



MAKINO

Makino Technical Training

Makino is pleased to present its CNC Operations, Maintenance, and Programming class syllabus.

- Makino technical courses are designed specifically for Operators, Programmers, and Maintenance personnel who would like to improve their skills and knowledge of various Makino products.

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Please indicate if you would like this class presented onsite for large groups!

TO REGISTER: call 1-888-Makino4 and ask for the Training Department or please complete the [Enrollment Form](#) located at www.makino.com.



MAKINO

Makino Technical Training

Makino's Mission Statement

SUCCESS THROUGH INTEGRITY AND INNOVATION

Our goal is to provide products and services which exceed customer expectations. This is accomplished through INTEGRITY and a commitment to excellence.

Each employee's talent and dedication are the means by which we achieve this goal. Our collective efforts must focus on INNOVATION and continuous improvement to meet the advancing needs of our customers.

We, the employees of Makino, measure success by the satisfaction of those who produce, sell, and use our products. We achieve SUCCESS through INTEGRITY AND INNOVATION.

Instructors

Makino's course instructors are committed personally and professionally to the quality of the training atmosphere. Our technical instructors are highly experienced in the daily operations of Makino's products, from the 1 Series to the MAG machines. Most importantly, we are committed to improving the understanding and confidence of each student to ensure they are better able to perform their jobs.



MAKINO

Makino Technical Training

Pro 3 Operations with Fanuc 16i/18i Control – 3 Days For 1 Series Machining Centers

Provide Operators with a working knowledge of the terminology, procedures, codes, formats, and the ability to use all control functions necessary to operate the machine in a safe and efficient manner.

Description

This competency-based course provides an overview of all machine safety features and procedures, operator control stations, and machine components and functions. Detailed instruction is presented on the control, including its functions and screens, setup procedures, and minor recovery operations. The Fanuc 16i/18i control (in Makino Pro 3 configuration) is featured with heavy emphasis on the typical Horizontal Machining Center (HMC) application. Some discussion and/or activity are also directed at the particular models and options of customer machinery for each student where possible. MMC programming and functions are not covered.

Prerequisites

- Ability to identify dimensions from part drawings and work with coordinate systems.
- Familiarity with basic fundamentals of metal cutting and machine tools.
- Prior completion of Makino's "Machine Tool Basics" class, or having equivalent work experience, is strongly recommended.

Contents

- Explanation of Basic Safety Functions
- Machine Components and Their Functions
- Introduction to the CNC and PMC Control Functions
- Coordinate System
- Manual and Automatic CNC Functions
- PMC Functions
- Machine Setup
- Minor Alarm Recovery and

Schedule 2010 \$395/person/day

2010 Schedule

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MAKINO

Makino CNC Technical Training

Pro 5 Operations with Fanuc 310i Control – 3 Days

For 1 Series Machining Centers

Provide Operators with a working knowledge of the terminology, procedures, codes, formats, and the ability to use all control functions necessary to operate the machine in a safe and efficient manner.

Description

This competency-based course provides an overview of all machine safety features and procedures, operator control stations, and machine components and functions. Detailed instruction is presented on the control, including its functions and screens, setup procedures, and minor recovery operations. The Fanuc 310i control (in Makino Pro 5 configuration) is featured with heavy emphasis on the typical Horizontal Machining Center (HMC) application. Some discussion and/or activity are also directed at the particular models and options of customer machinery for each student where possible. MMC programming and functions are not covered.

Prerequisites

- Ability to identify dimensions from part drawings and work with coordinate systems.
- Familiarity with basic fundamentals of metal cutting and machine tools.

Contents

- Explanation of Basic Safety Functions
- Machine Components and Their Functions
- Basic Pro 5 Screen Navigation
- Coordinate Systems
- Setting Work Coordinate Offsets
- Tools and Tool Offsets
- Program Management and Editing
- Malfunction Prevention and Program Recovery
- Tool Monitoring

Schedule 2010 - \$395/person/day

[2010 Schedule](#)
[Seating Availability](#)

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MAKINO

Makino CNC Technical Training

MMC/Systems Control Operations - B2/A3/MAS Software – 3 Days

Provide Operators/Programmers with the ability to effectively program and operate the MMC System Software in Automatic System Mode and Manual Mode.

