

Learn Forma Preconstruction in 90 minutes

Instructor guide

Course duration: ~5 hours, depending on lecture time

Recommended student level: Beginner students in construction management or related fields

Product: Autodesk Forma for Construction

This instructor guide is a comprehensive tool for facilitating this course in the classroom. Prepare to teach the course by thoroughly reviewing this document, as well as all related course materials and resources. You may also share this document with your students to guide them in their assignments. It's always recommended that you work through the course yourself in preparation for each module.

Learning objectives:

After completing this course, you will be able to:

- Access and navigate a Forma Preconstruction project environment.
- Configure a project for takeoff and estimating
- Extract and organize quantities from 2D drawings and 3D models.
- Prepare takeoff data for use in cost estimation.
- Develop structured cost estimates using Estimate.
- Update and refine estimates as project information changes.

The overall course contains the following resources:

- Three video modules covering all the topics in the course.
- Dataset files for use when following the video modules.
- Quiz questions with timecodes for remedial knowledge check.
- Exam-style final test questions at the conclusion of the course.
- Three practice exercises with exercise files and solutions.
- One challenge assignment with recommended assessment criteria.
- Lecture slides that introduce topics and themes covered in the course.

Structure of the course:

The course is split into 3 modules and is designed to follow a structured, hands-on workflow that reflects real preconstruction processes used in practice. Across the modules, you will learn how to access and navigate a project on Autodesk Forma, extract and manage quantities from 2D drawings and 3D models and develop structured cost estimates.

Videos:

Each video begins with a list of learning objectives covered in the video. The dataset mentioned throughout all the videos are available for students to follow along or practice after the video.

Dataset:

This course has one dataset folder including Revit models in imperial and metric units and some additional files to be used throughout the course and course series. This course is part of a series of four courses, (1) Learn Data Management, (2) Learn Build, (3) Learn Design Collaboration and Model Coordination, and (4) Learn Preconstruction. The dataset folder is the same for all four courses. It is recommended to offer the Learn Data Management course first since it teaches students how upload the dataset folder to Autodesk Forma. If you decide not to offer the Learn Data Management first, you need to upload the dataset folder yourself to Autodesk Forma as discussed in the Instructor setup guide video.

Practice exercises:

There are 3 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 an answer key. Students should follow along the videos in the module before attempting the practice exercise for that module.

Challenge exercise:

One challenge assignment is included, focusing on a set of topics covered in the course. Students are presented with a challenge in an applicable real-world situation, and they apply their skills and the techniques learned to solve the challenge. A grading rubric is provided for the instructor, giving guidelines on assessment criteria. You can also encourage students to work in small groups, first discussing the desired outputs and working collectively to derive the best process and execution in the software.

Video 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.

Final test questions:

A cumulative set of exam-style questions are included at the conclusion of the course for students to measure what they have learned against realistic multiple-choice questions.

Lecture slides:

Lecture slides are offered to help facilitate in-class discussion.

Using the course in the classroom or self-paced

This course can be implemented as an independent, self-paced project, or can be completed in the classroom in a team setting. A couple of options are outline below:

Option 1: Self-paced

Each student will log into Autodesk.com/learn using their Autodesk Account credentials and follow along with the project instruction. (Alternatively, you may choose to assign the material through your LMS). Students can work through the projects on their own by following the project steps and challenge instructions, and by exploring any supporting assets. This is a great way to allow students to move through the learning materials at their own pace and explore additional learning opportunities or increase shop time. The self-paced option can also be used for out of classroom or remote assignments. A certificate of completion is awarded once the course is completed.

Option 2: Instructor-led

In this option, instructors will log into Autodesk.com/learn using their Autodesk Account credentials and download the learning materials. Instructors can then guide the students through each project, using the accompanying lecture slides for instruction and step-by-step guides and practice exercises as handouts. This option allows for guided, step-by-step classroom engagement. This approach works well in a more traditional classroom setting and will allow instructors to easily keep students on the same pace. The challenge exercise can be used as a learning opportunity for students who complete their work early or are looking for additional hands-on opportunities.

Course contents

Each module is listed below along with suggested time allocations for instruction. Review the video tutorials for the detailed instruction in each module.

SETUP FOR THE COURSE

IMPORTANT: Be sure to review the set-up videos before beginning this course. There is one video for the instructor and one for the student in the Getting Started section of the course.

