module 01

UI Tour

This interactive session introduces the Civil 3D interface. It takes a guided tour of the available menus and the screen layout and introduce the basic functions associated with opening, navigating, closing, saving, and creating new files as a demonstration of the products capability. The following learning objectives are covered:

- Basic setup of the environment
- The ribbon and user interface terminology
- Tabs, panels, and tools
- Using the toolspace, panorama and the properties palettes
- Navigate the model, different file formats and their uses

This exercise provides practical examples on opening and saving files before exploring the various workspaces and their associated tools.

Module 02

Introduction to Styles

This module introduces styles, in Civil 3D styles are a collection of settings that control the appearance and behaviour of a Civil 3D object. Styles are applied to points, labels, objects and allow for the customisation of output and corporate image, such as drawing creation. The following learning objectives are covered:

- Introduction to styles
- Object and point styles
- Label and surface styles
- Dynamic relationships and BIM

This exercise provides practical examples on working with Object and Label styles, it creates a new style object prior to editing existing styles in a drawing.

Module 03

Point Files and Point Groups

This module introduces the concept of Field to Finish, the process of transforming raw field data into a finished drawing. It considers the first activities that are typically performed on a land development project, namely the definition of the existing topography from existing survey data, namely points and description keys. The following learning objectives are covered:

- Working with point files (survey and COGO points)
- Point settings and creating points
- Managing point groups
- Point reports and point label styles
- Description keys
- Importing survey data

This exercise comprises three parts and provides practical examples on managing point files, point groups and their styles, and finally how description key sets are applied.



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Module 04

Surface Creation, Modification, and Manipulation

This module begins with creating surfaces, adding points, and editing surface definitions. It continues with exploring the annotation of surface data to better communicate with other team members and concludes by explaining surface analysis options, and the tools to perform several visual checks on the terrain model. The following learning objectives are covered:

- Surface components and the surface creation process
- Surface types and surface rebuilding
- Adding Points to a surface and editing surface definitions
- Annotating surfaces, surface analysis and visual checks

This exercise provides practical examples of designing and manipulating surface definitions. It begins with creating surface templates, then adding point groups prior to adding points to a surface. It then considers editing and annotating the surface before performing analysis on the surface using slope arrows, elevation tables and visual checks.

Module 05

Land Development with Parcels

This module introduces the concept of parcels, and for the purposes of this module it considers a lot or plot, to be a tract or parcel of land owned by some owner(s). It begins by introducing parcels and parcel objects before exploring how to create parcels from existing objects. It considers editing parcels and finally, it discusses displaying the information with annotation and parcel tables. The following learning objectives are covered:

- Working with and creating parcels
- Converting basic AutoCAD objects
- Editing and annotating parcels, and parcel tables

This exercise provides practical examples of using objects to create parcels, importing a LandXML file and using the parcel tools to create a right of way. It explores the tools available to edit existing parcels, before concluding with annotation where it modifies numbers along the way to creating a parcel area table.

Module 06

Modelling New Terrain

This module considers the shaping of the land and the grading of areas, for example the shaping of individual lots to ensure the minimum earthworks are required, and the grading of the adjacent areas for services, such as stormwater management using ponds. The following learning objectives are covered:

- Creating feature lines and their design criteria
- Grading criteria, groups, sites, and constraints
- Grading surfaces and combining design surfaces
- Earthwork volume calculations

This exercise provides practical examples of using objects and spot elevations to define a sports field, and applying grading prior to considering the calculation of cut and fill and material balancing. It concludes by exploring the workflow for combining multiple surfaces, and the editing tools available to edit feature lines.

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Module 07

Geometric Design – Horizontal Design

This module introduces the concept of alignments, and begins by exploring the tools available to help create alignments, and the application of statutory design requirements to create an alignment. It continues by considering the options for editing an alignment before discussing design speeds and finally, we discuss displaying the alignment information using annotation styles and tables. The following learning objectives are covered:

- Horizontal alignments
- Alignment creation and design criteria
- Editing alignments
- Design speeds and annotating alignments

This exercise provides practical examples on creating and editing horizontal alignments. It begins with the creation of a horizontal alignment, and continues to explore the tools to edit an alignment, and finally the creation of a new design criteria file.

