



## Mill Design and Toolpaths

### Course Description

The Mastercam University Mill Design & Toolpaths course provides training that exceeds the minimum requirements for the first level of Mastercam Certification (Mill-CPgmM) as defined by the Mastercam Certification Advisory Committee. This course is the baseline Mastercam training at both major manufacturing companies and colleges throughout the United States. It is the equivalent of a 3-credit course at a college or university.

### Course Objectives

Upon completion, you should be able to demonstrate:

#### Geometry

- Using levels, colors
- Create and apply multiple Work Coordinate Systems and Construction Planes
- Using 2D and 3D construction methods
- 3D wireframe creation
- Geometry Selection (pre/post selection)
- Modifying current geometry (Trim, Fillet, Color, Level, Group and Attributes)
- Diameter/Radius part creation
- Geometry transformation (Scale, Rotate, etc.)

#### Solids

- Extrude, Extrude Cut, Solids Manager, and creation of curves on solids

#### Toolpath

- Efficient toolpath creation
- Example parts need to reflect holding
- Tool definition from nothing
- Depth of cut and feed rate based on tool and materials
- Appropriate toolpath operation for cutting application
- Saving custom tools to a level
- Setup sheets that will communicate what the program is cutting, with order of cuts
- Set common and individual operation defaults

- Multiple Pocketing depths, Island, Face, Island facing
- Slot milling
- Contour toolpath, Ramp, and Multiple depth
- Importing and Exporting operations
- Creating Toolpath Group
- Creating Machine Group
- Backplot, Quick Verify
- STL file creation and STL compare
- Stock setup
- Setting Machine and Control Definition
- Material library applied in Control Definition
- Drill toolpaths
- Posting G-Code
- Circle mill, Thread mill, and Slot mill toolpaths

#### Operations Manager

- Configuration
- Cut and paste geometry
- Display settings
- Tool offset registry settings
- Maximum RPM and feed rate
- Re-number tools

#### Strongly Recommended Pre-requisites

- Print reading with multiple views
- CNC machining experience
- CNC set-up experience
- Algebra and trigonometry
- Mastercam experience



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### Materials

The Mill Design & Toolpaths course requires:

- High speed internet connection
- Computer that meets the [Mastercam System Requirements](#)
- Mastercam Demo/Home Learning Version, which you can download at Mastercam U.

### Course Schedule

Because this course is available online, it can be taken at any time and at your own pace. At an educational institution, this course would typically require approximately sixty hours (for example, three nights a week for six weeks). This includes lab time to complete all examples. To get the most out of this class, plan to spend three hours per session and allow two and a half hours to take the final practical test.

### Multiple Choice Test Overview

There are pre- and post- multiple choice tests for both the design and toolpath sections of the course. You will receive a certificate of completion (PDF format) upon completion of the post-test, which will display the post-test grade. Students should have at least 30-45 minutes to complete the multiple choice question tests. These are supplied to review.

### Cost

The cost of the Mastercam University Mill Design & Toolpaths course is \$249.00.

### Course Policies

- This course is designed for one student, but allows the lectures to be viewed by others.
- The Certificate of Completion will be stored at Mastercam University under your unique student ID number. It remains available for you to use as proof of work completed and grades received.
- You must also register at a regional college to receive college credit for the successful completion of this course.