Description

This course provides information necessary for performing basic operation and programming techniques for the MMC System Software. The function, location, and principle of operation for the major components of the MMC System Software are covered. Emphasis is placed on software data entry and system operation. The student will learn through practical experience by setting up an automatic operation using simulators. Students will also set up and troubleshoot individual learning tasks throughout the class.

Prerequisites

- Familiarity with the basic fundamentals of machining and machine tools as related to MMC systems.

Contents

- Introduction to the MMC System Software
- Safety Precautions and Features
- Basic Troubleshooting on the MMC System Software
- Description of the Major Units, Their Principles of Operations, and Specifications
- Programming the System Software
 - Part Data, Pallet data
 - Fixture Data, Tool Data, Order Data
 - Hands-On Operation

Schedule 2010 - \$395/person/day

2010 Schedule

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MAKINO

Makino Technical Training

Manual Part Programming – 4-1/2 Days

Provide a working knowledge of the codes, format, and process necessary to write part programs in CNC language for Makino machines.

Description

This course provides training to help develop part programs for use on Makino Machining Centers. The main focus of this course is Part Boundary Programming (using print dimensions). This includes explanation of the formats and codes used to produce a program on a Makino machine. Fanuc's Custom Macro Option (standard on most of Makino's MCs), a powerful BASIC-type enhancement to CNC programming, is introduced in the last hours of the course.

Makino's Tool Monitor Function is also covered in this class, including:

- Establishing amperages on individual tools, beyond which they may not operate.
- Applying Adaptive Control as tool dulls, or if material becomes inconsistent.
- The ability to implement spare tools after the programmed tool's life expires.
- Automatic Work Change on alarmed tool, if machine has Random Pallet Option.

Prerequisites

- Ability to read part prints and use algebra, geometry, and right angle trigonometry.
- A working knowledge of machine ability, tool selection, and applications needed to calculate speeds and feeds.
- Familiarity with proper setup procedures including the correct application of work-holding devices.
- A knowledge of chucks, vises, and fixturing is also helpful.

Contents

- Introduction to Programming
- Outline of Machine
- Control Specifications and Options
- Tooling
- Preparation for Part Programming
- Composition of a Program
- Canned Cycles
- Speed, Feed, Tool, and Indexing Table Codes
- M Codes, G Codes
- Tool Radius/Diameter and Length Compensation
- Work Coordinate Systems
- Linear & Circular Interpolation
- Rotary Axis Programming
- Subroutines
- Examples
- Tool Monitoring Functions
- Custom Macro Introduction
- Mathematical Functions

Schedule 2010 - \$395/person/day

2010 Schedule
[Seating Availability](#)

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MAKINO

Makino Technical Training

Macro Programming – 2-1/2 Days

Provide an understanding and working knowledge of macro programming techniques and capabilities and allow the student to become a more efficient and proficient programmer, reducing their part programming time.

Description

This course is designed to enable the Programmer to use the control's powerful macro programming feature on milling machines with Fanuc controls. Students will learn to write repetitive machining cycles (i.e., variably decreasing peck drilling, special pocket milling, tool/workpiece/fixture interference checks). Students will understand the components of the macro body and the meaning of the macro call command variables. Past students have programmed entire families of parts with one master program utilizing macros.

Contents

- User Macro Introduction
- Composition of Macro Command
- Local, Common and System Variables
- Arithmetic Commands
- Control Commands
- Registration of Macro Body
- Call of Macro
- Words Used in Macro
- Writing Alarms
- Shifting Program Zero Points
- Programming Measuring Zero Points

Prerequisites

- Previous attendance of Makino's Manual Part Programming course or at least 3 months programming experience on a Fanuc/GE Fanuc control.
- Ability to read part prints and use algebra, geometry, and right angle trigonometry.
- A working knowledge of machine ability, tool selection, and applications needed to calculate speeds and feeds.
- Familiarity with proper setup procedures including the correct application of work-holding devices.

Schedule 2010 - \$395/person/day

[2010 Schedule](#)
[Seating Availability](#)

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MAKINO

Makino Technical Training

Automatic Tool Length Measuring/Automatic Measuring Systems Class – 2-1/2 Days

Enable Operators and Programmers to understand and effectively use the optional Automatic Measuring Systems to enhance the efficiency and quality of the machining process.