Module 08

Geometric Design – Vertical Design

This module begins by introducing some of the common terminology used, it considers the concept of vertical design using profiles, profile views and the various ways to display this information. It explores the types of layout and the variety of editing, annotating, and labelling tools available. The following learning objectives are covered:

- Surface profile layout and profile views
- Design profile layout and editing profiles
- Design criteria and annotating profiles
- Display design information in data bands

This exercise provides practical examples on vertical profile design. It begins with the creation of a surface profile using an alignment created earlier, and continues with applying design criteria to analyse and check the vertical profile.

Module 09

Geometric Design – Corridor Design

The two previous modules considered horizontal geometry with alignments, and vertical geometry with profiles, this module combines these with a cross section to develop a 3D corridor design. The following learning objectives are covered:

- Assemblies and subassemblies
- Baselines, regions, and targets
- Corridor surfaces, offset parameters and lane widening
- Design validation with drive analysis
- Intersections

This exercise provides practical examples on designing 3D roadway objects, and the main components of corridor design. It begins by creating an assembly with sub-assemblies, then creating a corridor using an alignment, then set a sidewalk baseline and split two regions. It continues with the creation of a combined corridor surface, with lane widening prior to concluding with corridor analysis using the design validation tools in the software.



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Module 10

Quantity Calculations and Cross Sections

This module begins by distinguishing the difference between sample lines and frequency lines. It introduces the section editor and sample line creation, and how these are used to generate section views, single and multiple. It considers the computing of materials for use in volume table calculations. Finally, it explains quantity takeoff criteria, cut and fill factors and the implications they have when calculating material quantities. The following learning objectives are covered:

- The section editor
- Frequency, and sample lines
- Single and multiple section views
- Quantity take-off criteria
- Cut and fill factors
- Cross section data
- Volume tables

This exercise provides practical examples on using alignments, sample line groups, quantity takeoff and material takeoff criteria to calculate and display section views with associated cut, fill and material quantities.

Module 11

Gravity Pipe Network Modelling and Analysis

This module introduces the concept of gravity pipe network design, this refers to the gravity-based object type and work best for sewer systems. It looks at the different workflows to model and edit a pipe network before exploring surface water runoff, catchment tools and how to view the network using alignment and profile views. Finally, it introduces storm and sanitary analysis tools and concludes with the annotation of views using labelling. The following learning objectives are covered:

- Gravity pipe networks
- Part catalogues and parts list
- Pipe network considerations
- Creating and editing a gravity pipe network
- Surface runoff conditions
- Catchment areas
- Alignments and profile tools
- Analyse and annotating pipe networks

This exercise provides practical examples of working with gravity pipe networks. It begins by setting up a pipe network catalogue, with pipes, structures, and rules, then it creates a parts list, and uses objects to model a network. It then uses a surface to create a catchment group, then creates an alignment using a pipe network and applies network rules to adjust any misplaced structures. Finally, it creates and places a pipe and structure table.

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Module 12

Pressure Network Modelling

This module introduces pressure network components, pipes, fittings, and appurtenances together with their catalogues and parts list. It considers editing styles and changing command settings before exploring the workflow to create pressure networks from objects and by layout. It continues with the editing options, using grips, and using the plan layout and profile layout tools. Finally, it concludes with checking the design using design checks and depth checks. The following learning objectives are covered:

- Network components
- Catalogues and parts list
- Creating and editing pressure pipe networks
- Performing design checks

This exercise provides practical examples of setting up a pressure network catalogue and parts list, before using XREF objects to help define a pressure pipe network.

Module 13

Production Drafting and Drawing Layouts

This module explores the plan production tools available to transform our 3D design to 2D drawings. It begins by introducing the plan production tools and objects, then it explores view frames and match lines before considering the editing options. It continues with creating sheets and concludes with sheet sets, their structuring, editing and properties. The following learning objectives are covered:

- Plan production using tools
- Creating view frames
- Plan production object edits
- Creating drawing sheets
- Sheet sets and their properties

This exercise provides practical examples of drawing production. It begins with producing a drafting template, then uses the wizard to create view frames before creating drawing sheets and sheet sets. It continues with creating section sheets, then adding them to an existing sheet, and finally it considers batch plotting and the sheet set manager.