

Design Performance and Sustainability with Autodesk Forma, Revit, and Insight

Instructor guide

Course duration if teaching with this material in class: 5 hours or more depending on lecture time and additional challenge assigned.

Recommended student level: Students in architecture, sustainability, engineering, and construction programs

Products: Autodesk Forma, Autodesk Revit, Autodesk Insight

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.

*For additional tips for teaching this course, refer to the lecture notes in the accompanying PowerPoint lecture slides.

Learning objectives:

- Describe core principles of outcome-based BIM and sustainable design.
- Use Autodesk Forma and Autodesk Insight for performance-driven design.
- Integrate Revit models with Forma and Insight for iterative analysis.
- Apply sustainability metrics and environmental analysis tools.
- Demonstrate outcomes through challenges and assessments.

The overall course contains the following resources:

- 4 video modules covering all the topics in the course.
- Revit dataset files for use when following the videos and exercise in module 4.
- Quiz questions with timecodes for remedial knowledge check.
- Exam-style final test questions at the conclusion of the course.
- 4 practice exercises with video solutions.
- 1 challenge assignments with recommended assessment criteria.
- Lecture slides that introduce topics and themes covered in the course.

Pre-requisites:

In this course, learners gain essential principles and practice for sustainable design and performance using powerful Autodesk tools including Forma, Revit, and Insight. Using a real-world example throughout the course, students have the opportunity to experiment with real data for their project. The course offers students some of the core concepts to start using these tools and could be assigned in the first week or two of class.

This course is designed to provide students with a foundational understanding of sustainable design workflows using Autodesk Forma, Revit, and Insight. By exploring these workflows, students will gain insights into how these tools create smarter, low-carbon, and performance-optimized buildings.

To that end, students should be given access to the various products within the course. Descriptions and tips are included **Instructions for granting students product licenses are included with the Teaching Supplements downloads as a separate software guide PDF for the instructor.**

Structure of the course:

The course is split into 4 modules and includes the following components.

Videos:

Each video begins with a list of learning objectives covered in the video. The details of the Forma project used in the example can be found in the PDF included in the Course Downloads. Students can use this project if they wish to follow along or practice after the video.

Dataset:

The example used in the videos is of a fictitious building project in Austin, Texas. The **Proposed Building Program.pdf** file includes reference information on the project program and dimensions for each building. Also included is a simple Revit model (**Austin Building B1_Starting File.rvt**) used in the videos and the practice exercise in the final module of the course.

Practice exercises:

There are 4 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.

Challenge exercise:

A course 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 lab 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 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.

Each section is listed below along with suggested time allocations for instruction. The referenced demonstrations are based on the step-by-step instruction included in the videos.

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.

Module 1 Outcome-based BIM and sustainable design foundations

Total overall time for module: 25 minutes

Module 1-01 What is outcome-based BIM?

Total time required for module unit: 15 minutes

Discuss course objectives: 1 minute

Demonstrate: 4 minutes

- Assess how Forma's outcome-based approach transforms the design process.
- Evaluate how Autodesk Insight today boosts total carbon understanding of a design solution.
- Compare the differences between outcome-based and model-based design methods.

Datasets: 10 minutes

Download datasets from course resources. In advance to following along with this course's content, instructor should assign the products to students and create a hub in Forma. At this point, check students' access and that downloaded files open.

Assignments (additional):

- **Quiz: 1 minute**
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Module 1-02 The role of sustainability in modern AEC projects

Total time required for module unit: 10 minutes

Discuss course objectives: 2 minutes

Demonstrate: 8 minutes

- Define sustainability within the context of architecture, engineering, and construction (AEC) and explain its growing importance in shaping industry practices.
- Identify key drivers—including climate change, regulation, and client demand—that are accelerating the adoption of sustainable design strategies across AEC disciplines.
- Recognize how performance-based tools and outcome-driven workflows support more sustainable, resilient, and future-ready built environments.

Assignments (additional):

- **Quiz:** 1 minute
 - **Article:** Architects tackle carbon: Good for business and the environment (11 min read)
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Module 2 Getting started with Autodesk Forma for conceptual design

Total overall time for module: 60 minutes

Module 2-01 Learn to use the Forma interface and features

Total time required for module unit: 12 minutes

Discuss objectives: 2 minutes

Demonstrate: 5 minutes

- Navigate the Autodesk Forma user interface, including the toolbar, navigation controls, and data panels.
- Identify the primary features and functions available in Forma for early-stage design exploration.
- Describe how Forma organizes project data, site context, and environmental layers to support informed design decisions.

