



Fusion CORE: Design

Instructor guide

Instructor-led course duration: ~480 minutes

Level: Foundational

Product: Autodesk® Fusion®

This instructor guide is a comprehensive tool for facilitating this in the classroom. Prepare to teach this course by thoroughly reviewing this document, as well as all related course materials and resources.

We've summarized the core Fusion skills in the Fusion CORE: Design course so you can familiarize yourself with them before delivering this learning content in the classroom. It's always recommended that you work through the course yourself in preparation for each lesson.

Learning objectives:

- Identify how designs are developed
- Create and manipulate freeform bodies
- Create 2D sketches
- Create 3D solid features
- Create 3D surfaces
- Apply features such as fillets, holes, and patterns

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

Getting started

Total time required for module: 20 minutes

Discuss objectives: 3 minutes

Demonstrate: 10 minutes

- Review course overview and learning objectives
- Download the course resources and software
- Create an Autodesk ID
- Install the software
- Review the starter activity and articles

Hands-on time: 5 minutes

Review objectives: 2 minutes

Explore how designs are developed

Total time required for module: 32 minutes

Discuss objectives: 3 minutes

Demonstrate: 5 minutes

- Describe how requirements shape a design
- Identify when to use freeform versus surface and solid modeling
- Recognize design development as an iterative process
- Explain how design decisions impact downstream engineering and manufacturing

Hands-on time: 12 minutes

Review objectives: 2 minutes

Module quiz: 10 minutes

Create a freeform design

Total time required for module: 60 minutes

Discuss objectives: 3 minutes

Demonstrate: 10 minutes

- Create a form body
- Edit a form
- Add a creased edge
- Thicken a form

Hands-on time: 35 minutes

Review objectives: 2 minutes

Datasets:

- *02_FSAE_Rim_Blank_Designer.f3d*
- *02_FSAE_Rim_Blank_Designer_Tire1.f3d*
- *11_Sketch_Projections.f3d*
- *25_Edit_Form.f3d*
- *27_Bevel.f3d*
- *28_Thicken_Freeform.f3d*
- *40_Section_View.f3d*

Module quiz: 10 minutes

Practice exercise: Create a freeform motorcycle tire

Total time required for module 15 minutes

Dataset:

- *Motorcycle_Rim_Blank.f3d*

Challenge exercise: Create a freeform rim spoke

Total time required for module 25 minutes

Dataset:

- *Form_Rim_Spoke.f3d*

Create a complex organic surface for tire treads

Total time required for module: 40 minutes

Discuss objectives: 3 minutes

Demonstrate: 10 minutes

- Create a detailed sketch
- Create a revolve cut
- Create a revolve surface
- Extrude to a surface
- Create a pattern

Hands-on time: 15 minutes

Review objectives: 2 minutes

Datasets:

- *02_FSAE_Rim_Blank_Designer_Tire2.f3d*
- *12_Extrude.f3d*
- *13_Revolve.f3d*
- *20_Patterns.f3d*
- *32_Extend_Surface.f3d*
- *42_Construction_Planes.f3d*

Module quiz: 10 minutes

Practice exercise: Create a complex surface body

Total time required for module 20 minutes

Dataset:

- *Lofted_Radiator_Duct.f3d*

Challenge exercise: Create a complex organic surface

Total time required for module 20 minutes

Dataset:

- *Lofted_Radiator_Duct_Challenge.f3d*

Create text on the side of a tire

Total time required for module: 45 minutes

Discuss objectives: 3 minutes

Demonstrate: 15 minutes

- Create a construction plane
- Create text in a sketch
- Extrude to a surface with offset
- Create a pattern

Hands-on time: 15 minutes

Review objectives: 2 minutes

Datasets:

- *02_FSAE_Rim_Blank_Designer_Tire3.f3d*
- *12_Extrude.f3d*

- *42_Construction_Planes.f3d*

Module quiz: 10 minutes

Practice exercise: Create an emboss

Total time required for module 10 minutes

Dataset:

- *Text_Emboss.f3d*
-

Challenge: Create debossed text on a design

Total time required for module 10 minutes

Dataset:

- *Text_Deboss.f3d*
-

Create rendered images of a rim and tire

Total time required for module: 40 minutes

Discuss objectives: 3 minutes

Demonstrate: 10 minutes

- Set up a render scene
- Apply appearances to bodies
- Apply appearances to faces
- Create a rendered image

Hands-on time: 15 minutes

Review objectives: 2 minutes

Datasets:

- *02_FSAE_Rim_Blank_Designer_Tire3.f3d*
- *35_Apearances.f3d*
- *43_Render.f3z*

Module quiz: 10 minutes

Practice: Create a photorealistic render

Total time required for module 15 minutes

Dataset:

- *FSAE_Rim.f3z*
-

Challenge: Setup and render a scene

Total time required for module 20 minutes

Dataset:

- *FSAE_Multiple_Rim_Render.f3z*
-

Project: Create a freeform based rim

Total time required for module 90 minutes

Dataset:

- *FSAE_Rim_Course_Challenge_Designer.f3d*
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Final test

Total time required for module: 15 minutes