



Image courtesy of Cannon Design

Introduction

Welcome to the *Architecture / Visualization Industry Standards (AVIS) for Autodesk® Revit Architecture*. Autodesk provides this document to help instructors and educational institutions develop the necessary skills to teach Revit Architecture and prepare their learners for the challenges of working in industry. This document is the result of extensive interviews with professionals, educators, and managers at prestigious production companies around the world. The *Architecture / Visualization Industry Standards (AVIS)* ultimately provide clear benchmarks and definitions for instructing with Revit Architecture.



TIP: Although this document is designed to help facilitate the development of instructor-led courses and lessons, it may also be referenced for self-paced learning by instructors. The Standards encourage self-learning through the use of the Revit Architecture documentation and online help.

This introduction covers the following topics:

- Document Goals
- Document Objectives
- Prerequisites
- Using this Document
- Notes, Tips, Warnings, and Thoughts
- Feedback

Document Goals

The *Architecture / Visualization Industry Standards (AVIS)* have the following goals:

- Ensure learners receive comprehensive instruction of Revit Architecture, with a focus on its role and function in the architecture, engineering, and construction (AEC) industry.
- Standardize the requirements and/or core competencies for fundamental and intermediate level instruction with Revit Architecture.
- Provide a clear benchmark on the type and level of content that should be taught to new learners of Revit Architecture.
- Provide a content framework for developing high-quality curriculum, courseware, and lessons involving Revit Architecture.
- Provide a content framework and reference guide for the Autodesk® Certified Instructor (ACI) program.

Document Objectives

After reviewing this document, you will be able to:

- Explain the purpose of the *Architecture | Visualization Industry Standards (AVIS)*.
- Identify the structure and features of the *Architecture | Visualization Industry Standards (AVIS)*.
- Distinguish and organize instructional content typically associated with Revit Architecture into four primary areas.
- Explain how to develop instructor-led lessons by referencing the *Architecture | Visualization Industry Standards (AVIS)*, indicating features in the document that will enable the collection of additional information around a particular subject.

Introduction

Prerequisites

The *Architecture / Visualization Industry Standards (AVIS)* are designed for instructors who desire fast and efficient access to the essential principles of computer graphics theory, practice, and software technology typically associated with learning Revit Architecture.

It is recommended that you have:

- A comprehensive understanding of architecture, engineering, and construction (AEC) theory and practice.
- A good understanding of adult learning principles and instructional methodologies.
- A robust working knowledge of Autodesk® Revit Architecture.

Using This Document

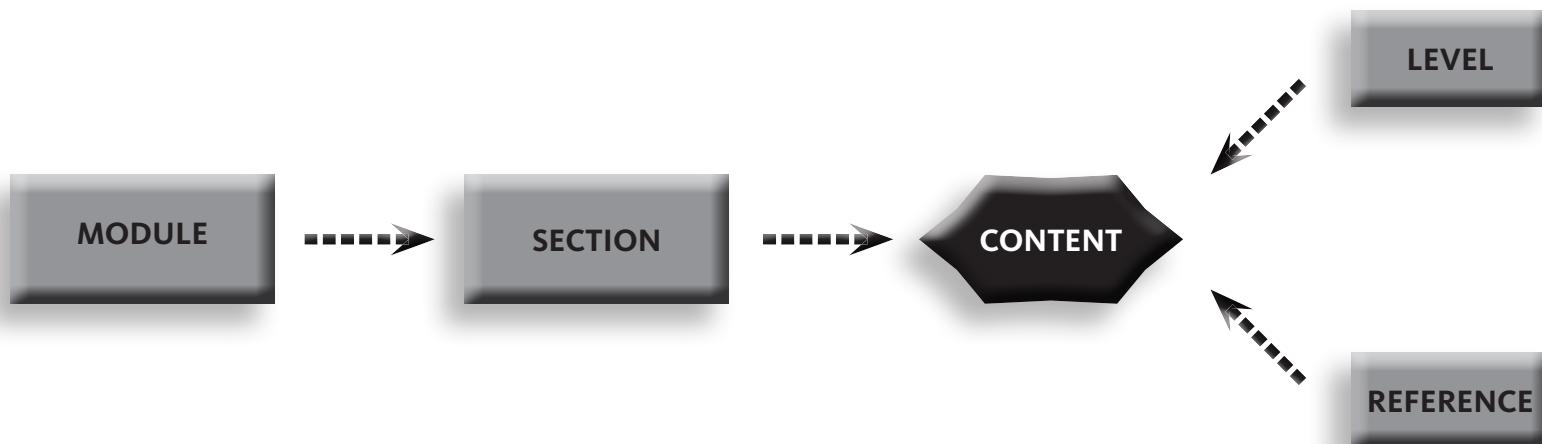
This section will provide an overview of the *Architecture / Visualization Industry Standards (AVIS)*.



THOUGHT: The Autodesk® Certified Instructor (ACI) program includes online and live courses designed to help instructors learn how to best utilize the *Architecture / Visualization Industry Standards (AVIS)*. For information on the program, visit: <http://www.autodesk.com/aci>. Using instructional tools like the *Architecture / Visualization Industry Standards (AVIS)*, instructors will be able to develop the most compelling learning content and provide the most effective instruction.

The *Architecture / Visualization Industry Standards (AVIS)* employs a hierarchical structure. This design is intended to provide organization and clarity around content (i.e. information) that can be perceived as highly complex or confusing to the AEC community. It is also meant to ensure instructors have the means to reference the document and get the information they need in the most efficient and productive manner

The structure of the *Architecture / Visualization Industry Standards (AVIS)* includes a 3-tier hierarchy



Architectural | Visualization Industry Standards



THOUGHT: The structure of the *Industry Standards (IS)* is identical for all document sets. This is strategically designed to promote cross-learning quickly and efficiently so instructors may increase their technical skills and abilities with Autodesk software.

MODULES

The *Architecture / Visualization Industry Standards (AVIS)* is divided into 5 MODULES. Each MODULE relates to a standard, functional subject area or feature-set available in Autodesk® Revit Architecture. Several of the MODULES can be loosely associated to a standardized discipline or career path available in architecture, engineering, and construction (AEC) industry.

The MODULES are listed below in alphabetical order:

1. Construction Documents
2. Design/Conceptual
3. Design/Development
4. Project Management
5. Visualization

Each MODULE in the *Architecture / Visualization Industry Standards (AVIS)* is divided into 4 SECTIONS:

1. Theory. This SECTION provides content that is conceptual or theoretical in nature. Historical/background information on a MODULE is also identified in this SECTION.
2. Applied. This SECTION provides content that is practical in nature (i.e. how the information or the software technology is typically applied in industry. Workflow and techniques that utilize the software technology are identified in this SECTION).
3. Activity. This SECTION provides recommended activities/exercises that instructors can offer to their learners. Adults typically learn the most knowledge and retain the most skills by ‘doing things’, so this SECTION is perhaps the most important asset for the instructor.
4. Tools. This section provides content relating directly to the features, toolsets, options, and commands available in Autodesk® Revit Architecture®.