Hands-on time: 5 minutes

Assignments (additional):

- **Quiz:** 1 minute
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Module 2-02 Explore Forma analysis in a sample project

Total time required for module unit: 12 minutes

Discuss objectives: 2 minutes

Demonstrate: 8 minutes

- Distinguish between the types of environmental analysis available in Autodesk Forma, including daylight potential, sun hours, wind flow, and noise levels.
- Describe how Forma visualizes pre-calculated analysis results to support early-stage, data-informed design decisions.
- Describe the potential of Forma's integrated analysis tools to identify environmental challenges and opportunities—without needing to switch platforms or rely on external software.

Review objectives: 2 minutes

Assignments (additional):

- **Quiz:** 1 minute
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M2-03 Set up a new Forma project

Total time required for module unit: 18 minutes

Discuss objectives: 2 minute

Demonstrate: 5 minutes

- Select a project site in Autodesk Forma using location-based tools and map integration.
- Modify the site context by removing existing buildings to create a clean slate for design exploration.
- Create and manage a Proposal space to organize future design iterations within your Forma project.

Hands-on time: 10 minutes

Review objectives: 1 minute

Datasets:

***Proposed Building Program.pdf** includes reference information on the project program and dimensions for each building.*

Assignments (additional):

- **Quiz:** 1 minute
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M2-04 Explore massing, contextual data, and quick metrics

Total time required for module unit: 18 minutes

Discuss objectives: 2 minute

Demonstrate: 5 minutes

- Create simple massing forms to represent proposed building volumes on a selected site.
- Analyze contextual site data such as terrain, surroundings, and building adjacencies.
- Track real-time metrics such as gross building area to evaluate design scale and feasibility during early concept development.

Hands-on time: 10 minutes

Review objectives: 1 minute

Datasets:

***Proposed Building Program.pdf** includes reference information on the project program and dimensions for each building.*

Assignments (additional):

- **Quiz:** 1 minute
- **Practice Exercise:** Create a new Autodesk Forma project -10 min (or use in class for hands-on time in this module)

Module 3 Evaluating environmental performance in early design with Forma

Total overall time for module: 70-80 minutes

M3-01 Maximize natural light using daylight and sun hour analysis

Total time required for module unit: 17 minutes

Discuss objectives: 1 minute

Demonstrate: 5 minutes

- Explain the purpose and benefits of using sun hours and daylight potential analyses in early-stage design.
- Interpret sun exposure maps and daylight potential simulations in Forma to evaluate how building geometry affects access to daylight.
- Apply daylight analysis results to refine building placement, height, and massing strategies that maximize natural light and reduce reliance on electric lighting.

Hands-on time: 10 minutes

Review objectives: 1 minute

Datasets:

Proposed Building Program.pdf includes reference information on the project program and dimensions for each building.

Assignments (additional):

- Quiz: 1 minute
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M3-02 Shape comfortable spaces with wind flow analysis

Total time required for module unit: 17 minutes

Discuss objectives: 1 minute

Demonstrate: 5 minutes

- Differentiate between rapid and detailed wind analysis modes in Autodesk Forma and understand their appropriate use cases.
- Interpret wind flow and wind comfort maps to assess how wind interacts with massing and site features.
- Apply wind analysis insights to inform early design decisions related to building placement, orientation, and outdoor comfort.

Hands-on time: 10 minutes

Review objectives: 1 minute

Datasets:

***Proposed Building Program.pdf** includes reference information on the project program and dimensions for each building.*

Assignments (additional):

- **Quiz:** 1 minute
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M3-03 Explore how site-specific climate impacts with micro-climate analysis

Total time required for module unit: 17 minutes

Discuss objectives: 1 minute

Demonstrate: 5 minutes

- Explain what micro-climate means in the context of architectural site design and why it matters.
- Describe how Forma visualizes micro-climate conditions using the thermal comfort index (UTCI).
- Interpret Forma's micro-climate analysis results to inform early-stage design strategies that enhance comfort and reduce environmental impact.

