

Autodesk® 3ds Max® Design 2014 Fundamentals



Visit the following websites to learn more about this book:



Table of Contents Part 1

| | |
|--|-------------|
| Preface | vii |
| Class Files | ix |
| Chapter 1 Introduction to Autodesk 3ds Max Design | 1-1 |
| 1.1 Overview | 1-3 |
| 1.2 Visualization Workflow | 1-7 |
| 1.3 The Autodesk 3ds Max Design Interface | 1-11 |
| 1.4 Preferences | 1-30 |
| 1.5 Setting the Project Folder | 1-33 |
| 1.6 Configure Paths | 1-34 |
| 1.7 Display Drivers | 1-37 |
| 1.8 Viewport Display and Labels | 1-39 |
| Practice 1a Organizing Folders and Working with the Interface | 1-44 |
| Practice 1b Autodesk 3ds Max Design Quickstart..... | 1-57 |
| Chapter 2 Autodesk 3ds Max Design Configuration | 2-1 |
| 2.1 Viewport Navigation | 2-3 |
| 2.2 Viewport Configuration | 2-8 |
| Practice 2a Viewport Configuration and Navigation | 2-13 |
| 2.3 Object Selection Methods | 2-18 |
| Practice 2b Selection Methods | 2-20 |
| 2.4 Units Setup | 2-23 |
| Practice 2c Working with Units Setup | 2-26 |
| 2.5 Layer and Object Properties | 2-27 |
| Practice 2d Layer and Object Properties | 2-33 |
| Chapter 3 Assembling Project Files | 3-1 |
| 3.1 Data Linking and Importing | 3-3 |
| Practice 3a Ground Surfaces using Civil View | 3-6 |
| 3.2 Linking Files | 3-13 |
| Practice 3b Linking an AutoCAD DWG..... | 3-27 |
| Practice 3c Linking and Reloading Autodesk Revit File | 3-35 |
| 3.3 References | 3-42 |
| Practice 3d XRef and Merge Objects | 3-44 |

| | |
|---|-------------|
| Chapter 4 Basic Modeling Techniques | 4-1 |
| 4.1 Model with Primitives | 4-3 |
| Practice 4a Modeling with Primitives | 4-5 |
| 4.2 Modifiers and Transforms..... | 4-9 |
| Practice 4b Modeling with Modifiers and Transforms | 4-14 |
| 4.3 Sub-Object Mode | 4-23 |
| Practice 4c Modeling with Edit Poly in Sub-Object Mode | 4-27 |
| 4.4 Reference Coordinate Systems and Transform Centers . | 4-32 |
| Practice 4d Modeling with Coordinate Systems | 4-35 |
| 4.5 Cloning and Grouping..... | 4-38 |
| Practice 4e Cloning and Grouping..... | 4-41 |
| 4.6 Polygon Modeling Tools in the Ribbon | 4-45 |
| Practice 4f Poly Modeling using the Ribbon | 4-46 |
| 4.7 Statistics in Viewport | 4-64 |
| Chapter 5 Modeling From 2D Objects | 5-1 |
| 5.1 3D Modeling from 2D Objects..... | 5-3 |
| Practice 5a Drawing Lines | 5-6 |
| 5.2 The Lathe Modifier..... | 5-13 |
| Practice 5b Creating a Candlestick..... | 5-14 |
| 5.3 2D Booleans | 5-17 |
| Practice 5c 2D Booleans | 5-19 |
| 5.4 The Extrude Modifier | 5-24 |
| 5.5 Boolean Operations..... | 5-28 |
| Practice 5d Extrude Walls and Create Wall Openings | 5-32 |
| 5.6 Using Snaps for Precision | 5-41 |
| Practice 5e Creating a Door with Snaps..... | 5-46 |
| 5.7 The Sweep Modifier | 5-52 |
| Practice 5f Sweeping the Wall Baseboard..... | 5-55 |
| Chapter 6 Materials | 6-1 |
| 6.1 Introduction to Materials..... | 6-3 |
| 6.2 Understanding Maps and Materials | 6-5 |
| 6.3 Managing Materials | 6-8 |
| Practice 6a Introduction to Materials | 6-18 |
| 6.4 Standard Materials..... | 6-27 |
| 6.5 Material Shaders | 6-31 |
| 6.6 Assigning Maps to Materials | 6-35 |
| Practice 6b Working with Standard Materials and Maps | 6-37 |
| Practice 6c Working with Multi/Sub-Object Materials | 6-49 |