THOUGHT: It is up to the creativity of the instructor to create and provide the most stimulating and engaging ACTIVITIES. If you would like to share your ACTIVITY recommendations with Autodesk, please send correspondence to: me.certification@autodesk.com. Your contributions are welcomed and may be listed in future releases of this document!

Introduction



WARNING: The content in the *Architecture | Visualization Industry Standards (AVIS)* is not listed in chronological order! Any instances of this are coincidental and should be evaluated by the individual.

SECTIONS

Each SECTION in the *Architecture | Visualization Industry Standards (AVIS)* contains many rows of content. Each row of content has designations for LEVELS and connections to REFERENCES. The following section will explain the concept of LEVELS and REFERENCES.

LEVELS

All content in the *Architecture | Visualization Industry Standards (AVIS)* has a LEVEL designation. The two LEVEL designations are Fundamental and Intermediate. Advanced LEVEL content is out of the scope of the documents.



NOTE: Teaching at a particular LEVEL does not establish the instructor's comprehension or skills with Revit Architecture. An instructor's interest in teaching at the fundamental LEVEL courses does not typically mean their knowledge is limited to a fundamental LEVEL. In fact, most instructors teaching at the fundamental level are accomplished Revit Architecture users.

The concept of the LEVEL designation is important for two reasons. First, the LEVEL attempts to highlight the amount of difficulty that most beginner computer graphics learners may have when attempting to absorb a particular piece of information. In this manner, it should be assumed that Fundamental LEVEL content should be taught before Intermediate LEVEL content. Second, the LEVEL attempts to distinguish content that is Fundamental LEVEL or Intermediate LEVEL from content that could be considered Advanced LEVEL. In this manner, it should be assumed that Advanced LEVEL content would directly follow Intermediate LEVEL content.

The most important point to remember when considering the LEVEL of any piece of information is how it could be perceived to the learner. Instructors need to remember that most subjects in the computer graphics field include information that could easily be perceived as Advanced LEVEL to learners that were not previously exposed to Fundamental or Intermediate LEVEL content around the same subject.



WARNING: In practice, LEVEL of content is highly subjective to the individual instructor and learner. The content one instructor identifies as Fundamental LEVEL may be Intermediate LEVEL content to another. Similarly, the LEVEL of difficulty learners have with any particular subject can be directly associated to their experience, knowledge, skills, and interests around the subject. Instructors must recognize this and act accordingly!

Introduction

REFERENCES

The *Architecture | Visualization Industry Standards (AVIS)* contain two different kinds of REFERENCES.

1. (External Content) REFERENCES. This type of REFERENCE identifies content around the subject that is readily available through the internet. These REFERENCES are indicated in the Theory, Applied, and Activity SECTIONS of the *Architecture | Visualization Industry Standards (AVIS)*. Instructors should evaluate the appropriateness of the content available through this REFERENCE when designing instructor-led courses and lessons.



TIP: Every effort has been made to ensure each link is associated with live content. If you experience difficult using the links, please use the text in the link to search for this content on the internet. The internet contains a wealth of information on each subject listed in the content section of this document.



WARNING: The REFERENCES provided in the *Architecture | Visualization Industry Standards (AVIS)* are not a complete collection of links around a subject. If you identify a better link, please use it! If you would like to share it, please send correspondence to: me.certification@autodesk.com. Your contributions are welcomed and may be listed in future releases of this document!

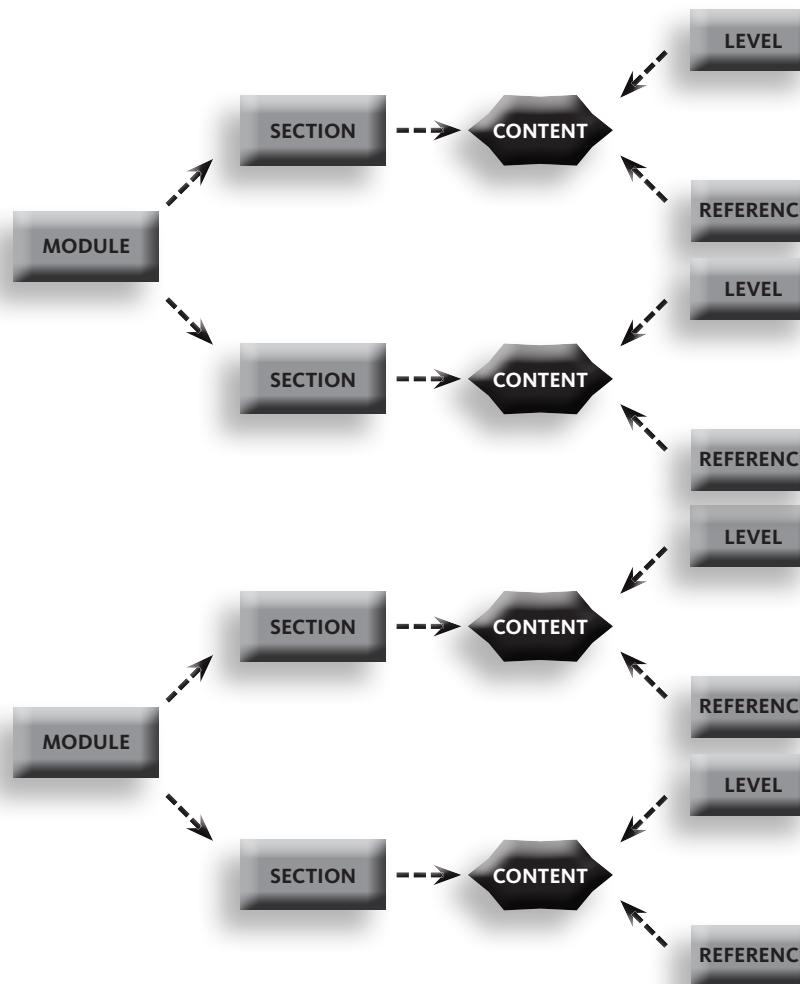
2. (Software Documentation and Online Help) REFERENCES. This type of REFERENCE indicates the string of text that can be entered into the search field of the software documentation and online help system in order to receive more information around a subject. These REFERENCES are indicated in the Tools SECTION of the *Architecture | Visualization Industry Standards (AVIS)*. Instructors should evaluate the appropriateness of the content available through this REFERENCE when designing instructor-led courses and lessons.



