

TABLE OF CONTENTS

Dedication	iii
Foreword	iv
Acknowledgements	v
About the Author	vi
Accessing Tutorial Files	vii
Free Teaching Resources for Faculty	viii
Accessing the Videos of the Tutorials in this Textbook	viii
Preface	ix
Table of Contents	xi
Chapter 1 - Introduction to Autodesk Navisworks	
Autodesk Navisworks	1-2
Autodesk Navisworks Products	1-2
Autodesk Navisworks Simulate	1-2
Autodesk Navisworks Manage	1-3
Autodesk Navisworks Freedom	1-3
Autodesk Navisworks Interface	1-4
Autodesk Navisworks Interface Components	1-4
Autodesk Navisworks Workspaces	1-7
Safe Mode	1-8
Navisworks Minimal	1-8
Navisworks Standard	1-8
Navisworks Extended	1-9
Creating a User-Defined Workspace	1-9
Native File Support	1-10
Autodesk Navisworks NWC File Export Utility	1-11
Autodesk Navisworks File Formats	1-11
NWC Files	1-11
NWF Files	1-11
NWD Files	1-12
Collaborating Designs in Autodesk Navisworks	1-12
Opening Files	1-12
Opening From Web Server	1-14
Appending Files	1-14
Merging Files	1-15
Scene Statistics	1-16
Sheet Browser	1-16
Saving Your Work	1-18
Save Tool	1-19
Save As Tool	1-19
Publish Tool	1-20
Auto-Save	1-23
Deleting Files From the Scene	1-24

Navigating Through the Model	1-24
Steering Wheels	1-25
Zoom Tools	1-28
Orbit Tools	1-28
Focus Tool	1-29
Changing the Camera Options	1-29
Field of View (F.O.V.) Slider	1-29
Perspective Flyout	1-30
Align Camera Flyout	1-30
Show Tilt Bar	1-30
Position Entry Boxes	1-30
Look At Entry Boxes	1-31
Roll Spinner	1-31
Changing the Render Style Options	1-31
Lighting Flyout	1-31
Render Mode Flyout	1-32
Surfaces	1-32
Lines	1-32
Points	1-33
Snap Points	1-33
Text	1-33
ViewCube	1-33
Hands-On Exercise (Plant)	1-35
Hands-On Exercise (BIM)	1-44
Skill Evaluation	1-53
Class Test Questions	1-54

Chapter 2 - Selecting and Manipulating Objects in the Scene

Object Selection	2-2
Selection Resolution	2-2
Select Flyout	2-4
Select All Flyout	2-5
Select Same Flyout	2-5
Selection Tree	2-6
Controlling the Visibility of the Objects	2-7
Hide	2-7
Require	2-8
Hide Unselected	2-8
Unhide All	2-8
Unrequire All	2-8
Item Tools	2-8
Transform Ribbon Panel	2-9
Appearance Ribbon Panel	2-11
Modifying Units, Size, and Location of a CAD File	2-12
Selection Sets and Search Sets	2-13
Selection Sets	2-14
Search Sets	2-15

Viewing Object Properties	2-20
Creating Custom Properties	2-20
Dynamically Displaying Object Properties on the Model	2-21
Selection Inspector	2-23
Appearance Profiler	2-24
Hands-On Exercise (Plant)	2-27
Hands-On Exercise (BIM)	2-43
Skill Evaluation	2-60
Class Test Questions	2-61

Chapter 3 - Viewpoints, Animations, and Measurements

Realtime Navigation in the Design	3-2
Walk Tool	3-2
Steering Wheel > Walk	3-2
Fly Tool	3-3
Controlling the Object Drop Outs During Navigation	3-4
Reducing the Object Drop Outs Using the File Options	3-4
Stopping Object Drop Outs Using the Options Editor	3-5
Viewpoints	3-6
Creating Viewpoints	3-6
Viewpoint Shortcut Menu	3-7
Adding Realism to the Navigation	3-12
Third Person	3-12
Gravity	3-15
Collision	3-15
Crouching	3-15
Global Viewpoint Default Settings	3-16
Creating Walkthrough Animations	3-17
Recording the Walk	3-17
Creating Viewpoint Animation	3-18
Playing the Animations	3-19
Combining Multiple Animations	3-19
Exporting Animations	3-20
Exporting and Importing Viewpoints	3-21
Measuring Objects	3-22
Measuring Point to Point Distance	3-23
Clearing Measurement	3-23
Measuring Point to Multiple Points	3-24
Measuring Point Line	3-24
Measuring Accumulated Distances	3-26
Measuring Angles	3-26
Measuring Area	3-26
Measuring Shortest Distance Between Two Objects	3-27
Transforming Objects	3-27
Converting Measurements to Redline	3-28
Locking Measurements	3-28
Changing the Display of Measurements	3-29