| | |
|--|-------------|
| 6.7 Opacity, Bump, and Reflection Mapping | 6-59 |
| Practice 6d Opacity and Bump Mapping | 6-62 |
| 6.8 mental ray Materials | 6-71 |
| Practice 6e Working with mental ray Materials..... | 6-76 |
| 6.9 The Material Explorer | 6-85 |
| Chapter 7 Mapping Coordinates and Scale | 7-1 |
| 7.1 Mapping Coordinates | 7-3 |
| Practice 7a Applying Mapping Coordinates..... | 7-9 |
| Practice 7b Mapping a Large Scale Image | 7-13 |
| 7.2 Mapping Scale | 7-17 |
| Practice 7c Assigning Map Scales..... | 7-21 |
| 7.3 Spline Mapping | 7-28 |
| Practice 7d Spline Mapping | 7-29 |
| Chapter 8 Introduction to Lighting | 8-1 |
| 8.1 Local vs. Global Illumination | 8-3 |
| 8.2 Standard Lighting | 8-9 |
| 8.3 Types of Standard Lights | 8-12 |
| Practice 8a Standard Lighting for an Interior Scene | 8-17 |
| 8.4 Shadow Types | 8-31 |
| Practice 8b Working with Shadow Parameters..... | 8-39 |
| Chapter 9 Lighting and Rendering | 9-1 |
| 9.1 Photometric Light Objects | 9-3 |
| Practice 9a Working with Photometric Lights | 9-13 |
| Practice 9b Materials that Create Lighting..... | 9-21 |
| 9.2 Exposure Control | 9-25 |
| Practice 9c Working with Exposure Control..... | 9-31 |
| 9.3 Daytime Lighting | 9-37 |
| Practice 9d Lighting Using Image Based Lighting | 9-44 |
| Practice 9e Lighting for an Exterior Scene with mental ray Daylight | 9-49 |
| Practice 9f Viewport Lighting and Shadows | 9-54 |
| Chapter 10 mental ray Rendering | 10-1 |
| 10.1 Fundamentals of mental ray | 10-3 |
| 10.2 mental ray Interior Rendering | 10-6 |

| | |
|---|--------------|
| 10.3 Controlling mental ray Quality | 10-22 |
| Practice 10a Improving mental ray Speed, Quality, and using Material Overrides | 10-24 |
| Practice 10b Adding a Sky Portal for Interior Lighting from Daylight | 10-37 |
| 10.4 mental ray Proxies | 10-43 |
| Practice 10c mental ray Proxies | 10-44 |
| Chapter 11 Rendering and Cameras | 11-1 |
| 11.1 Rendering Options | 11-3 |
| Practice 11a Working with Rendering Options | 11-12 |
| 11.2 Rendering Presets | 11-17 |
| 11.3 Single vs. Double-Sided Rendering | 11-18 |
| Practice 11b Double-Sided Rendering Mode | 11-24 |
| 11.4 State Sets | 11-27 |
| 11.5 Cameras | 11-30 |
| 11.6 Background Images | 11-34 |
| Practice 11c Cameras and Background Images | 11-41 |
| 11.7 The Print Size Wizard | 11-52 |
| Practice 11d Using the Print Size Wizard | 11-53 |
| Chapter 12 Animation | 12-1 |
| 12.1 Animation and Time Controls | 12-3 |
| 12.2 Walkthrough Animation | 12-13 |
| Practice 12a Creating a Turntable Animation | 12-15 |
| Practice 12b Keyframing a Camera Animation | 12-25 |
| Practice 12c Creating a Walkthrough Animation | 12-32 |
| 12.3 Animation Output | 12-38 |
| Practice 12d Creating Animation Output | 12-40 |
| Appendix A Optional Topics | A-1 |
| A.1 Getting Help with Autodesk 3ds Max Design | A-3 |
| A.2 Compact Material Editor | A-6 |
| A.3 Architectural Materials | A-10 |
| A.4 Object Substitution | A-15 |
| Practice A1 Substituting the Parking Lot Light Poles | A-16 |
| A.5 Lighting Analysis | A-20 |
| Practice A2 Conduct a Lighting Analysis | A-26 |
| A.6 Creating Hierarchies | A-32 |
| Practice A3 Create Hierarchies | A-33 |
| Practice A4 Create an Assembly Animation | A-35 |

| | |
|--|-------------|
| A.7 Customizing the User Interface..... | A-38 |
| Practice A5 Customizing the User Interface | A-40 |
| Appendix B Optional Practices..... | B-1 |
| Practice B1 Create Additional Extrusions | B-3 |
| Practice B2 Making a Chair Base by Lofting Objects | B-5 |
| Practice B3 Using the mental ray Multi/Sub-Map Shader .. | B-12 |
| Practice B4 Shadow Study Animation | B-23 |
| Practice B5 Assigning the Renderable Spline Modifier | B-27 |
| Practice B6 Using Script for Converting Materials..... | B-31 |
| Appendix C Autodesk 3ds Max 2014 Certified Professional Exam Objectives | C-1 |