NOTE: This document is complementary to the software documentation and online help. For detailed explanations of specific software features and functionality, refer to the documentation and online help system in the software. You may also reference the software documentation and online help that is available on Autodesk.com.

Introduction

The following graphic provides a more detailed illustration of the structure of the *Architecture / Visualization Industry Standards (AVIS)*:



NOTE: The amount of content listed in each **MODULE** may vary according to several factors, including the relevance of the content, the variety of content available in the respective **SECTION**, and the difficulty that learners (at a particular **LEVEL**) may have in learning the content. For example, one **MODULE** may be extensive at the Fundamental **LEVEL**, while another **MODULE** may be more technically challenging and is therefore more limited at the Fundamental **LEVEL**. Similarly, one **MODULE** may be heavy in Theory, while another **MODULE** is sparse.



Introduction

Notes, Tips, Warnings, and Thoughts

Throughout this document, notes, tips, warnings, and thoughts are called out for special attention. Notes contain guidelines, constraints, and other explanatory information. Tips provide information to enhance your productivity. Warnings provide information about actions that might result in confusion experienced by yourself or your learners. Thoughts contain additional information that you may want to reflect upon or take further action.

Feedback

Autodesk welcomes feedback on the *Architecture / Visualization Industry Standards (AVIS)*. After reviewing this document, if you have suggestions for improvements, or if you want to report an error, please send your feedback to: me.certification@autodesk.com.



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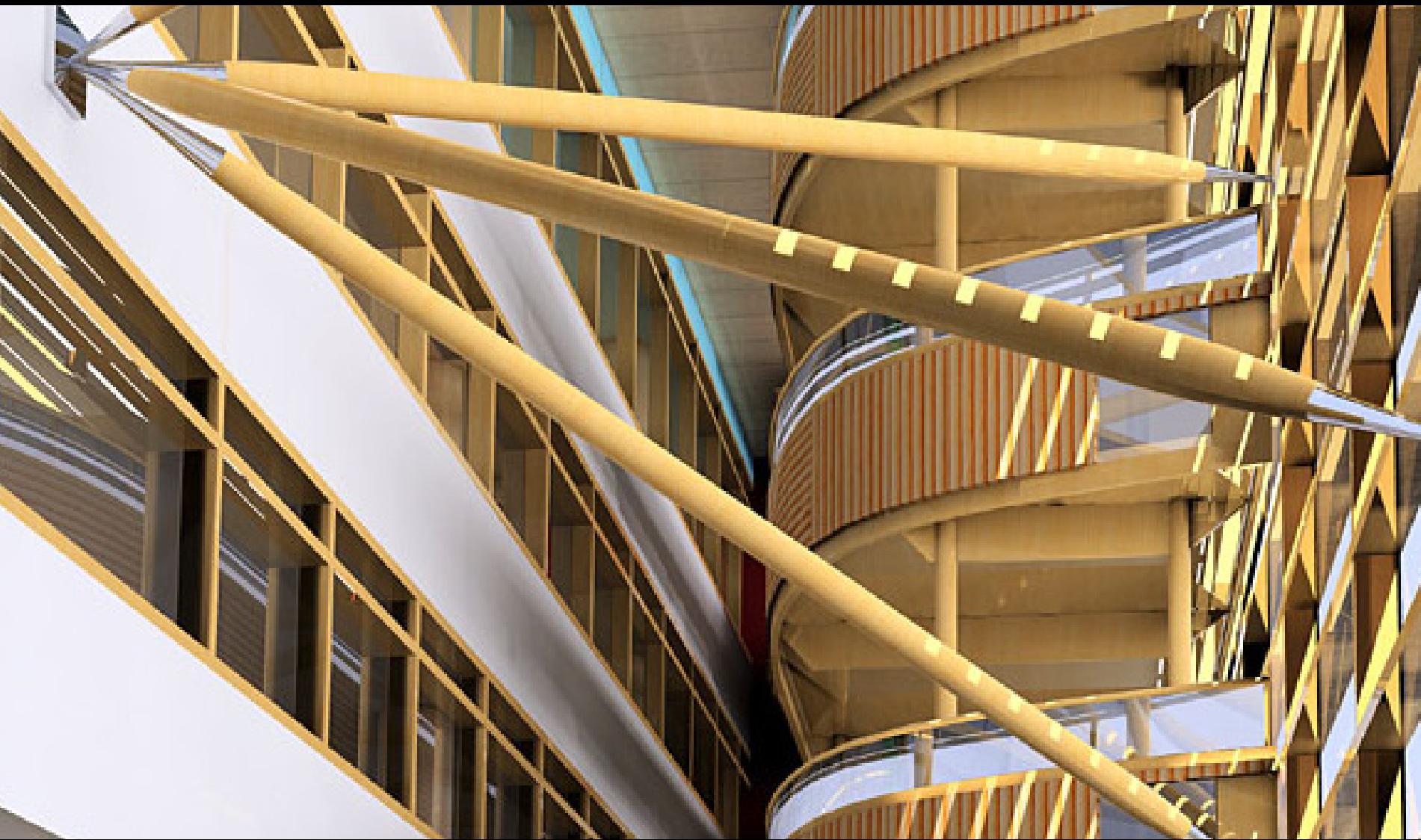


Image courtesy of Chen3d

Construction Documents

Construction Documents | Theory

Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
Drawing Basics	Projects	Explain the purpose and benefits of Projects (e.g. identification of key coordinated information, etc.).	Understanding Revit Terms (Project)	Fundamental
	Drawing Sets	Explain the purpose and benefits of using Drawing Sets.	Construction Documents Overview	Fundamental
	Construction Detailing	Identify and differentiate the use of plans, elevations, sections, details, and schedules within a Drawing Set for contract documents.	Preparing Construction Documents	Fundamental
	Annotating	Identify and differentiate the use of annotations, tags, dimensions and callouts.	Annotating	Fundamental

Construction Documents | Applied

Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
Drawing Sheets	Sheet Sizes and Scales	Identify standard Sheet Sizes and required Scales for architectural views	Sheets	Fundamental
	Title Blocks	Identify the information used in Title Blocks and define how it coordinates the drawing sheets in a set.	Title Blocks	Fundamental
	Sheet Division	Differentiate best practices for organizing the information and views on a drawing sheet.	Dividing a View Across Multiple Sheets	Fundamental
	Sheet Sets	Analyze the organization and sequencing of the document set.	Digital Cartoon Sets	Fundamental
	Printing	Differentiate the printing of individual sheets, full sheet sets and printing to electronic formats. Identify common electronic formats.	Printing Views and Sheets	Fundamental
Construction Detailing	Construction Detailing	Interpret and discriminate the necessary level of detail for the purposes of communicating construction intent and contract documentation.	Detailing	Fundamental
Annotated Views	Presentation Views	Identify and categorize the use and creation of views to convey information outside of construction details.	Document the Project	Fundamental
	Construction Views	Describe and categorize the required annotation of construction drawings to define design intent.	Annotating	Fundamental