Hands-On Exercise (Plant)	3-30
Hands-On Exercise (BIM)	3-47
Skill Evaluation	3-65
Class Test Questions	3-66

Chapter 4 - Reviewing and Sectioning the Design

Design Review in Autodesk Navisworks	4-2
Redline Markups	4-2
Comments	4-8
Adding Comments to a Saved Viewpoint	4-10
Adding Comments to a Saved Viewpoint Animation	4-11
Adding Comments to a Selection Set or a Search Set	4-11
Finding Comments	4-12
Quick Find Comments	4-14
Editing Comments	4-15
Renumbering Comment IDs	4-16
Tags	4-16
Add Tags	4-16
Searching Tag IDs	4-17
Renumbering Tag IDs	4-17
Sectioning the Model	4-17
Sectioning a Model Using a Single Section Plane	4-18
Sectioning a Model Using Multiple Section Planes	4-20
Sectioning a Model Using Linked Section Planes	4-22
Sectioning a Model Using a Section Box	4-23
Saving a Sectioned View	4-24
Hands-On Exercise (Plant)	4-25
Hands-On Exercise (BIM)	4-41
Skill Evaluation	4-57
Class Test Questions	4-58

Chapter 5 - Autodesk Navisworks Productivity Tools

Displaying Grids and Levels in an Autodesk Revit File	5-2
Linking Files and URLs to the Objects in the Scene	5-4
Adding Links to the Objects in the Scene	5-5
Turning On the Visibility of the Links in the Scene	5-7
Controlling the Global Display of Links	5-7
Editing the Links Assigned to the Objects	5-8
Following the Links Assigned to the Objects	5-9
Comparing Models or Objects in the Scene	5-9
Procedure for Comparing the Models	5-11
Linking External Databases to the Autodesk Navisworks Objects	5-12
Getting a 64-Bit Computer Ready to Use DataTools	5-13
Linking Database Properties	5-13
SQL Query Strings	5-16
Working With the Batch Utility Tool	5-17

Splitting the Autodesk Navisworks View	5-21
Working With the Full Screen Display	5-22
The SwitchBack Functionality	5-23
Hands-On Exercise (Plant)	5-26
Hands-On Exercise (BIM)	5-40
Skill Evaluation	5-54
Class Test Questions	5-55

Chapter 6 - Working with the Autodesk Rendering Module

Creating Photorealistic Renderings	6-2
The Autodesk Rendering Window	6-2
Materials Tab	6-2
Procedure for Assigning Materials Using the Autodesk Rendering Window	6-4
Procedure for Adding Materials to the Favorites Library	6-4
Material Mapping Tab	6-4
Procedure for Changing the Material Mapping Type	6-6
Procedure for Changing the Material Mapping Options	6-6
Lighting Tab	6-6
Procedure for Adding a Point Light to the Scene	6-7
Procedure for Adding a Spot Light to the Scene	6-9
Procedure for Adding a Distant Light to the Scene	6-10
Procedure for Adding a Web Light to the Scene	6-11
Environments Tab	6-12
Settings Tab	6-14
Location Settings	6-14
Ray Trace Rendering of the Autodesk Navisworks Scene	6-16
Pausing/Stopping Interactive Rendering	6-16
Saving Rendered Images	6-17
Rendering in Cloud	6-17
Previewing and Downloading Rendered Images from the Autodesk 360	
Cloud Render Gallery	6-19
Hands-On Exercise (Plant)	6-22
Hands-On Exercise (BIM)	6-33
Skill Evaluation	6-45
Class Test Questions	6-46

Chapter 7 - Working with the Animator and Scripter Modules

The Animator Module	7-2
Animator Toolbar	7-2
Animator Tree View	7-4
Animator Timeline View	7-6
Procedure for Creating Animator Animations	7-6
Animating the Object Transformation	7-6
Controlling the Transparency of the Objects in the Animation Set	7-8
Changing the Color of the Objects in the Animation Set	7-9
Adding a Blank Camera Animation to the Animator Scene	7-10
Adding a Saved Viewpoint Animation to the Animator Scene	7-11

