

# Table of Contents

<b>Dedication</b>	iii
<b>Preface</b>	xvii

## **Chapter 1: Introduction to Autodesk Revit Architecture 2011**

Introduction to Autodesk Revit Architecture	1-2
Autodesk Revit Architecture as a Building Information Modeler	1-2
Basic Concepts and Principles	1-2
Understanding the Parametric Building Modeling Technology	1-4
Terms used in Autodesk Revit Architecture	1-4
Creating a Building Model Using Parametric Building Elements	1-6
Visibility/Graphics Overrides, Scale, and Detail Level	1-8
Extracting the Project Information	1-8
Creating an Architectural Drawing Set	1-8
Creating an Unusual Building Geometry	1-8
Flexibility of Creating Special Elements	1-9
Creating Structural Layouts	1-9
Working on Large Projects	1-9
Working in Large Teams and Coordinating with Consultants	1-9
Starting Autodesk Revit Architecture 2011	1-10
User Interface	1-11
Invoking Tools	1-12
Title Bar	1-12
Ribbon <i>Enhanced</i>	1-12
Application Frame	1-14
Status Bar	1-16
View Control Bar	1-16
Options Bar	1-17
Type Selector <i>Enhanced</i>	1-17
Drawing Area	1-17
Project Browser	1-17
Properties Palette <i>New</i>	1-18
Keyboard Accelerators	1-18
Dialog Boxes	1-19
Multiple Document Environment	1-20
Interoperability of Autodesk Revit Architecture	1-21

Building Information Modeling and Autodesk Revit Architecture 2011	1-21
Autodesk Revit Architecture Help	1-21
Autodesk Revit Architecture User Assistance	1-22
Context Sensitive Help	1-24
User Interface Overview	1-24
Tutorials	1-24

## Chapter 2: Getting Started with Revit Architecture

Starting a New Project	2-2
Setting Units	2-3
Length Unit Setting	2-3
Area Unit Setting	2-5
Volume and Angle Unit Settings	2-5
Slope Setting	2-5
Currency Setting	2-5
Snap Settings	2-6
Dimension Snaps	2-6
Object Snaps	2-6
Temporary Overrides	2-8
Saving a Project	2-8
Using the Save As Tool	2-8
Using the Save Tool	2-10
Configuring Global Settings <i>Enhanced</i>	2-11
General Tab	2-11
User Interface Tab <i>New</i>	2-13
Graphics Tab	2-13
File Locations Tab	2-13
Rendering Tab	2-14
Spelling Tab	2-14
SteeringWheels Tab <i>Enhanced</i>	2-15
ViewCube Tab	2-17
Closing a Project	2-18
Exiting a Project	2-19
Opening an Existing project	2-19
Opening an Existing Project Using the Open Tool	2-19
Model Display Tools	2-22
Using the Zoom Tools	2-22
Using the Orient Tool	2-24
Navigation Tools	2-25
Other Display Options	2-28
Tutorial 1 - Apartment 1	2-29
Tutorial 2 - Club	2-32
Self-Evaluation Test	2-34
Review Questions	2-35
Exercise 1 - Apartment 2	2-36
Exercise 2 - ELevator and Stair Lobby 2	2-36

### Chapter 3: Creating the First Project

Creating a Building Project	3-2
Sequence of Creating a Building Model	3-2
Understanding Wall Types	3-3
Creating Walls	3-4
Wall Properties	3-4
Sketching Walls	3-10
Sketching Interior Walls	3-16
Tutorial 1 - Apartment 1	3-19
Tutorial 2 - Club	3-26
Tutorial 3 - Apartment 1 - Interior Walls	3-31
Tutorial 4 - Club - Interior Walls	3-39
Self-Evaluation Test	3-43
Review Questions	3-44
Exercise 1 - Apartment 2	3-44
Exercise 2 - Elevator and Stair Lobby	3-45
Exercise 3 - Club-Interior Walls	3-45