Description

This course exposes Operators and Programmers to the optional Automatic Measuring Systems on milling machines with a Fanuc/GE Fanuc/Makino control. A working knowledge of workpiece and tool measuring features and a review of support materials is provided.

Contents

- Automatic Work Measuring (Probe)
- Measured Data Output
- Automatic Tool Length Measurement and Broken Tool Sensor Programs

Prerequisites

- Previous attendance of Makino's Manual Part Programming course or at least 3 months programming experience on a Fanuc/GE Fanuc control.
- Ability to read part prints and use algebra, geometry, and right angle trigonometry.
- A working knowledge of machine ability, tool selection, and applications needed to calculate speeds and feeds.
- Familiarity with proper setup procedures including the correct application of work-holding devices.

Schedule 2010 - \$395/person/day

2010 Schedule

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MAKINO

Makino CNC Technical Training

a51/a61 HMC Maintenance with Pro 3 Control – 4-1/2 Days

Provide Maintenance personnel with the ability to effectively determine a machine fault and its probable causes. Perform basic electrical and mechanical adjustments as well as general and periodic maintenance procedures. Practice machine recovery.

Description

This course provides the information necessary to perform basic machine maintenance. The function, location, and principle of operation for the major machine units are described. Emphasis is placed on troubleshooting a machine fault, by use of the various diagnostic functions available on the machine tool and the Pro 3 control.

The course consists of classroom sessions and hands-on training.

Prerequisites

- Identify dimensions from part drawings and work with coordinate systems.
- Ability to read blueprints, hydraulic diagrams, and electrical schematics.
- Understanding of mechanical systems and basic electricity.
- Familiarity with the tools used to check and repair mechanical, hydraulic, and electrical systems.

Contents

- Introduction to the Machine
- Safety Precautions and Procedures
- Troubleshooting Via Machine Side and Control Side Diagnostics
- Description of the Major Units, Their Principles of Operation, and Specifications
 - Spindle Head
 - Feed Axis Unit
 - Automatic Tool Changer (ATC)
 - B Axis
 - Automatic Pallet Changer (APC)
- Hands-On Activities
- ATC, APC, and Magazine Recovery

Schedule 2010 - \$395/person/day

2010 Schedule

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MAKINO

Makino CNC Technical Training

a71/a81 HMC Maintenance with Pro 3 Control – 4-1/2 Days

Provide Maintenance personnel with the ability to effectively determine a machine fault and its probable causes. Perform basic electrical and mechanical adjustments as well as general and periodic maintenance procedures. Practice machine recovery.

Description

This course provides the information necessary to perform basic machine maintenance. The function, location, and principle of operation for the major machine units are described. Emphasis is placed on troubleshooting a machine fault, by use of the various diagnostic functions available on the machine tool and the Pro 3 control.

The course consists of classroom sessions and hands-on training.

Prerequisites

- Identify dimensions from part drawings and work with coordinate systems.
- Ability to read blueprints, hydraulic diagrams, and electrical schematics.
- Understanding of mechanical systems and basic electricity.
- Familiarity with the tools used to check and repair mechanical, hydraulic, and electrical systems.

Contents

- Introduction to the Machine
- Safety Precautions and Procedures
- Troubleshooting Via Machine Side and Control Side Diagnostics
- Description of the Major Units, Their Principles of Operation, and Specifications
 - Spindle Head
 - Feed Axis Unit
 - Automatic Tool Changer (ATC)
 - B Axis
 - Automatic Pallet Changer (APC)
- Hands-On Activities
- ATC, APC, and Magazine Recovery

Schedule 2010 - \$395/person/day

2010 Schedule

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MAKINO

Makino CNC Technical Training

a51/a61 HMC Maintenance with Pro 5 Control – 4-1/2 Days

Provide Maintenance personnel with the ability to effectively determine a machine fault and its probable causes. Perform basic electrical and mechanical adjustments as well as general and periodic maintenance procedures.

Description

This course provides the information necessary to perform basic machine maintenance. The function, location, and principle of operation for the major machine units are described. Emphasis is placed on troubleshooting a machine fault, by use of the various diagnostic functions available on the machine tool and the Pro 5 control.

The course consists of classroom sessions and hands-on training.