Hands-on time: 10 minutes

Review objectives: 1 minute

Datasets:

***Proposed Building Program.pdf** includes reference information on the project program and dimensions for each building.*

Assignments (additional):

- **Quiz:** 1 minute
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M3-04 Design with sound in mind using traffic analysis

Total time required for module unit: 17 minutes

Discuss objectives: 1 minute

Demonstrate: 5 minutes

- Describe the difference between rapid and detailed noise analysis tools in Autodesk Forma and when to use each.
- Interpret noise maps and decibel readings to understand traffic noise impact across a project site.
- Apply noise analysis insights to adjust site layout, massing, or buffer zones to reduce noise exposure and improve user comfort.

Hands-on time: 10 minutes

Review objectives: 1 minute

Datasets:

Proposed Building Program.pdf includes reference information on the project program and dimensions for each building.

Assignments (additional):

- **Quiz:** 1 minute
 - **Practice Exercise:** Analyze an Autodesk Forma project – 20 min (or use in class for hands-on time in this module)
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Module 4 Performance-driven design with Revit and Autodesk Insight

Total overall time for module: 80-90 minutes

M4-01 Create an energy analysis model (EAM) in Revit

Total time required for module unit: 22 minutes

Discuss objectives: 1 minute

Demonstrate: 10 minutes

- Explain what an Energy Analysis Model (EAM) is and how it is automatically generated from Revit models.
- Differentiate between EAM creation from conceptual massing vs. detailed architectural models.
- Prepare a Revit model for EAM generation using the correct model setup, location, and energy settings.

Hands-on time: 10 minutes

Review objectives: 1 minute

Datasets:

Austin Building B1_Starting File.rvt

Assignments (additional):

- **Quiz:** 2 minutes
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M4-02 Simulate energy performance with Insight and EnergyPlus

Total time required for module unit: 20 minutes

Discuss objectives: 1 minute

Demonstrate: 8 minutes

- Export an EAM from Revit to Autodesk Insight for advanced energy simulation.
- Learn how Insight supports exporting data to the AIA 2030 DDx
- Interpret key results from energy simulation outputs, including Energy Use Intensity (EUI), operational energy consumption, and performance drivers.

Hands-on time: 10 minutes

Review objectives: 1 minute

Datasets:

Austin Building B1_Starting File.rvt

Assignments (additional):

- **Quiz:** 2 minutes
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M4-03 Map embodied carbon from Revit to Insight

Total time required for module unit: 20 minutes

Discuss objectives: 1 minute

Demonstrate: 8 minutes

- Describe how Autodesk Insight links Revit model elements to embodied carbon definitions.
- Use the Embodied Carbon Details panel and Construction Summary to assign, review, and modify carbon data.
- Explain the role of embodied carbon databases like EC3 in informing early-stage material impact decisions.

Hands-on time: 10 minutes

Review objectives: 1 minute

Datasets:

Austin Building B1_Starting File.rvt

Assignments (additional):

- **Quiz:** 2 minutes
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M4-04 Visualize and compare design options with Insight dashboards

Total time required for module unit: 22 minutes

Discuss objectives: 1 minute

Demonstrate: 10 minutes

- Create a custom dashboard in Autodesk Insight to visualize project-specific performance data.

- Organize and compare energy and embodied carbon metrics across multiple design scenarios.
- Apply design factors and filters to test “what if” scenarios and evaluate the impact of different choices on performance outcomes.

Hands-on time: 10 minutes

Review objectives: 1 minute

Datasets:

Austin Building B1_Starting File.rvt

Assignments (additional):

- **Quiz:** 2 minutes
 - **Practice Exercise 7:** Create an EAM and view results in Insight – 20 min (or use in class for hands-on time. The dataset file is included in the course downloads.)
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Next steps (additional):

End-of-course exam questions: 10 minutes

Course Challenge exercise: 120 minutes

In the *Create a performance-driven massing and sustainability strategy* challenge, you will model three mixed-use buildings of varying sizes and heights, evaluate their environmental performance using Autodesk Forma, and refine your massing to enhance thermal comfort, daylight, and sustainability outcomes. You will then export your optimized model into Autodesk Revit and Autodesk Insight for deeper energy and carbon evaluation.

Grading: A grading rubric is provided in the Teaching Supplements to provide you with a guide to grade your students on this challenge.