Module 1: Set up Forma Data Management and Forma Preconstruction

Navigate a project on Forma Preconstruction

Total time required for module: 15 minutes

Discuss objectives: 1 minute

Demonstrate: 3 minutes

- Describe the structure of a Forma preconstruction project.
- Identify how data is organized and shared.
- Explain how tools connect within a project environment.

Hands-on time: 10 minutes

Review objectives: 1 minute

Datasets:

All the files in the dataset folder will be uploaded to Files in Data Management

Assignments (additional):

- **Quiz:** 2 minutes
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Set up a preconstruction project

Total time required for module: 15 minutes

Discuss objectives: 1 minute

Demonstrate: 3 minutes

- Recognize the role of the preconstruction library.
- Configure project settings and parameters.
- Prepare the environment for takeoff and estimating.

Hands-on time: 10 minutes

Review objectives: 1 minute

Datasets:

The needed files are uploaded to Files in Data Management.

Assignments (additional):

- **Practice Exercise 1: Navigate sheets and models:** 15 min
- **Quiz:** 2 minutes

Module 2: Perform quantity takeoffs in Forma Takeoff

Perform Takeoff count-based quantities from 2D drawings

Total time required for module: 15 minutes

Discuss objectives: 1 minute

Demonstrate: 3 minutes

- Navigate 2D drawing sets in Takeoff.
- Create takeoff types using Count tools.
- Create and update output definitions.

Hands-on time: 10 minutes

Review objectives: 1 minute

Datasets:

The needed files are uploaded to Files in Data Management.

Assignments (additional):

- **Quiz:** 2 minutes
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Perform Takeoff area and line-based quantities from 2D drawings

Total time required for module: 15 minutes

Discuss objectives: 1 minute

Demonstrate: 3 minutes

- Create takeoff packages.
- Add outputs to takeoff types.
- Take off quantities with area and line tools.

Hands-on time: 10 minutes

Review objectives: 1 minute

Datasets:

The needed files are uploaded to Files in Data Management.

Assignments (additional):

- **Quiz:** 2 minute
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Create BIM-based takeoff types

Total time required for module: 15 minutes

Discuss objectives: 1 minute

Demonstrate: 3 minutes

- Use the model browser and filters.
- Form clusters.
- Take off quantities with BIM tools.

Hands-on time: 10 minutes

Review objectives: 1 minute

Datasets:

The needed files are uploaded to Files in Data Management.

Assignments (additional):

- **Quiz:** 2 minutes
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Use formulas in BIM-based takeoffs

Total time required for module: 15 minutes

Discuss objectives: 1 minute

Demonstrate: 3 minutes

- Create additional outputs using formulas.
- Update the inventory.

Hands-on time: 10 minutes

Review objectives: 1 minute

Datasets:

The needed files are uploaded to Files in Data Management.

Assignments (additional):

- **Practice Exercise 2: Measure quantities in Takeoff:** 30 min
 - **Quiz:** 2 minutes
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Module 3: Estimate costs in Forma Estimate

Transfer quantities to Estimate

Total time required for module: 15 minutes

Discuss objectives: 1 minute

Demonstrate: 3 minutes

- Send quantities to Estimate.
- Customize cost fields.
- Organize cost data.

Hands-on time: 10 minutes

Review objectives: 1 minute

Datasets:

The needed files are uploaded to Files in Data Management.

Assignments (additional):

- **Quiz:** 2 minutes
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Apply unit costs to items

Total time required for module: 15 minutes

Discuss objectives: 1 minute

Demonstrate: 3 minutes

- Apply unit costs to estimate items.
- Calculate direct costs from quantities.
- Add cost markups.

Hands-on time: 10 minutes

Review objectives: 1 minute

Datasets:

The needed files are uploaded to Files in Data Management.

Assignments (additional):

- **Quiz:** 2 minutes
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Update quantities and costs

Total time required for module: 15 minutes

Discuss objectives: 1 minute

Demonstrate: 3 minutes

- Update quantities from revised takeoff data.
- Adjust cost values in existing estimates.
- Maintain accuracy during estimate revisions.

Hands-on time: 10 minutes

Review objectives: 1 minute

Datasets:

The needed files are uploaded to Files in Data Management.

Assignments (additional):

- **Practice Exercise 3: Calculate direct costs in Estimate:** 15 min
 - **Quiz:** 2 minutes
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Next steps: End of course (additional)

- **Challenge exercise: Estimate costs of systems components in Autodesk Preconstruction:**
90 minutes
- **End-of-course exam questions:** 20 minutes