Prerequisites

- Identify dimensions from part drawings and work with coordinate systems.
- Ability to read blueprints, hydraulic diagrams, and electrical schematics.
- Understanding of mechanical systems and basic electricity.
- Familiarity with the tools used to check and repair mechanical, hydraulic, and electrical systems.

Contents

- Introduction to the Machine
- Safety Precautions and Procedures
- Troubleshooting Via Machine Side and Control Side Diagnostics
- Description of the Major Units, Their Principles of Operation, and Specifications
 - Spindle Head
 - Feed Axis Unit
 - Automatic Tool Changer (ATC)
 - B Axis
 - Automatic Pallet Changer (APC)
- Hands-On Activities
- ATC, APC, and Magazine Recovery

Schedule 2010 - \$395/person/day

2010 Schedule
[Seating Availability](#)

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MAKINO

Makino Technical Training

a71/a81/a82 HMC Maintenance with Pro 5 Control – 4-1/2 Days

Provide Maintenance personnel with the ability to effectively determine a machine fault and its probable causes. Perform basic electrical and mechanical adjustments as well as general and periodic maintenance procedures.

Description

This course provides the information necessary to perform basic machine maintenance. The function, location, and principle of operation for the major machine units are described. Emphasis is placed on troubleshooting a machine fault, by use of the various diagnostic functions available on the machine tool and the Pro 5 control.

The course consists of classroom sessions and hands-on training.

Prerequisites

- Identify dimensions from part drawings and work with coordinate systems.
- Ability to read blueprints, hydraulic diagrams, and electrical schematics.
- Understanding of mechanical systems and basic electricity.
- Familiarity with the tools used to check and repair mechanical, hydraulic, and electrical systems.

Contents

- Introduction to the Machine
- Safety Precautions and Procedures
- Troubleshooting Via Machine Side and Control Side Diagnostics
- Description of the Major Units, Their Principles of Operation, and Specifications
 - Spindle Head
 - Feed Axis Unit
 - Automatic Tool Changer (ATC)
 - B Axis
 - Automatic Pallet Changer (APC)
- Hands-On Activities
- ATC, APC, and Magazine Recovery Procedures

Schedule 2010 - \$395/person/day

2010 Schedule
[Seating Availability](#)

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MAKINO

Makino Technical Training

a92 HMC Maintenance with Pro 5 Control – 4-1/2 Days

Provide Maintenance personnel with the ability to effectively determine a machine fault and its probable causes. Perform basic electrical and mechanical adjustments as well as general and periodic maintenance procedures.

Description

This course provides the information necessary to perform basic machine maintenance. The function, location, and principle of operation for the major machine units are described. Emphasis is placed on troubleshooting a machine fault, by use of the various diagnostic functions available on the machine tool and the Pro 5 control.

The course consists of classroom sessions and hands-on training.

Prerequisites

- Identify dimensions from part drawings and work with coordinate systems.
- Ability to read blueprints, hydraulic diagrams, and electrical schematics.
- Understanding of mechanical systems and basic electricity.
- Familiarity with the tools used to check and repair mechanical, hydraulic, and electrical systems.

Contents

- Introduction to the Machine
- Safety Precautions and Procedures
- Troubleshooting Via Machine Side and Control Side Diagnostics
- Description of the Major Units, Their Principles of Operation, and Specifications
 - Spindle Head
 - Feed Axis Unit
 - Automatic Tool Changer (ATC)
 - B Axis
 - Automatic Pallet Changer (APC)
- Hands-On Activities
- ATC, APC, and Magazine Recovery Procedures

Schedule 2010 - \$395/person/day

2010 Schedule
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MAKINO

Makino CNC Technical Training

a51/a61 HMC Advanced Maintenance with Pro 3 Control – 4-1/2 Days

Provide Maintenance personnel with the ability to effectively repair machine faults and their probable causes. Perform tear-down and rebuild of major machine components.

RESTRICTED COURSE: Non-US Citizens may require a export license to attend. Please contact Makino International Trade and Customs Specialists at 1-888-MAKINO4 (625-4664) with questions.

Description

This course provides the information necessary to perform advanced machine maintenance. The function, location, and principle of operation for the major machine units are described. Emphasis is placed on tear-down and rebuild of the major machine units.