### Chapter 4: Using Basic Building Components-I

Using Doors in a Building Model	4-2
Adding Doors	4-2
Understanding Door Properties	4-3
Adding a Door to a Wall	4-6
Using Windows in a Building Model	4-9
Adding Windows	4-9
Understanding Window Properties	4-10
Adding a Window to a Wall	4-13
Doors and Windows as Wall Openings	4-15
Tutorial 1 - Apartment 1	4-16
Tutorial 2 - Club	4-26
Self-Evaluation Test	4-32
Review Questions	4-32
Exercise 1 - Apartment 2	4-33
Exercise 2 - Elevator and Stair Lobby	4-34
Exercise 3 - Club - Hall 2	4-35

### Chapter 5: Using the Editing Tools

Creating a Selection Set	5-2
Selecting Multiple Elements	5-2
Restoring the Selection	5-3
Removing Elements from a Selection	5-3
Moving and Copying Elements	5-4
Changing the Temporary Dimensions	5-4
Using the Drag Option	5-4
Dragging End-joined Components	5-5

Using the Move Tool	5-6
Using the Copy Tool	5-6
Trimming and Extending Elements	5-7
Using the Trim/Extend to Corner Tool	5-8
Using the Trim/Extend Single Element Tool	5-8
Using the Trim/Extend Multiple Elements Tool	5-9
Cutting and Pasting Elements	5-10
Cutting Elements	5-10
Copying Elements to the Clipboard	5-11
Pasting Elements from the Clipboard	5-11
Rotating Elements	5-12
Mirroring Elements	5-14
Using the Pick Mirror Axis Option	5-14
Using the Draw Mirror Axis Option	5-14
Creating an Offset	5-15
Creating an Array of Elements	5-17
Linear Array	5-18
Radial Array	5-20
Matching Elements	5-20
Aligning Elements and Working with Constraints	5-22
Deleting Elements	5-22
Split Element	5-22
Split with Gap	5-25
Grouping Elements	5-25
Creating Groups by Selecting Elements in the Project Views	5-25
Creating Groups Using the Group Editor	5-26
Creating a Detail Group	5-26
Creating Model and Attached Detail Groups	5-27
Placing Groups	5-28
Swapping Groups	5-28
Modifying Groups	5-29
Excluding Elements from a Group	5-29
Saving and Loading Groups	5-29
Converting Groups to Linked Models	5-30
Deleting Groups	5-31
Creating Similar Elements	5-32
Pinning Elements	5-32
Scaling Elements	5-33
Using Diagnostic Tools	5-34
Measuring Distance between References and Along an Element	5-34
Selecting Elements Using the Element ID	5-35
Tutorial 1 - Apartment 1	5-36
Tutorial 2 - Club	5-41
Self-Evaluation Test	5-47
Review Questions	5-48
Exercise 1 - Apartment 2	5-49
Exercise 2 - Club	5-49

Exercise 3 - Elevator and Stair Lobby	5-50
Exercise 4 - Office	5-51

## Chapter 6: Working with Datum and Creating Standard Views

Working with Levels	6-2
Understanding Level Properties	6-3
Adding Levels	6-6
Modifying Level Parameters	6-8
Hiding Elements in a View	6-9
Controlling the Visibility of Levels	6-10
Working with Grids	6-10
Creating Grids	6-10
Modifying Grids	6-15
Grid Properties	6-16
Customizing the Grid Display	6-20
Controlling the Visibility of Grids	6-20
Reference Planes	6-21
Work Planes	6-21
Setting the Work Plane	6-21
Controlling the Visibility of Work Planes	6-22
Working with Project Views	6-22
Viewing the Building Model	6-23
Visibility/Graphic Overrides of an Element	6-24
Visibility/Graphic Overrides of an Element Category	6-25
Making Elements Transparent	6-26
Using the Temporary Hide/Isolate Tool	6-26
Plan Views	6-28
Elevation Views	6-29
Section Views	6-32
Using the Scope Box Tool	6-36
Tutorial 1 - Apartment 1	6-38
Tutorial 2 - Club	6-47
Self-Evaluation Test	6-53
Review Questions	6-54
Exercise 1 - Apartment 2	6-55
Exercise 2 - Elevator and Stair Lobby	6-56

