

Autodesk Navisworks Essentials

Overview

This course is designed for new users of Autodesk Navisworks users for the review, 4D simulation, and clash testing, and presenting of existing 3D geometry files.

Prerequisites

It is recommended that delegates have a working knowledge of one or more of the following: Basic understanding of 3D design.

- Drafting, design or engineering principles
 - Experience with 3D modeling is recommended
 - Microsoft® Windows® Vista, Microsoft® Windows® XP, Microsoft® Windows® 7 or Microsoft® Windows® 8
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Course Outline

Navisworks in a nutshell

- A brief interactive session to enthuse the delegates and give a feel for the products capability
- Opening and appending a number of models Navigate the model Create an animation Run a simulation Perform an interference check Export a clash test report Material takeoff

Introducing Navisworks as a BIM tool

- Political positioning of Navisworks within the wider BIM context, this is a lecture only and will often be taken out and delivered as part of an executive overview
- What does Navisworks do?
 - Summary of Capabilities
 - Role in Construction and BIM
- What is BIM and what does it mean?
 - The Benefits of BIM
 - What will BIM Deliver?
 - BIM Enabled Tools
 - Where does Navisworks Fit?
- So who is BIM for and which of them will use it?
 - Industry Drivers
 - Team and Workflow Changes Implications on team and workflow; fees and deliverables; contract and insurance issues

UI Tour

- Interactive session introducing the menu and screen layout, important tools and dialogue locations followed by a tour through the basic project review features. This lecture is delivered through an interactive guided tour of a sample project
- Exploring the user interface
 - Application button, menu, Scene View
 - Quick Access Toolbar, Navigation bar
 - InfoCenter, Dockable windows
 - Ribbon, Status bar, using the commands
 - Menus, toolbar, ribbon, tooltips, keytips, navigation tools
 - Dockable windows, workspaces
 - Keyboard shortcuts
- Project navigation

Compiling and managing a project

- This module is presented as a lecture followed by an exercise, it provides an insight into the options and settings in Navisworks before exploring the large number of file formats and file readers available, and finally looking at how a project is compiled and the files saved and managed
- Options
 - File options
 - Global options
- File formats
 - Native - NWD, NWF and NWC
 - Compatible types File readers
- File exporters
- Appearance Profiler
- Managing files and batch utility
- View scene statistics and collaborate
- This exercise provides a practical example on the use and set-up of project units using file options, then appending files and transforming items, using the batch utility to combine

files ahead of publishing the combined project and finally we colour code objects in the model using the Appearance Profiler

Exploring the model

- This module introduces a number of the more commonly used navigation aids and tools. These are often used in combination to add realism to movement through the model and enhance model transition. Render styles are introduced to control model appearance and finally how settings are modified to impact on model performance
- Exploring the model
 - Navigating a scene, orientation in the model
- Controlling the realism
 - Speed, gravity, crouching, collision, third person
- Controlling model appearance
 - Render styles, mode, lighting, background and primitives
- Controlling render quality
- This exercise uses practical examples on the use of navigation tools to create realistic transitions, with differing render styles and backgrounds and the final part looks at using culling and clipping plane settings as a practical way to improve model performance when working with large models

Reviewing, redlining, links and SwitchBack

- This module focuses on how a model is reviewed, using the find and compare tools, and how annotation, redlines and data can be attached to objects in order to highlight and comment on coordination issues. We review how SwitchBack workflow is used in different project environments
- Interactive geometry
- Find and compare objects
- Manipulate and transform objects
- Redlining, comments and tags
- Links to objects and Switchback
- The exercise covers the use of the find and compare tools, how objects attributes are manipulated, redlining, adding links and comments and ends with using switchback to provide a practical example of issue resolution

Viewpoint creation, sectioning and animation

- This module is presented as a lecture followed by an exercise, begins with the creation and modifying of model viewpoints, and then looks at the use of sectioning to create more focused views of the model and finally these viewpoints are used to create animations to be saved as video files
- Viewpoints and sectioning
 - Using viewpoints
 - Sectioning planes and boxes
- Record and play animations
 - Viewpoint animations
 - Interactive animations
 - Create and export as videos and slideshows

