



Fusion CORE: CAM

Instructor guide

Instructor lead course duration: ~575 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 CORE: CAM 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:

- Describe the CAM process.
- Create a CAM setup sheet.
- Create a tool library.
- Create a custom tool.
- Create a CAM setup
- Create roughing toolpaths.
- Create semi-finishing toolpaths.
- Create finishing toolpaths.
- Use simulation to validate toolpaths.
- Create and post process an NC program.

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 manufactured

Total time required for module: 30 minutes

Discuss objectives: 3 minutes

Demonstrate: 5 minutes

- Review the manufacturing workflows
- Describe key CAM process stages
- Describe the available manufacturing tools in Fusion
- Explore manufacturing tools in Fusion

Hands-on time: 9 minutes

Review objectives: 2 minutes

Module quiz: 10 minutes

CAM planning and tool setup

Total time required for module: 35 minutes

Discuss objectives: 3 minutes

Demonstrate: 10 minutes

- Import a tool library
- Create a custom tool
- Copy a tool between tool libraries

Hands-on time: 10 minutes

Review objectives: 2 minutes

Datasets:

- *CORE_CAM_INCH.tools*

Module quiz: 10 minutes

Practice exercise: Create a new bull-nose endmill

Total time required for module: 15 minutes

Dataset: NONE

Challenge exercise: Copy and populate a vendor tool

Total time required for module: 25 minutes

Dataset: NONE

Create a CAM setup for a rim

Total time required for module: 30 minutes

Discuss objectives: 3 minutes

Demonstrate: 5 minutes

- Create a CAM setup
- Define CAM stock
- Locate a WCS
- Define CAM post processor settings

Hands-on time: 7 minutes

Review objectives: 2 minutes

Datasets:

- *52_CAM_Setup.f3d*
- *04_FSAE_Rim_Front_CAM.f3d*

Module quiz: 10 minutes

Practice exercise: Import and align a vise

Total time required for module: 20 minutes

Dataset:

- *Simple_Block.f3d*
- *Imported_Vise_Model.f3d*

Challenge exercise: Select and set up a machine model in CAM

Total time required for module: 25 minutes

Dataset:

- *Machine_Model_Setup.f3d*

Create roughing toolpaths for a rim

Total time required for module: 40 minutes

Discuss objectives: 3 minutes

Demonstrate: 10 minutes

- Create a 2D adaptive roughing toolpath
- Create a 3D adaptive roughing toolpath
- Create a facing toolpath

Hands-on time: 15 minutes

Review objectives: 2 minutes

Datasets:

- *54_Face.f3d*
- *55_2D_Adaptive.f3d*
- *04_FSAE_Rim_Front_CAM_2.f3d*

Module quiz: 10 minutes

Practice exercise: Create a 3D adaptive roughing toolpath

Total time required for module: 15 minutes

Dataset:

- *3D_Adaptive_Roughing.f3d*

Challenge exercise: Create a roughing strategy for a complex part

Total time required for module: 25 minutes

Dataset:

- *Complex_Roughing_Strategy.f3d*

Create finishing toolpaths for a rim

Total time required for module: 68 minutes

Discuss objectives: 3 minutes

Demonstrate: 10 minutes

- Create a 2D offset roughing (pocket) toolpath
- Create a radial toolpath
- Create a parallel toolpath
- Create a pencil toolpath
- Create a drilling operations
- Create a trace toolpath

Hands-on time: 42 minutes

Review objectives: 2 minutes

Datasets:

- *53_2D_Contour.f3d*
- *56_2D_Pocket.f3d*
- *58_Drilling.f3d*
- *57_2D_Chamfer.f3d*
- *04_FSAE_Rim_Front_CAM_3.f3d*
- *04_FSAE_Rim_Front_CAM_3.5.f3d*
- *04_FSAE_Rim_Front_CAM_4.f3d*

Module quiz: 10 minutes

Practice exercise: Semi-finishing machining strategy on a complex part

Total time required for module 15 minutes

Dataset:

- *Semi-Finishing_Strategy.f3d*

Challenge exercise: Create a finishing machining strategy for a complex part

Total time required for module 25 minutes

Dataset:

Finishing_Strategy.f3d

Rim toolpath simulation and output

Total time required for module: 42 minutes

Discuss objectives: 3 minutes

Demonstrate: 10 minutes

- Simulate toolpaths
- Create an NC program
- Post process an NC program
- Create a setup sheet

Hands-on time: 17 minutes

Review objectives: 2 minutes

Datasets:

- *59_CAM_Simulation.f3d*
- *60_NC_Program.f3d*
- *61_Post_Process.f3d*
- *04_FSAE_Rim_Front_CAM_5.f3d*

Module quiz: 10 minutes

Practice exercise: Use toolpath simulation to find a collision

Total time required for module: 15 minutes

Dataset:

- *Toolpath_Simulation.f3d*

Challenge exercise: Simulate toolpaths with a machine model

Total time required for module: 25 minutes

Dataset:

- *Toolpath_Simulation_Machine_Model.f3d*

Project: Create toolpaths to machine a custom rim

Total time required for module: 90 minutes

Dataset:

- *CAM_Rim_Project_Setup.f3d*

Final test

Total time required for module: 15 minutes