The course consists of classroom sessions and hands-on training.

Contents

- Safety Precautions and Procedures
- Mechanisms and Adjustment/
Replacement Procedures
- Machine Controller
- Special Tools/Jigs

Prerequisites

- Minimum 3 years working on a51/a61 in a maintenance capacity OR attendance in a51/a61 Maintenance training.
- Ability to use indicator and other precision-measuring equipment.
- Identify dimensions from part drawings; work with coordinate systems.
- Read blueprints, hydraulic diagrams, and electric schematics.
- Understand mechanical systems/basic electricity.
- Familiarity with machining/machine tools required.

Please indicate if you would like this class presented onsite for large groups!

Schedule 2010 - \$470/person/day

2010 Schedule

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MAKINO

Makino CNC Technical Training

a71/a81 HMC Advanced Maintenance with Pro 3 Control – 4-1/2 Days

Provide Maintenance personnel with the ability to effectively repair machine faults and their probable causes. Perform tear-down and rebuild of major machine components.

RESTRICTED COURSE: Non-US Citizens may require a export license to attend. Please contact Makino International Trade and Customs Specialists at 1-888-MAKINO4 (625-4664) with questions.

Description

This course provides the information necessary to perform advanced machine maintenance. The function, location, and principle of operation for the major machine units are described. Emphasis is placed on tear-down and rebuild of the major machine units.

The course consists of classroom sessions and hands-on training.

Contents

- Safety Precautions and Procedures
- Mechanisms and Adjustment/
Replacement Procedures
- Machine Controller
- Special Tools/Jigs

Prerequisites

- Minimum 3 years working on a71/a81 in a maintenance capacity OR attendance in a71/a81 Maintenance training.
- Ability to use indicator and other precision-measuring equipment.
- Identify dimensions from part drawings; work with coordinate systems.
- Read blueprints, hydraulic diagrams, and electric schematics.
- Understand mechanical systems/basic electricity.
- Familiarity with machining/machine tools required.

Please indicate if you would like this class presented onsite for large groups!

Schedule 2010 - \$470/person/day

2010 Schedule

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MAKINO

Makino CNC Technical Training

a51/a61 HMC Advanced Maintenance with Pro 5 Control – 4-1/2 Days

Provide Maintenance personnel with the ability to effectively repair machine faults and their probable causes. Perform tear-down and rebuild of major machine components.

RESTRICTED COURSE: Non-US Citizens may require a export license to attend. Please contact Makino International Trade and Customs Specialists at 1-888-MAKINO4 (625-4664) with questions.

Description

This course provides the information necessary to perform advanced machine maintenance. The function, location, and principle of operation for the major machine units are described. Emphasis is placed on tear-down and rebuild of the major machine units.

The course consists of classroom sessions and hands-on training.

Contents

- Safety Precautions and Procedures
- Mechanisms and Adjustment/
Replacement Procedures
- Machine Controller
- Special Tools/Jigs

Prerequisites

- Minimum 3 years working on a51/a61 in a maintenance capacity OR attendance in a51/a61 Maintenance training.
- Ability to use indicator and other precision-measuring equipment.
- Identify dimensions from part drawings; work with coordinate systems.
- Read blueprints, hydraulic diagrams, and electric schematics.
- Understand mechanical systems/basic electricity.
- Familiarity with machining/machine tools required.

Schedule 2010 - \$470/person/day

2010 Schedule
[Seating Availability](#)

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MAKINO

Makino CNC Technical Training

a71/a81 HMC Advanced Maintenance with Pro 5 Control – 4-1/2 Days

Provide Maintenance personnel with the ability to effectively repair machine faults and their probable causes. Perform tear-down and rebuild of major machine components.

RESTRICTED COURSE: Non-US Citizens may require a export license to attend. Please contact Makino International Trade and Customs Specialists at 1-888-MAKINO4 (625-4664) with questions.

Description

This course provides the information necessary to perform advanced machine maintenance. The function, location, and principle of operation for the major machine units are described. Emphasis is placed on tear-down and rebuild of the major machine units.

The course consists of classroom sessions and hands-on training.

