

## Lathe Design and Toolpaths

### Course Description

The Mastercam University® Lathe Design & Toolpaths course takes Mastercam students from square one to successfully programming parts to be machined on a CNC lathe. As you program parts you learn to store your work and knowledge. This approach helps you to save time by building on proven techniques and toolpaths. The first module covers how to create wireframe and solid lathe specific geometry in Mastercam. The second module shows how to set up a lathe file from datum, to managing toolpath libraries, to verifying toolpaths. The third module provides extensive coverage of lathe toolpaths.

### Course Objectives

Upon completion, you should be able to demonstrate:

#### Geometry

- Use of levels, colors, groups
- Lathe construction planes
- Use of 2D and 3D construction methods
- Modification of current geometry (Trim, Fillet, Color, Level, Group, and Attributes)
- Geometry selection (pre/post selection)
- Creation of curves on solids
- Diameter/Radius part creation
- Geometry transformation (Scale, Rotate, etc.)

#### Solids

- Extrude, Primitive, Fillet, Revolve

#### Toolpath

- Efficient toolpath creation
- Use of holding in example parts
- Create a tool definition from scratch
- Depth of cut and feed rate based on tool and materials
- Appropriate toolpath operation for cutting application
- Saving custom tools to a level
- Stock setup
- Setup sheet creation including documentation of cutting with order of cuts
- Internal and external operations for all Mastercam Lathe toolpaths
- Importing and exporting operations
- Toolpath group creation

- Machine group creation
- Backplot
- Quick Verify
- Verify section
- STL file creation and STL compare
- Plunge Turn toolpath

#### Live Toolpaths

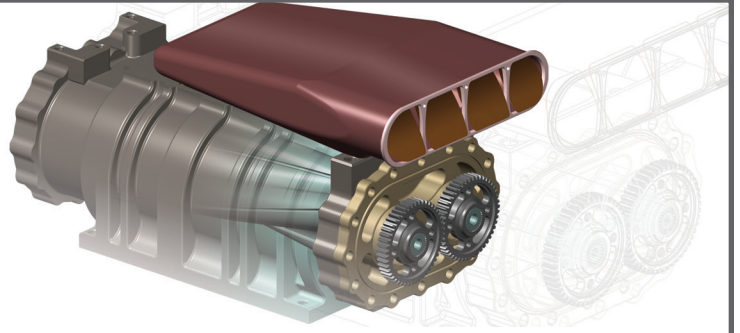
- G-axis toolpath overview
- G-axis Face Mill
- G-axis Face Drill
- G-axis Cross Milling
- Y-axis Contour

#### Operations Manager

- Configuration
- Geometry cut and paste
- Use of display settings
- Use of tool offset registry settings
- Use of maximum RPM and feed rate
- Number of tools in the turret
- Understanding of RPM/FPR

#### Strongly Recommended Prerequisites

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



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### Materials

The Lathe Design & Toolpaths course requires:

- High speed internet connection.
- Computer that meets the Mastercam System Requirements.
- Mastercam Demo/Home Learning Edition, 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 30 hours. 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 multiple choice assessments for both the beginning and end of the design and toolpath sections of the course. You will receive a Certificate of Completion (PDF format) upon completion of the posttest, which will display the posttest grade. Students should have at least 30-45 minutes to complete the multiple choice question tests. These are supplied in advance to review.

### 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 participating colleges to receive college credit for the successful completion of this course.