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Construction Documents | Activity

Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
The Drawing Sheet	Project Information	Define, create, and set the Project.	Creating a Project	Fundamental
	Sheet Organization	Organize and categorize plans, elevations, sections, details, and schedules within a plan set for contract documents.	Sheets	Fundamental
Sheet Sets	Sheet Set Organization	Classify practical examples of sheet sets and evaluate them based on organization and content.	Digital Cartoon Sets	Fundamental
Details	Construction Detailing	Identify common detail types and categorize their purpose in the drawing set.	Detailing Overview	Fundamental
	Construction Detailing	Create construction and section details in a set; demonstrate coordination of details with other drawings in the set.	Detailing	Fundamental
	Views	Give examples of construction and presentation views and explain their differences.	Document the Project	Fundamental
Annotated Views	Annotated Views	Categorize the use of various annotated views including the use of tags, dimensions and callouts.	Annotating	Fundamental



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Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
Printing	Overview	Summarize the printing process.	Print	Fundamental
	Print Setup	Analyze the different options and settings involved with Printing.	Print Setup	Fundamental
	Print Preview	Describe how the Print Preview tool can help save time by catching errors before printing.	Print Preview	Fundamental
	Printing Views and Sheets	Differentiate the options and settings involved with Printing.	Printing Views and Sheets	Fundamental
	Selecting Views to Print	Demonstrate how to specify which views and sheets are to be included.	Selecting Views to Print	Fundamental
	Printing to PDF	Demonstrate how to specify which views and sheets are to be included.	Printing to PDF	Fundamental
	Batch Printing	Demonstrate how Batch Printing provides an easy way to print a large number of drawings.	Batch Printing	Fundamental
Publishing	Autodesk® Seek	Summarize how to publish families, products, or design information.	Publishing to Autodesk® Seek	Fundamental
	Buzzsaw	Summarize the use of Buzzsaw for the storage, management, and distribution of project documents.	Publishing to Buzzsaw	Fundamental

Design / Conceptual

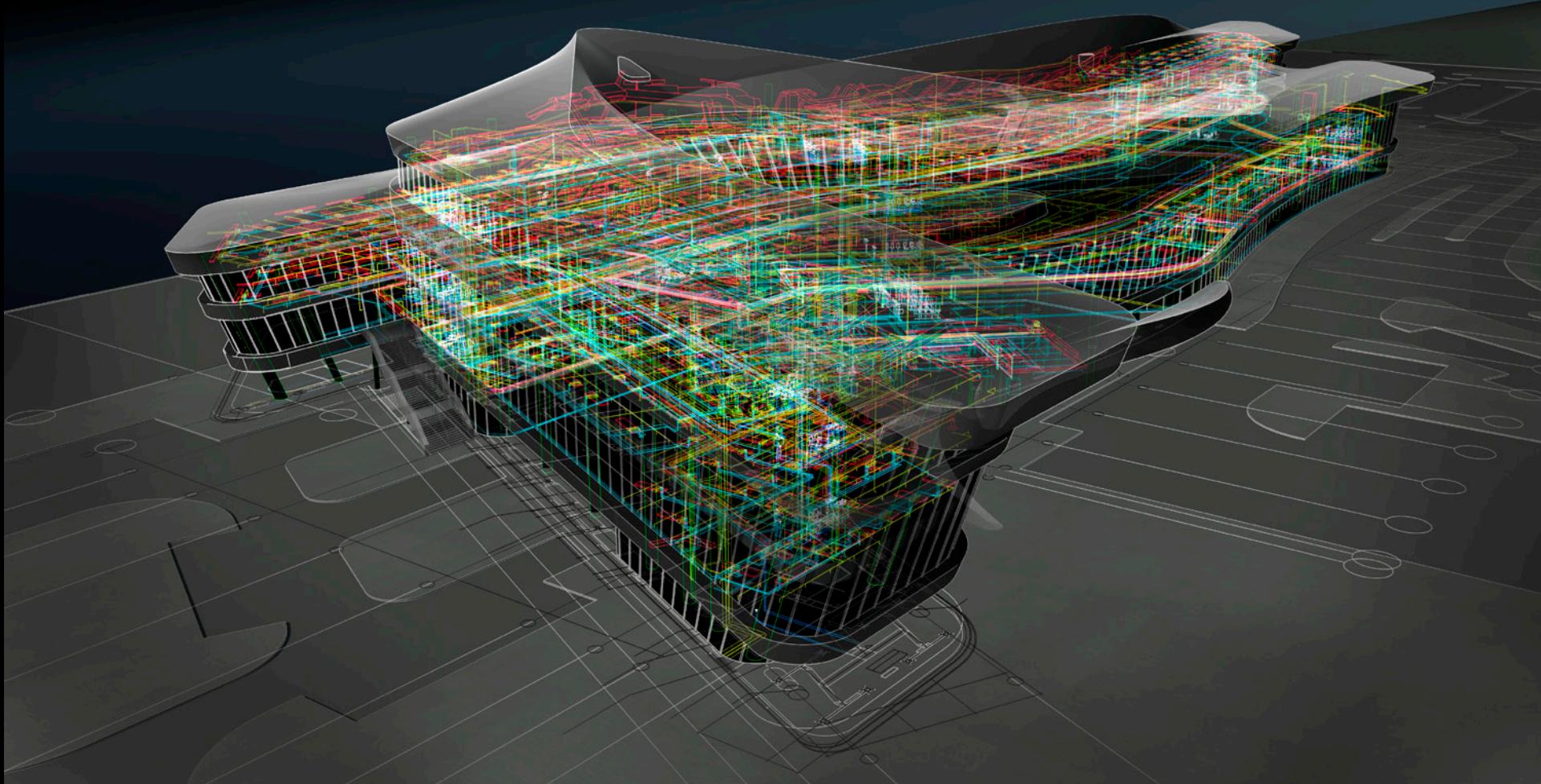


Image courtesy of CCDI Group

Design / Conceptual | Theory

Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
Conceptual Modeling	Conceptual Design	Describe the techniques used in the creation and presentation of mass models in initial design development.	Massing Studies Overview	Fundamental