## Chapter 7: Using Basic Building Components-II

Creating Floors	7-2
Sketching the Floor Boundary	7-4
Creating Roofs	7-6
Creating the Roof by Footprint	7-6
Creating Roofs By Extrusion	7-9
Modifying Roof Properties and Editing Shapes	7-12
Shape Editing Tools for Structural Floor, Floors, and Roofs	7-16

Modify Sub Elements	7-16
Add Points	7-18
Draw Split Lines	7-18
Pick Supports	7-18
Reset Shape	7-18
Creating Ceilings	7-19
Creating an Automatic Ceiling	7-19
Sketching a Ceiling	7-19
Using the Pick Walls Method	7-21
Modifying a Ceiling	7-21
Rooms	7-22
Adding Rooms	7-22
Calculating Room Volumes	7-27
Cutting Openings in the Wall, Floor, Roof and Ceiling	7-27
Joining Walls with Other Elements	7-30
Using the Attach Top/Base and Detach Top/ Base Tools	7-30
Tutorial 1 - Apartment 1	7-31
Tutorial 2 - Club	7-35
Self-Evaluation Test	7-43
Review Questions	7-44
Exercise 1 - Apartment 2	7-45
Exercise 2 - Elevator and Stair Lobby	7-45

## Chapter 8: Using Basic Building Components-III

Using Components in a Project	8-2
Adding Components	8-2
Using Stairs in a Project	8-6
Adding Stairs	8-6
Modifying Stairs Properties	8-6
Creating Stairs by Sketching Runs	8-8
Creating Stairs by Sketching the Boundary and Riser Lines	8-9
Using Railings in a Building Model	8-12
Creating Railings	8-13
Modifying Railing Properties	8-14
Creating Ramps	8-15
Using Curtain Systems in a Project	8-17
Creating a Curtain Wall Using the Wall Tool	8-18
Creating a Curtain Wall by Picking Lines	8-19
Creating a Curtain System on a Face	8-19
Adding Curtain Grids	8-20
Modifying Curtain System Panels	8-22
Adding Doors and Awnings to a Curtain System	8-22
Adding Mullions	8-23
Copying Elements from One Level to Another	8-23

Using the Pasting Tools	8-24
Tutorial 1 - Apartment 1	8-25
Tutorial 2 - Club	8-31
Tutorial 3 - Elevator and Stair Lobby	8-34
Self-Evaluation Test	8-42
Review Questions	8-42
Exercise 1 - Apartment 2	8-43

## Chapter 9: Adding Site Features

Working with Site Features	9-2
Creating a Toposurface	9-3
Creating Toposurface Subregions	9-5
Splitting a Toposurface	9-6
Merging Toposurfaces	9-6
Creating a Toposurface Using the Imported Data	9-7
Setting the Site Properties	9-9
Adding Property Lines	9-10
Sketching Property Lines	9-10
Creating Property Lines Using Distances and Bearings	9-11
Creating Building Pads	9-13
Adding Site Components	9-15
Adding Parking Components	9-17
Adding Labels to Contours	9-17
Tutorial 1 - Site Plan	9-18
Self-Evaluation Test	9-34
Review Questions	9-35
Exercise 1 - Site Plan	9-36
Exercise 2 - Museum Site Plan	9-37