Contents

- Safety Precautions and Procedures
- Mechanisms and Adjustment/
Replacement Procedures
- Machine Controller
- Special Tools/Jigs

Prerequisites

- Minimum 3 years working on a71/a81 in a maintenance capacity OR attendance in a71/a81 Maintenance training.
- Ability to use indicator and other precision-measuring equipment.
- Identify dimensions from part drawings; work with coordinate systems.
- Read blueprints, hydraulic diagrams, and electric schematics.
- Understand mechanical systems/basic electricity.
- Familiarity with machining/machine tools required.

Please indicate if you would like this class presented onsite for large groups!

Schedule 2010 - \$470/person/day

2010 Schedule
[Seating Availability](#)

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MAKINO

Makino Technical Training

HMC Maintenance with Pro 3 Control – 4-1/2 Days

(For A55D through A100E)

Provide Maintenance personnel with the ability to effectively determine a machine fault and its probable causes. Perform basic electrical and mechanical adjustments as well as general and periodic maintenance procedures. Perform machine recovery.

Description

This course provides the information necessary to perform basic machine maintenance. The function, location, and principle of operation for the major machine units are described. Emphasis is placed on troubleshooting a machine fault, by use of the various diagnostic functions available on the machine tool and the CNC control.

The course consists of classroom sessions and hands-on training.

Prerequisites

- Identify dimensions from part drawings and work with coordinate systems.
- Ability to read blueprints, hydraulic diagrams, and electrical schematics.
- Understanding of mechanical systems and basic electricity.
- Familiarity with the tools used to check and repair mechanical, hydraulic, and electrical systems.

Contents

- Introduction to the Machine
- Safety Precautions and Procedures
- Troubleshooting Via Machine Side and Control Side Diagnostics
- Description of the Major Units, Their Principles of Operation, and Specifications
 - Spindle Head
 - Feed Axis Unit
 - Automatic Tool Changer (ATC)
 - B Axis
 - Automatic Pallet Changer (APC)
- Hands-On Activities
- ATC, APC, and Magazine Recovery Procedures

Schedule 2010 - \$395/person/day

2010 Schedule

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Note: [On line registration for class enrollment is mandatory to attend any Makino public training held at any of our facilities.](#)

Please indicate if you would like this class presented onsite for large groups!

TO REGISTER: call 1-888-Makino4 and ask for the Training Department or please complete the [Enrollment Form](#) located at www.makino.com.



MAKINO

Makino Technical Training

A55D/A66 Advanced Maintenance – 4-1/2 Days

Provide Maintenance personnel with the ability to effectively repair machine faults and their probable causes. Perform tear-down and rebuild of major machine components.

RESTRICTED COURSE: Non-US Citizens may require a export license to attend. Please contact Makino International Trade and Customs Specialists at 1-888-MAKINO4 (625-4664) with questions.

Description

This course provides the information necessary to perform advanced machine maintenance. The function, location, and principle of operation for the major machine units are described. Emphasis is placed on tear-down and rebuild of the major machine units.

The course consists of classroom sessions and hands-on training.

Prerequisites

- Minimum 3 years working on A55D/A66 in a maintenance capacity OR attendance in A55D/A66 Maintenance training.
- Ability to use indicator and other precision-measuring equipment.
- Identify dimensions from part drawings; work with coordinate systems.
- Read blueprints, hydraulic diagrams, and electric schematics.
- Understand mechanical systems/basic electricity.
- Familiarity with machining/machine tools required.

Please indicate if you would like this class presented onsite for large groups!

Contents

- Introduction to Makino
- Safety Precautions and Features
- Major Machine Assemblies, Theory of Operation, Disassemble and Reassemble
 - Index Table
 - Rotary Table
 - Drawbar
 - Feed Axis
 - ATC Arm
 - ATC Magazine
 - APC (Pallet Changer)

Schedule 2010 - \$470/person/day

2010 Schedule

[This class is scheduled on an as needed basis. Please Call 1-888-MAKINO4 and ask for the Training Project Leader for information.](#)

Note: On line registration for class enrollment is mandatory to attend any Makino public training held at any of our facilities.

TO REGISTER: call 1-888-Makino4 and ask for the Training Department or please complete the [Enrollment Form](#) located at www.makino.com.



MAKINO

Makino Technical Training

MAG3 Maintenance – 4-1/2 Days

Provide Maintenance personnel with the ability to effectively determine a machine fault and its probable causes. Perform basic electrical and mechanical adjustments as well as general and periodic maintenance procedures.