Design / Conceptual | Applied

Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
Conceptual Design	Proportion	Demonstrate the concepts of Proportion and scale and their effect on the conceptual design.	Proportion	Fundamental
Conceptual Design	Site Analysis	Describe the effects of the building site on conceptual design including building orientation, surrounding structures, and the environment.	Site Design	Fundamental



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Design / Conceptual | Activity

Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
Design Development	Zoning Envelope	Document the process of refining the concept model to further develop the building enclosure in form and material.	Zoning Envelope	Fundamental
Design Development	Space Planning	Summarize the development of the floor plan, including the allocation of spaces, infrastructure, and the relationships between types of spaces and functions.	Analyzing a Conceptual Design	Fundamental
Design Development	Site Development	Explain the relationship between the design and its surrounding including access, visibility, and building orientation.	Site Design	Fundamental
Construction Modeling	Contract Documentation	Describe the refinement of a design model into a model that details the construction of the components, the physical dimensioning of the design, and specification of materials.	Document the Project	Fundamental
Construction Modeling	Construction Coordination	Classify the use of the model in defining sequence of construction, construction validation, and coordination of disciplines.	Collaborate with Others	Fundamental



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Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
Massing	Overview	Describe the concepts and basic terms of massing.	Massing Studies	Fundamental
	Terminology	Identify common terminology.	Massing Studies Terminology	Fundamental
	Creating a Mass Family	Demonstrate the creation and editing of a Mass Family.	Creating a Mass Family	Fundamental
	Creating Building Elements from Mass Instances	Demonstrate the modeling of a building abstractly including the creation of elements from mass Instances.	Creating Building Elements from Mass Instances	Fundamental
Conceptual Design Environment	Overview	Describe the CDE and typical uses.	Conceptual Design Environment Overview	Fundamental
	Interface	Identify common tools in the CDE interface.	Conceptual Design Environment Interface	Fundamental
	Switching between Conceptual Design and Project Environments	Demonstrate switching between Conceptual Design and Project Environments.	Switching between Conceptual Design and Project Environments	Fundamental
	Forms	Identify and categorize the different types of Forms and demonstrate their use.	Forms	Fundamental
	Drawing in the Conceptual Design Environment	Demonstrate the different elements that can be drawn in the CDE.	Drawing in the Conceptual Design Environment	Fundamental
	X-Ray Mode	Demonstrate the use of X-Ray mode for direct interaction with individual elements.	X-Ray Mode	Fundamental
	Profiles	Create a Profile and generate a form using the Profile.	Profiles	Fundamental
	Rationalizing Surfaces	Convert a surface into a parametric building component by rationalizing it; verify the parametric capability of the new component.	Rationalizing Surfaces	Fundamental

Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
Toposurfaces	Creating a Toposurface by Picking Points	Create a Toposurface by selecting points.	Creating a Toposurface by Picking Points	Fundamental
	Creating a Toposurface from Imported 3D Data	Create a Toposurface by importing 3D data.	Creating a Toposurface from Imported 3D Data	Fundamental
	Creating a Toposurface from a Points File	Create a Toposurface from a Points file.	Creating a Toposurface from a Points File	Fundamental
	Simplifying a Toposurface	Illustrate how simplifying a Toposurface can improve system performance.	Simplifying a Toposurface	Fundamental
	Toposurface Subregions	Define Toposurface Subregions and identify different sets of properties.	Toposurface Subregions	Fundamental
	Splitting a Toposurface	Demonstrate how to Split a Toposurface.	Splitting a Toposurface	Fundamental
	Merging Toposurfaces	Demonstrate how to Merge a Toposurface.	Merging Toposurfaces	Fundamental
	Graded Regions	Create and Edit Graded Regions.	Graded Regions	Fundamental



Image courtesy of Teapot Creation

Design / Development

Design / Development | Theory

Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
Design Modeling	Design Development	Explain the transference of conceptual models and designs into the Design Development phase and compare the differences in the level of detail and modeling.	Architectural Modeling	Fundamental
Construction Modeling	Construction Model	Describe the extraction of components from the design model and illustrate their embellishment to create the Construction Model.	Structural Modeling	Fundamental

Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
Design Development	Zoning Envelope	Document the process of refining the concept model to further develop the building enclosure in form and material.	Zoning Envelope	Fundamental
	Space Planning	Summarize the development of the floor plan, including the allocation of spaces, infrastructure, and the relationships between types of spaces and functions.	Analyzing a Conceptual Design	Fundamental
	Site Development	Explain the relationship between the design and its surrounding including access, visibility, and building orientation.	Site Design	Fundamental
Construction Modeling	Contract Documentation	Describe the refinement of a design model into a model that details the construction of the components, the physical dimensioning of the design, and specification of materials.	Document the Project	Fundamental
	Construction Coordination	Classify the use of the model in defining sequence of construction, construction validation, and coordination of disciplines.	Collaborate with Others	Fundamental



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Design / Development | Activity

Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
Modeling	Building Exteriors	Analyze examples of existing structures to show common design techniques used in defining shapes and materials.	Analyze the Design	Fundamental
	Building Interiors	Describe the effects of space planning and analyze estimated requirements based on industry standards.	Analyze the Design	Fundamental
	Site Analysis	Analyze and interpret examples of site development in a design including controlling traffic flow and creating points of interest.	Analyze the Design	Fundamental
Construction Models	Construction Method	Contrast the requirements of the design model versus the construction model.	Structural Modeling	Fundamental
	Coordination	Demonstrate the collaboration between disciplines such as mechanical, electrical, and plumbing in the modeling process.	Multi-Discipline Coordination	Fundamental
	Phasing	Identify the effects of phasing on a model and how these differ between a design model and a construction model.	Project Phasing	Fundamental



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Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
Editing Elements	Selecting Elements	Demonstrate the selection of elements.	Selecting Elements	Fundamental
	Undoing, Redoing, or Canceling an Action	Demonstrate the use of undoing, redoing, and canceling an action in a typical modeling workflow.	Undoing, Redoing, or Cancelling an Action	Fundamental
	Editing Elements in Groups	Create groups of elements and edit the group properties.	Editing Elements in Groups	Fundamental
	Using Arrays of Elements	Demonstrate the use of arrays of elements.	Using Arrays of Elements	Fundamental
	Moving Elements	Use the Move tool in a typical modeling workflow.	Moving Elements	Fundamental
	Trimming and Extending Elements	Demonstrate Trimming and Extending Elements; analyze the resulting conditions.	Trimming and Extending Elements	Fundamental
	Copying Elements	Demonstrate the copying of elements.	Copying Elements	Fundamental
	Modifying Elements	Modify Elements' properties in a typical workflow.	Modifying Elements	Fundamental
	Deleting Elements	Demonstrate the deletion of elements in a design.	Deleting Elements	Fundamental
Architectural Design Elements	Walls	Demonstrate how to create and modify Wall elements.	Walls	Fundamental
	Roofs	Demonstrate how to create and modify Roof elements.	Roofs	Fundamental
	Floors	Demonstrate how to create and modify Floor elements.	Floors	Fundamental
	Ceilings	Demonstrate how to create and modify Ceiling elements.	Ceilings	Fundamental
	Openings	Demonstrate how to create and modify Opening elements.	Openings	Fundamental
	Stairs	Demonstrate how to create and modify Stair elements.	Stairs	Fundamental
	Ramps	Demonstrate how to create and modify Ramp elements.	Ramps	Fundamental
	Railings	Demonstrate how to create and modify Railing elements.	Railings	Fundamental
	Architectural Columns	Demonstrate how to create and modify Column elements.	Architectural Columns	Fundamental

Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
Architectural Design Elements	Curtain Elements	Demonstrate how to create and modify Curtain elements.	Curtain Elements	Fundamental
	Model Text	Demonstrate how to create and modify Text elements.	Model Text	Fundamental
Hosted Components	Doors	Demonstrate how to create and modify Door elements.	Doors	Fundamental
	Windows	Demonstrate how to create and modify Window elements.	Windows	Fundamental
	Model Lines	Demonstrate how to create and modify Line elements.	Model Lines	Fundamental
	Components	Demonstrate how to create and modify Component elements.	Components	Fundamental
Creating and Modifying Lighting Fixtures	Creating and Modifying Lighting Fixtures	Identify lighting fixtures by Revit Family.	Creating and Modifying Lighting Fixtures	Fundamental
	Creating Lighting Fixtures with Multiple Light Sources	Create a light fixture with multiple light sources.	Creating a Lighting Fixture with One Light Source	Fundamental
	Specifying an IES File for a Light Source	Select an IES file for a lighting source; describe how this can provide more photorealistic lighting effects.	Specifying an IES File for a Light Source	Fundamental
	Defining a Light Source	Define a Light Source in a light fixture.	Defining a Light Source	Fundamental
	Parameters for Lighting Fixtures and Light Sources	Identify common parameters used to adjust Lighting Fixtures and Light Sources.	Defining Parameters for Lighting Fixtures and Light Sources	Fundamental
Using Lighting Fixtures in a Building Model	Turning Lights On and Off	Demonstrate how to turn lights on and off.	Turning Lights On and Off	Fundamental
	Adding a Lighting Fixture to a Building Model	Insert and place a Lighting Fixture in a Building Model.	Adding a Lighting Fixture to a Building Model	Fundamental
	Displaying a Wall-Based Lighting Fixture in a Floor Plan	Demonstrate the display of a Lighting Fixture in a Floor Plan.	Displaying a Wall-Based Lighting Fixture in a Floor Plan	Fundamental
	Changing a Lighting Fixture in a Building Model	Modify a Lighting Fixture in a Building Model.	Changing a Lighting Fixture in a Building Model	Fundamental
	Displaying Light Sources in a View	Manipulate the display mode to display Light Sources in a view.	Displaying Light Sources in a View	Fundamental

Design / Development | Tools

Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
Using Lighting Fixtures in a Building Model	Aiming a Spotlight	Manipulate a Spotlight by aiming it at a target.	Aiming a Spotlight	Fundamental
	Controlling the Brightness of a Light Source	Modify the Brightness of a Light Source.	Controlling the Brightness of a Light Source	Fundamental

Project Management



Image courtesy of Chen3d

Project Management | Theory

Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
BIM	Introduction	Explain the term: Building Information Modeling (BIM).	Building Information Modeling	Fundamental
	Project Phases	Define the phases of a building project.	BIM Curriculum: Unit 1 - Overview	Fundamental
IPD	Introduction	Explain the term: Integrated Project Delivery (IPD).	Integrated Project Delivery	Fundamental
	Project Coordination	Diagram the process of working within a project team.	BIM Curriculum: Unit 5 - Lesson 1	Fundamental

Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
Design Process	Conceptual	Diagram the Conceptual design process.	Building Information Modeling	Fundamental
	Schematic	Diagram the Schematic design process.		Fundamental
	Design Development	Diagram the Design Development process.		Fundamental
	Construction Documentation	Diagram the Construction Documentation process.		Fundamental
	Bid Negotiation	Diagram the procurement process.		Fundamental
	Construction Administration	Illustrate the process of administering construction.		Fundamental
	Building Lifecycle	Describe the Building Lifecycle.		Fundamental
Coordination	Owner Team	Describe the role of the owner in the design and coordination process.	Integrated Project Delivery	Fundamental
	Design Team	Describe the role of the Design Team in the design and construction process.		Fundamental
	Construction Team	Describe the role of the Construction Team in design and construction process.		Fundamental



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Project Management | Activity

Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
Design Process	Design Process	Describe and categorize the design process as identified in a real world project, correlating the design phases to the specific tasks in the project.	Building Information Modeling	Fundamental
	Project Responsibility	List the various organizations involved in an architectural design project and describe their influence or control of the process.	Integrated Project Delivery	Fundamental



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Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
User Interface	Application Menu	Identify items on the application menu.	Application Menu	Fundamental
	Drawing Area	Identify and configure the drawing area.	Drawing Area	Fundamental
	Options Bar	Define available options on the Options Bar.	Options Bar	Fundamental
	Project Browser	Demonstrate setting projects using the Project Browser.	Project Browser	Fundamental
	Quick Access Toolbar	Demonstrate file access and configuration using the Quick Access Toolbar.	Quick Access Toolbar	Fundamental
	Ribbon	Create and modify elements using the Ribbon.	Ribbon	Fundamental
	Status Bar	Identify elements of the Status Bar.	Status Bar	Fundamental
	Tooltips	Set Tooltip options.	Tooltips	Fundamental
	View Control Bar	Navigate between multiple views using the View Control Bar.	View Control Bar	Fundamental
UI Navigation	Left/Right click	Differentiate between Left and Right click functionality.		Fundamental
	Middle click	Describe Middle click functionality.		Fundamental
	ViewCube	Demonstrate viewport navigation using the View Cube.	Overview of the ViewCube	Fundamental
	SteeringWheels	Demonstrate viewport navigation using the Steering Wheels.	SteeringWheels	Fundamental
	InfoCenter	Summarize using the InfoCenter to search multiple sources at once.	InfoCenter	Fundamental
Project Settings	Annotation Styles	Create and modify leader arrowhead, text note, dimension, and loaded tag styles in a project.	Annotation Styles	Fundamental
	Colors	Demonstrate setting different colors of multiple elements.	Colors	Fundamental
	Creating a Custom Project Template	Create a custom Template.	Project Templates	Fundamental
	Detail Level	Modify the display of geometry using different view scales.	Detail Level	Fundamental