- This exercise provides a number of practical examples on the creation and manipulation of viewpoints and how the sectioning tools are used to produce cut-away focused views. It continues with creating animations using the two methods of interactive recording and viewpoint transitions and concludes with the combining of the different viewpoints and animations into videos and slideshows

Animation and Interactivity

- This lecture and associated exercise introduces delegates to the animator and the scripter tools. It explores how these are used in combination to produce animations and then add interactivity using scripts that based upon events and actions
- Animator overview
 - Create object animations
- Scripter overview
 - Add events and actions
- Creating videos of the events
- The exercise provides a number of practical examples on the basics of using the animator to produce object animations, then adding interactivity to them via the scripter, and finally linking them together. For example, a door will open (animation) as it is approached (script) in the model

Autodesk Rendering

- This lecture and the accompanying exercise introduces delegates to the numerous and varied Autodesk rendering tools available. It introduces the standard Autodesk Material Library together with the concept of applying materials and lighting, to object items and the model to improve visualisation and increase realism, and once applied, how these are then used to produce high quality photorealistic renders of the model
- Autodesk Rendering overview
- Applying materials and lighting to model objects
- Modifying object materials, user libraries
- Rendering options with Ray Trace and Autodesk - Cloud and Render Gallery
- This exercise provides a number of practical examples on the basics of working with the Autodesk standard material library, how to use the tools to apply materials and effects to the model in order to ultimately produce high quality true to life visual representations of the model, and introduces Autodesk Rendering in the cloud and the render gallery

Simulation and the TimeLiner

- This lecture and the associated exercise takes a look at the simulation of construction scheduling using the TimeLiner tool and how it links to external task scheduling software to produce 4D simulations. The addition of animation to the simulations and the export thereof completes this module
- TimeLiner overview
- Linking objects with tasks
- Links to external scheduling files and 4D simulation
- Import and export of data
- The exercises provide a number of examples on the basics of working with the TimeLiner tools, how to apply tasks to model objects and assign construction times for them, import

and export data to other software programmes such as MS Project, and finally playing simulations and creating videos of the construction simulation

Interference management - Clash Detective

- This lecture and associated exercise explores the clash detective tool, arguably Navisworks greatest strength is its ability to identify, inspect and then report on interferences. When linked to the TimeLiner and object animation it has the ability to perform time based object collision detection on moving objects
- Clash detective overview
- Enhanced tests using search and selection sets
- Using Rules, resolving issues with Switchback
- Time based clash tests, reviewing results and reports
- The exercises begin by running a simple clash check and progresses to narrowing the test. It looks at the results and how they are presented and used for reporting purposes, it continues with using switchback to resolve collisions and concludes with linking clash tests to TimeLiner for time based clash testing. The exercise ends with the creation of reports in a number of file formats

Material Takeoff - Quantification

- This lecture and associated exercise explores the quantification workbook, and provides an insight into how it uses catalogs, work breakdown structures, 2D worksheets, 3D model objects and their properties, to perform a material takeoff of the aggregated model. This powerful tool can combine 2D worksheets, 3D model objects, with or without properties, with easy to apply formulas to quickly quantify items directly into work packages that are formatted to suit company catalogs or recognised standard methods of measurement, such as Unifomat, SMM7, NRM, etc.
- Quantification overview
- Creating work breakdown structures
- Develop catalogs, groups, items and resources
- Using model variables and formulas
- 2D and 3D Model object and virtual takeoff
- Importing and exporting catalogs and results
- The final exercise begins with importing a catalog and setting up the measurement units. It then explores creating catalogs, for both items and resources, and work breakdown structures, it continues with using model variables as a basis for developing formulas to quantify objects prior to performing a material takeoff of the aggregated model where both 2D worksheets and 3D model objects are quantified. The exercise ends with the export of the catalog and the takeoff results