

## ***MasterCAM X3 For Milling and Turning Center Application***

This training program has been created to advance experienced CNC machinists and operators in the use of NC programming and CAD/CAM technology to develop NC code for milling and turning centers. This is not an entry-level program for beginners. Participants must be able to demonstrate proficiency in blueprint reading, shop mathematics and computer skills using Microsoft Windows®. Participants must have at least 1 year of full-time experience in setup and operation of CNC machining centers.

Our MasterCAM training program has been tailored using Mastercam X3®, one of the most popular CAD/CAM software packages for creating toolpaths for turning and milling centers. The participants will develop skills in job planning, NC programming, CAD drawing, and preparing toolpaths from 2-D and 3-D CAD models for both mill and lathe applications.

### **CNC Milling and Turning Application**

- CNC milling and turning processes and functions
- Cutting tool materials and selection
- CNC machine tool systems and design
- Machine axes designation and direction conventions
- CNC positioning systems
- Selecting and using cutter inserts and holders
- Understanding and calculating speeds and feeds
- Developing a CNC machining operations plan from engineering drawings and specifications
- NC code and programming functions
- Advanced NC programming technique using canned cycles, positioning, and sub programming
- NC programming at the machine using MDI
- CNC milling and turning machine controller operations and program loading
- Application project

# ***Mastercam.***

### **CAD/CAM Programming Using Mastercam X3®**

- Strategy for using CAD/CAM on-the-job
- Working in the CAD/CAM software environment
- Toolpath and operations planning in the CAD/CAM environment
- Developing 2-D and 3-D CAD geometry
- Preparing contouring, drilling, and pocketing toolpaths for CNC milling applications
- Strategy and technique for entry and exit leads and advanced pocketing
- Preparing OD, ID, and threading toolpaths for turning applications
- 3-D toolpath development and editing
- Toolpath posting theory and application to specific CNC milling and turning centers
- Running the 1<sup>st</sup> article and toolpath editing techniques
- Application project