Project Management | Tools

Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
Project Settings	Setting Options	Configure global settings for Revit.	Setting Options	Fundamental
	Project Location and Orientation	Set the project location on the globe.	Project Location and Orientation	Fundamental
	Project Units	Modify the units used in a project for different disciplines.	Project Units	Fundamental
	Snaps	Modify Snap settings including customization.	Snaps	Fundamental
	Specifying Project Information	Set and change project information and define how it affects project organization.	Project Information	Fundamental
	View Templates	Select and manipulate templates.	View Templates	Fundamental



Image courtesy of Teapot Creation

Visualization

Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
Rendering	mental ray	Identify functions of the mental ray rendering engine; Describe the function of the final gather and beauty passes.	Rendering Best Practices	Fundamental
	Anti-Aliasing	Define aliasing in an image and give examples of how to control it.	Render Performance and Image Size/Quality	Fundamental
	Reflection / Refraction	Define the terms: reflection, refraction, and translucency. Explain the correlation with surface glossiness.	Render Quality Settings	Fundamental
	Lighting Quality	Contrast direct illumination with indirect illumination and describe how they are calculated.	Render Performance and Lighting	Fundamental
	Shadows	Describe the umbra and penumbra of a shadow, how they are formed, and how they influence the perception of an object.	Render Quality Settings	Fundamental
Material Theory	Material Theory	Define the angle of incidence and compare the interaction of light with surface features.	Generic Material Properties	Fundamental
	Diffuse Color	Define the term Diffuse Color. Compare solid shades and texture maps.	Generic Material Properties	Fundamental
	Reflection / Refraction	Describe the effects of reflection and refraction on surface appearance; Describe how glossiness affects them.	How Refractions and Reflections Affect Render Performance	Fundamental
	Bump / Cutout	Define the terms Bump and Cutout maps; Describe their function.	Generic Material Properties	Fundamental
Photometric Lighting	Lighting Physics	Describe the transmittance of light and how it determines appearance of what we see.	Lights Overview	Fundamental
	Daylight	Define the two components of daylight.	Daylight Portals	Fundamental
	Lighting Fixtures	Categorize the general types of lights used in architecture by lamp type and function.	Lighting Fixtures	Fundamental

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Rendering Quality	Anti-Aliasing	Compare the impact of increasing and decreasing Anti-Aliasing on rendering time and quality.	Render Performance and Image Size/Quality	Fundamental
	Raytrace Bounces	Compare the impact that editing reflection bounces, refraction bounces, and glossiness samples has on rendering quality and time.	How Refractions and Reflections Affect Render Performance	Fundamental
	Shadow Quality	Compare the effects of increasing Shadow Quality on rendering quality and time.	Render Quality Settings	Fundamental
Material Properties	Color Schemes	Describe what constitutes a well designed Color Scheme for a value and a map; Demonstrate how to locate source materials.	Color Scheme Overview	Fundamental
	Reflection / Refraction	Describe how to analyze material samples in order to simulate their behavior.	Render Appearance Properties	Fundamental
	Bump / Cutout	Illustrate what makes a good bump sample and demonstrate how to locate source materials.	Generic Material Properties	Fundamental
Daylight	Exterior	Construct examples of direct sunlight and indirect skylight and describe how they affect the appearance of a building.	Controlling Lighting in a Rendered Image	Fundamental
	Interior	Construct examples of the effects of direct sunlight and indirect skylight on building interiors; Describe how they are affected by facing, time of day, and time of year.	Controlling Lighting in a Rendered Image	Fundamental
Artificial Lights	Direct Lights	Create and place direct lights (i.e. spots and washes) and describe the perception of overall lighting.	Lights Overview	Fundamental
	Indirect Lights	Demonstrate the use of indirect lights in a building.	Lights Overview	Fundamental



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Rendering Dialog	View Templates	Demonstrate the use of View Templates for collecting render properties.	View Templates for Render Settings	Fundamental
	Output Settings	Demonstrate how to set and modify the output size.	Controlling the Size of a Rendered Image	Fundamental
	Controlling Lighting	Demonstrate how to control the lighting model, sun parameters, and lighting groups.	Controlling Lighting in a Rendered Image	Fundamental
	Background	Demonstrate setting and modifying the background sky and the use of haze models.	Specifying the Background for a Rendered Image	Fundamental
	Rendered Image	Demonstrate the use of exposure control on a rendered image.	Adjusting the Exposure of a Rendered Image	Fundamental
Quality Settings	Anti-Aliasing	Contrast the effects of improved image precision on appearance and render times.	Render Performance and Image Size/Quality	Fundamental
	Reflection / Refraction	Demonstrate the effects of increased raytrace bounces and blurriness on image quality and rendering times.	How Refractions and Reflections Affect Render Performance	Fundamental
	Soft Shadows	Demonstrate the effects of soft shadows on image quality and rendering times.	Render Quality Settings	Fundamental
	Indirect Illumination	Demonstrate the effects of indirect illumination settings on the spread of light through out the scene and the changes in rendering times.	Lights Overview	Fundamental
Creating Materials	Diffuse Color	Analyze several different materials to develop a diffuse color for creating a material.	Render Appearance Properties	Fundamental
	Reflection / Refraction	Analyze several different materials to develop reflection and refraction values for creating a material.	Render Appearance Properties	Fundamental
	Bump/Cutout	Analyze several different materials to develop bump and cut out values for creating a material	Render Appearance Properties	Fundamental
Preset Materials	Autodesk Materials	Categorize the available material libraries created by Autodesk and illustrate how these are now standardized across platforms.	Materials	Fundamental
Exterior	Daylight	Create a basic exterior scene and compare the effects of time, date, and orientation on the appearance of the building.	Solar Studies	Fundamental
	Artificial	Light an exterior scene with light fixtures and contrast the changes in appearance and visibility over the daylight image.	Lighting Fixtures	Fundamental



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Visualization | Activity

Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
Interior	Daylight	Create an interior scene with skylights and windows and describe the effects of the time, date, and orientation on the appearance of the space.	Solar Studies	Fundamental
Interior	Artificial	Light an interior scene with light fixtures and contrast the change in appearance over the daylight image.	Lighting Fixtures	Fundamental