## Chapter 10: Using Massing Tools

Understanding Massing Concepts	10-2
Creating the Massing Geometry	10-3
Creating a Massing Geometry in the Family Editor	10-4
Editing Massing Geometry in the Family Editor	10-10
Creating Cuts in a Massing Geometry Using the Family Editor	10-12
Placing the Massing Geometry in a Project	10-14
Creating the In-Place Mass in a Project	10-14
Creating Building Elements from the Massing Geometry Using the Building Maker Tools	10-15
Creating Walls by Selecting Faces	10-15
Creating Floors by Selecting Faces	10-16
Creating Roofs by Selecting Faces	10-17
Creating Curtain Systems by Selecting Faces	10-17
Controlling the Visibility of a Massing Geometry	10-18
Adding other Building Elements	10-19

Creating Families	10-19
Creating In-Place Families	10-21
Creating Families Using Standard Family Templates	10-21
Tutorial 1 - Office Building 2	10-30
Self-Evaluation Test	10-46
Review Questions	10-46
Exercise 1 - Office Towers	10-47
Exercise 2 - Stadium	10-48

Chapter 11: Adding Annotations and Dimensions

Adding Tags	Enhanced	11-2
Tagging Elements by Category		11-3
Tagging All Elements in a View		11-6
Room Tags		11-8
Room Separation		11-8
Tagging Rooms		11-9
Keynotes		11-11
Loading Keynote File		11-12
Placing Keynotes		11-13
Keynote Legends		11-15
Adding Symbols		11-15
Adding Dimensions		11-16
Types of Dimensions		11-17
Dimensioning Terminology		11-19
Adding Permanent Dimensions		11-20
Baseline and Ordinate Dimensions		11-23
Editing Dimensions		11-25
Controlling the Display of Tick Mark and Dimension Arrow		11-26
Creating Linear Wall Dimensions Automatically		11-27
Adding Spot Dimensions		11-28
Placing a Spot Dimension		11-28
Modifying Spot Dimension Properties		11-29
Converting Temporary Dimensions to Permanent Dimensions		11-29
Tutorial 1 - Apartment 1		11-31
Self-Evaluation Test		11-41
Review Questions		11-41
Exercise 1 - Club		11-42
Exercise 2 - Elevator and Stair Lobby		11-43
Exercise 3 - Building 1		11-43

Chapter 12: Creating Project Details and Schedules

Project Detailing in Autodesk Revit Architecture	12-2
Creating Details Using a Building Model	12-2
Creating a Callout View	12-3
Displaying the Callout View	12-3



Modifying Callout View Properties	12-4
Adding Details in the Callout View	12-5
Crop Regions	12-7
Model Crop Region	12-7
Annotation Crop Region	12-7
Creating Drafted Details	12-12
Creating a Drafting View	12-12
Drafting a Detail	12-13
Line Style Settings	12-13
Using Line Weights	12-15
Using Line Patterns	12-16
Adding Text Notes	12-16
Creating Text Notes	12-17
Editing Text Notes	12-18
Creating a Model Text	12-20
Revision Clouds	12-22
Creating the Revision Cloud	12-22
Adding a Revision Tag	12-23
Using Schedules in a Project	12-25
Generating a Schedule	12-25
Creating a Legend View	12-29
Tutorial 1 - Apartment 1 - Callout View	12-30
Tutorial 2 - Apartment 1 - Schedules	12-41
Tutorial 3 - Road Section Detail	12-45
Self-Evaluation Test	12-51
Review Questions	12-51
Exercise 1 - Club - Drafted Detail	12-52
Exercise 2 - General- Sketch Detail	12-53
Exercise 3 - Club - Schedules	12-53

## Chapter 13: Creating Drawing Sheets and Plotting

Creating Drawing Sheets	13-2
Adding a Drawing Sheet to a Project	13-2
Adding Views to a Drawing Sheet	13-4
Modifying the View Properties	13-5
Panning the Viewports Added in the Sheet	13-7
Adding Schedules to a Drawing Sheet	13-7
Modifying a Building Model in a Drawing Sheet	13-9
Duplicate Dependent Views	13-10
Creating Dependent Views	13-10
Adding Matchline to Dependent Views	13-11
Printing in Autodesk Revit Architecture	13-13
Printing Drawing Sheets and Project Views	13-13
Selecting and Modifying the Printer Settings	13-13
Using the Print Setup Dialog Box	13-16
Previewing the Print Setup	13-18