Adding a Section Plane Animation to the Animator Scene	7-11
The Scriptor Module	7-12
Scripts Area	7-12
Events Area	7-12
Actions Area	7-15
Enabling the Scripts	7-17
Procedure for Adding Interactivity to the Model Using Scripts	7-17
Exporting Animations	7-18
Hands-On Exercise (Plant)	7-20
Hands-On Exercise (BIM)	7-41
Skill Evaluation	7-61
Class Test Questions	7-62

Chapter 8 - Creating Construction Simulations Using the TimeLiner Module

The Timeliner Module	8-2
Tasks Tab	8-2
Data Sources Tab	8-8
Configure Tab	8-10
Simulate Tab	8-11
Procedure for Automatically Adding Tasks	8-14
Automatically Adding Tasks For Every Topmost Layer	8-15
Automatically Adding Tasks For Every Topmost Item	8-16
Automatically Adding Tasks For Every Set	8-17
Procedure for Automatically Attaching Items to the Tasks Using Rules	8-18
Procedure for Importing Scheduling Tasks By Linking External Project Files	8-19
Linking CSV Files	8-20
Linking Microsoft Project MPX Files	8-22
Linking Primavera Project Management 6-8 Schedules	8-22
Linking Primavera P6 (Web Services) V6 - V8.5	8-23
Procedure for Customizing the Simulation Overlay Text	8-24
Procedure for Adding an Animator Camera Animation As a Task	8-25
Procedure for Linking a Viewpoint Animation or an Animator Camera Animation to the Simulation	8-26
Hands-On Exercise (Plant)	8-27
Hands-On Exercise (BIM)	8-41
Skill Evaluation	8-59
Class Test Questions	8-60

Chapter 9 - Introduction to the Quantification Module

The Quantification Module	9-2
Types of Quantity Takeoffs	9-3
Model Quantity Takeoff	9-3
2D Quantity Takeoff	9-3
Virtual Quantity Takeoff	9-3
The Quantification Workbook	9-4
Item and Resource Catalogs	9-12

Item Catalog	9-12
Resource Catalog	9-13
Takeoff Property Mapping	9-13
Procedures Required While Working With the Quantification Module	9-14
Procedure for Mapping Properties of Individual Catalog Items	9-14
Procedure for Globally Mapping Takeoff Properties	9-15
Procedure for Adding Groups And Items to the Item Catalog	9-16
Procedure for Exporting Catalogs	9-17
Procedure for Selecting a User-Defined Catalog in a New Project	9-18
Procedure for Importing a User-Defined Catalog in an Existing Project	9-18
Procedure for Performing Model Takeoffs	9-19
Procedure for Performing 2D Takeoffs	9-19
Procedure for Performing Virtual Takeoffs	9-19
Procedure for Exporting the Quantities to Microsoft Excel	9-21
Getting Autodesk Navisworks Ready to Perform Model Takeoff From the AutoCAD Plant 3D Files	9-21
GUID Property For Quantity Takeoff	9-22
Hands-On Exercise (Plant)	9-23
Hands-On Exercise (BIM)	9-34
Skill Evaluation	9-47
Class Test Questions	9-48

Chapter 10 - Working with the Clash Detective Module

The Clash Detective Module	10-2
Tests Panel	10-2
Clash Toolbar	10-4
Rules Tab	10-5
Select Tab	10-5
Results Tab	10-7
Report Tab	10-13
Procedure for Performing Various Clash Test Related Activities	10-15
Procedure for Performing Hard Clash Tests	10-15
Procedure for Interrogating the Clash Results	10-16
Procedure for Writing the Clash Report	10-17
Procedure for Resolving the Clashes Using the Switchback Functionality	10-17
Procedure for Linking a TimeLiner Simulation or an Animator Scene to the Clash Test	10-20
Procedure for Exporting and Importing Clash Tests	10-22
Hands-On Exercise (Plant)	10-24
Hands-On Exercise (BIM)	10-43
Skill Evaluation	10-61
Class Test Questions	10-62

Chapter 11 - Autodesk Navisworks for Autodesk Factory Design Suite

Autodesk Navisworks for the Autodesk Factory Design Suite Users	11-2
Project	11-2

Chapter 12 - BIM Data Collaboration with Autodesk BIM 360 Glue

Autodesk BIM 360	12-2
Autodesk BIM 360 Glue Project	12-3
Index	I-1
Answers to Skill Evaluation	A-1
Appendix: Add-Ins for BIM Data Coordination	1

For Evaluation Only. Copyrights
Deepak Maini
www.deepakmaini.com

For Evaluation Only. Copyrights
Deepak Maini
www.deepakmaini.com