

Instructor's Guide for Families and Parameters for Architectural Design

This instructor guide is a comprehensive tool for facilitating this content in the classroom. Prepare to teach this course by thoroughly reviewing this document, as well as all related course materials and resources. We suggest some knowledge of building design and construction terminology would help to teach this course.

The overall course contains the following resources:

- 3 hours of video lessons covering all the topics in the course.
- Dataset files for use when following the video lessons.
- Quiz questions with timecodes for remedial knowledge check.
- Exam-style questions at the conclusion of the course.
- 6 practice exercises with exercise files and solution videos.
- 2 challenge assignments with recommended assessment criteria.
- 1 end-of-course challenge assignment with recommended assessment criteria.

Pre-requisites:

This course covers families and parametric design principles in Revit and is intended for students who already have a basic knowledge of modeling in Revit. Some knowledge of building design and construction terminology and general computer literacy is recommended.

Structure of the course:

The course is split into four lessons and is designed to cover the advanced skills required to start creating families using Revit.

Video lessons:

Each video lesson is between 6 and 12 minutes long. They all begin with a list of Learning Objectives covered in the video. The dataset mentioned throughout all the videos are available if students wish to follow along or practice after the video.

All the videos will take 3 hours to watch, although if you are using the datasets and following along this will increase the time.

Practice exercises:

There are 6 practice exercises included, each exploring a different set of topics. The practice exercises are designed to give students an opportunity to test their knowledge and apply what they have learned. Each practice exercise is accompanied by a video solution. The practice exercises are shown below along with recommended durations:

Practice Exercise Schedule	
Title	Duration
Practice Exercise: Control reference plane properties	6 Mins
Practice Exercise: Create new family types	7 Mins
Practice Exercise: Control interchangeable components	5 Mins
Practice Exercise: Create void sweeps	10 Mins
Practice Exercise: Create a blend	10 Mins
Practice Exercise: Create and work with formulae	7 Mins

Challenge assignments:

There are 2 challenge assignments included, each one focusing on a set of topics covered in the course. Students are presented a challenge in an applicable real-world situation, and they apply their skills and the techniques learned to solve the challenge. Additionally, there is an end-of course challenge that encompasses multiple sections of the course. A grading rubric is provided for the instructor, giving guidelines on assessment criteria and suggested mark weighting for specific tools and processes that may have been used. The challenge assignment exercises are shown with the relevant lesson. You can also encourage students to work in small groups, first discussing the desired outputs from the model and working collectively to derive the best process and execution in Revit.

Challenge Assignment Schedule	
Title	Duration
Challenge Assignment: Create an arm rest	10 Mins
Challenge Assignment: Control cupboard doors with formulae	15 Mins
Course Challenge: Create a 3D clash detection family	25 Mins

Quiz questions:

Quiz questions are included with each video of the course and the timecodes are included so that students can review the related sections in the video for questions they have answered incorrectly.

Exam-style questions:

Exam-style questions are included at the conclusion of the video course for students to measure what they have learned against realistic multiple-choice questions.

Teaching the Course Contents in a Class

Each lesson is listed below along with suggested time allocations for instruction. The referenced demonstrations are based on the video instruction included in the course. Review the video tutorials for the detailed instruction in each lesson.

Lesson 01: Revit family basics for architectural design

Total Time In-Class Required for Lesson: 50 minutes

Discuss Objectives: 5 Minutes

Demonstrate: 30 Minutes

Discussion Prompts:

- What are the benefits to using families in Revit projects?

Learning Objectives

- Describe the various families in Revit and their uses.
- Use the Family Editor and its tools.
- Use family templates and create custom family templates.
- Create reference planes and review their properties.
- Create custom family types.

Review Objectives: 5 Minutes

Practice exercise: Control reference plane properties (6 Minutes)

Assessment: quiz questions are available with each video.

Lesson 02: Parameters for architectural design

Total Time In-Class Required for Lesson: 55 minutes

Discuss Objectives: 5 Minutes

Demonstrate: 35 Minutes

Discussion Prompts:

- What are parameters used for in Revit? What is an example of a parameter?

Learning Objectives

- Describe how parameters are used in Revit.
- Create type and instance parameters.
- Create shared parameters.
- Create a wall-based family.
- Apply tags and create schedules.

Review Objectives: 5 Minutes

Practice exercise: Create new family types (7 Minutes)

Practice exercise: Control interchangeable components (5 Minutes)

Assessment: quiz questions are available with each video.

Lesson 03: Family modeling with solid and void forms

Total Time In-Class Required for Lesson: 75 minutes

Discuss Objectives: 5 Minutes

Demonstrate: 35 Minutes

Discussion Prompts:

- What are some examples of solids (e.g., sphere, cube, cone, cylinder) and what are their defining features?

Learning Objectives

- Use the Family Editor's solid and void modeling tools in a project.
- Create a profile family.
- Create solid geometry.
- Create a solid sweep.
- Load and edit profile families.

Review Objectives: 5 Minutes

Practice exercise: Create void sweeps (10 Minutes)

Practice exercise: Create a blend (10 Minutes)

Challenge assignment: Create an arm rest (10 Minutes)

Assessment: quiz questions are available with each video.

Lesson 04: Architectural family content

Total Time In-Class Required for Lesson: 60 minutes

Discuss Objectives: 5 Minutes

Demonstrate: 30 Minutes

Discussion Prompts:

- What are the families in Revit that are specific to architecture?

- Describe the benefits of using nested families.

Learning Objectives

- Create a 2D detail component.
- Create a door family and use nested families.
- Work with profile families.
- Create a bookshelf and use formulae to control family geometry.
- Assign parameters to report on key dimensions and materials.
- Create a solid sweep.
- Load and edit profile families.
- Create an extrusion.
- Create an in-place component.
- Create a custom furniture tag.

Review Objectives: 5 Minutes

Practice Exercise: Create and work with formulae (7 Minutes)

Challenge: Control cupboard doors with formulae (15 Minutes)

Optional: Course challenge: Create a 3D clash detection family (25 Minutes)

Assessment: quiz questions are available with each video.