Tutorial 1 - Apartment 1	13-19
Self-Evaluation Test	13-24
Review Questions	13-24
Exercise 1 - Club	13-25
Exercise 2 - Urban House	13-25

### Chapter 14: Creating 3D Views

Three-Dimensional (3D) Views	14-2
Creating Orthographic Views	14-3
Dynamically Viewing Models Using the Navigation Tools	14-4
Using the Orient Tool	14-10
Generating the Perspective Views	14-12
Using the Section Box	14-17
Tutorial 1- Apartment 1	14-18
Tutorial 2- Club	14-23
Self-Evaluation Test	14-28
Review Questions	14-29
Exercise 1 - Apartment 1	14-31
Exercise 2 - Office Building 2	14-31
Exercise 3 - Office Building 3	14-32

### Chapter 15: Rendering Views and Creating Walkthroughs

Rendering in Revit Architecture	15-2
Rendering Workflow	15-2
Introduction to Materials	15-5
Assigning Materials by Using the Materials Dialog Box	15-5
Applying Lights	15-14
Using Decals and Entourages	15-16
Rendering Settings	15-19
Creating a Walkthrough	15-24
Creating the Walkthrough Path	15-24
Editing and Playing the Walkthrough	15-25
Recording a Walkthrough	15-29
Tutorial 1 - Apartment 1	15-30
Tutorial 2 - Office Building 2	15-45
Self-Evaluation Test	15-50
Review Questions	15-51
Exercise 1 - Club	15-52
Exercise 2 - Apartment 1 - Night View	15-52

### Chapter 16: Using Advanced Features

Creating Structural Components	16-2
Creating Structural Walls	16-3
Creating Structural Columns	16-5

Adding Structural Beams and Braces	16-7
Cutting Openings in Beams, Braces, and Columns	16-8
Generating Multiple Design Options	16-9
Generating Design Options for a Project	16-10
Presenting Design Options	16-10
Using Area Analysis Tools	16-11
Area Schemes	16-12
Area Plans	16-13
Area Schedules	16-15
Color Schemes	16-15
Creating Color Schemes	16-16
Masking Regions	16-21
Adding Masking Regions to a Project	16-21
Adding Masking Regions to a Model Family	16-22
Using Project Phasing Tools	16-23
Understanding Phasing Concepts	16-23
Linking Building Models and Sharing Coordinates	16-25
Linking or Importing Models	16-25
Linking Revit Models	16-28
Nested Linked Models	16-29
Converting Linked Models to Groups - Binding Links	16-30
Managing Links	16-33
Including Elements of Linked Models in Schedules	16-33
Applying the Color Schemes of the Host Model to Rooms and Areas of the Linked Models	16-34
Copying Linked Model Elements	16-35
Worksharing Concepts	16-35
Worksharing Using Workset Tools	16-35
Process of Worksharing	16-36
Saving Methodology in Worksharing	16-41
Element Ownership Concepts	16-42
Purging Unused Element families	16-43
Transferring Project Standards	16-43
Organizing the Project Browser	16-43
Generating Shadows	16-44
Revit Architecture Solar Studies	16-44
Generating Still Solar Study	16-45
Creating an Animated Solar Study	16-47
Revit Architecture Interoperability	16-50
Interoperability with Autodesk 3ds Max and Autodesk 3ds Max Design	16-51
Interoperability with Google SketchUp	16-52
Publishing Tips in Autodesk Revit Architecture 2011	16-54
Tutorial 1 - Apartment 1	16-54
Tutorial 2 - Apartment Complex	16-65

Self-Evaluation Test	16-74
Review Questions	16-75
Exercise 1 - Apartment 2	16-76
Exercise 2 - Apartment Complex	16-78

<b>Index</b>	<b>1</b>
--------------	----------