Topic	Sub-Topic	Objective / Learning Outcome	Reference	Level
Rendering	Defining the View Area to Render	Define and modify the View Area to Render	Defining the View Area to Render	Fundamental
	Specifying the Render Quality	Modify the Render Quality using both presets and Custom Settings	Specifying the Render Quality	Fundamental
	Controlling the Size of the Rendered Image	Modify the size of the Rendered Image	Controlling the Size of the Rendered Image	Fundamental
	Controlling Lighting in a Rendered Image	Modify the lighting in a Rendered Image	Controlling Lighting in a Rendered Image	Fundamental
	Specifying the Background for a Rendered Image	Modify the background for a Rendered Image	Specifying the Background for a Rendered Image	Fundamental
Details	Plants and Entourage	Create and modify plants and entourage	Plants and Entourage	Fundamental
	Decals	Create and modify decals	Decals	Fundamental
Materials	Overview	Summarize materials and their effect on the look of the scene	Materials Overview	Fundamental
	Material Browser	Explain the functionality of the Material Browser	Materials	Fundamental
	Searching for a Material	Demonstrate how to search for a material	Searching for a Material	Fundamental
	Applying Materials to Elements	Demonstrate the application of materials to elements	Applying Materials to Elements	Fundamental
	Changing the Display Properties of a Material	Change the display properties of a material	Changing the Display Properties of a Material	Fundamental
	Changing the Render Appearance of a Material	Change the Render Appearance of a material	Changing the Render Appearance of a Material	Fundamental
	Changing Material Identity Data	Change the Material Identity Data	Changing Material Identity Data	Fundamental
	Changing Material Physical Data	Change the Material Physical Data	Changing Material Physical Data	Fundamental
	Creating a Material	Create a new material	Creating a Material	Fundamental
	Renaming a Material	Rename a material	Renaming a Material	Fundamental
	Deleting a Material	Demonstrate how to delete a material	Deleting a Material	Fundamental
	Texture Alignment	Demonstrate the alignment of a texture	Texture Alignment	Fundamental

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Shaders	Autodesk Material Library	Summarize the Autodesk Materials and compare the shades	New in Revit Architecture 2011	Fundamental
Lighting	Overview	Summarize lighting and the effect on the scene	Lights Sources	Fundamental
	Lighting Fixtures	Place and modify lighting fixtures that can emit light from one or more sources	Lighting Fixtures	Fundamental
	Light Sources	Describe the role of a light source in a light fixture in emitting light	Defining a Light Source	Fundamental
	Photometrics and IES Files	Summarize the use of photometric lights and IES files	Photometrics and IES Files	Fundamental
Light Groups	Opening the Artificial Lights Dialog	Explain the functionality of the Artificial Lights Dialog	Opening the Artificial Lights Dialog	Fundamental
	Creating a Light Group	Demonstrate how to create a Light Group	Creating a Light Group	Fundamental
	Adding and Removing Lights in a Light Group	Demonstrate how to add and remove Lights from a Group	Adding and Removing Lights in a Light Group	Fundamental

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Primary authors:

Adam Crespi, Stephen Gabriel, Dwane Lindsey, David Webster

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Michael Sehgal

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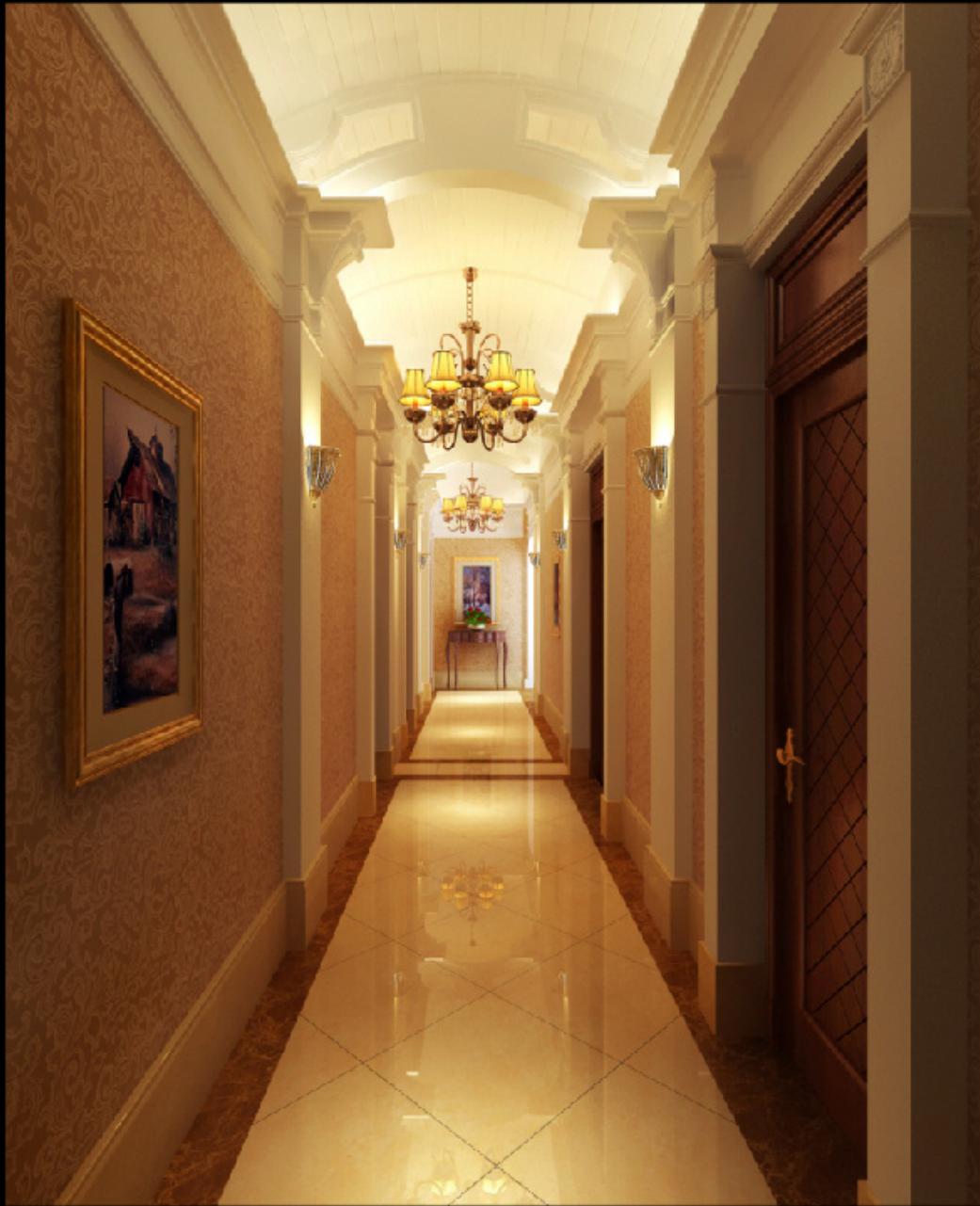


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