Description

This course provides the information necessary to perform basic machine maintenance. The function, location, and principle of operation for the major machine units are described. Emphasis is placed on troubleshooting a machine fault, by use of the various diagnostic functions available on the machine tool and the CNC control.

The course consists of classroom sessions and hands-on training.

Prerequisites

- Identify dimensions from part drawings and work with coordinate systems.
- Ability to read blueprints, hydraulic diagrams, and electrical schematics.
- Understanding of mechanical systems and basic electricity.
- Familiarity with the tools used to check and repair mechanical, hydraulic, and electrical systems.

Contents

- Introduction to Makino
- Safety Precautions and Features
- Troubleshooting via Machine Side and Control Side Diagnostics
- Description of the Major Units, Their Principles of Operation, and Specifications
 - Spindle Head
 - Feed Axis
 - ATC
 - ATC Magazine
 - Oil/Air Systems
- Hands-On Activities
- ATC, APC, and Magazine Recovery Procedures

Schedule 2010 - \$395/person/day

2010 Schedule
[Seating Availability](#)

Note: On line registration for class enrollment is mandatory to attend any Makino public training held at any of our facilities.

Please indicate if you would like this class presented onsite for large groups!

TO REGISTER: call 1-888-Makino4 and ask for the Training Department or please complete the [Enrollment Form](#) located at www.makino.com.



MAKINO

Makino Technical Training

MMC (OPC1, MMC2) System Hardware Maintenance – 2 Days

Provide Maintenance personnel with the ability to effectively determine an MMC fault and its probable causes. Perform basic electrical and mechanical adjustments and general periodic maintenance procedures.

Description

This course provides the information necessary to perform basic MMC maintenance. The function, location, and principle of operation of the major components for the MMC are taught. Emphasis is placed on troubleshooting both electrical and mechanical problems using various diagnostics on the MMC controller.

Prerequisites

- Read blueprints, hydraulic diagrams, and electric schematics.
- Understand mechanical systems/basic electricity.
- Familiarity with machining/machine tools required.

Contents

- Introduction to the MMC
- Safety Precautions and Features
- Troubleshooting Via the DM and Vehicle Controller Diagnostics
- Description of the Major Units, Their Principles of Operation, and Specifications
 - Mechanical
 - Pallet Transport Vehicle
 - Work Setting Station
 - Rails, Machine Pallet Buffer, and Pallet Stockers
 - Electrical
 - Distribution Manager (DM)
 - Vehicle Controller
 - Servo Drives
 - Machine-MMC Interface

Schedule 2010 - \$395/person/day

2010 Schedule

[This class is scheduled on an as needed basis. Please Call 1-888-MAKINO4 and ask for the Training Project Leader for information.](#)

Note: [On line registration for class enrollment is mandatory to attend any Makino public training held at any of our facilities.](#)

Please indicate if you would like this class presented onsite for large groups!

TO REGISTER: call 1-888-Makino4 and ask for the Training Department or please complete the [Enrollment Form](#) located at www.makino.com.



MAKINO

Makino Technical Training

Wire EDM – DUO – Series Operations with MGW-S Control – 4-1/2

Session A: Provide an introductory survey of the wire EDM machine tool, the control and its features, maintenance and upkeep procedures, part programming, and processing of an actual EDM application.

Session B: Review of maintenance procedures, detailed discussion on control features, taper and 4-axis programming requirements, Makino EDM cutting parameters and their effect on the process and result, discussion of typical real life applications.

Description

This 2-part course provides full training on the operation, programming, and in-depth maintenance of wire EDM machines using the MGW-S control, applicable to the DUO, SP,U86, U..i, and U..j series wire EDM machines.

Session A begins at 8:30 on Monday and is recommended for all new users of Makino WEDM machines and operators needing a refresher course on the control and especially maintenance procedures. **Session B** begins at 8:30 on Wednesday and is recommended for Session 1 students and operators with prior experience using the MGW-S control.

The course consists of a combination of classroom lecture and hands-on use of the machine. Student active participation is encouraged.

Contents

Session A:

- Overview of the machine control
- Detailed machine maintenance procedures
- Work coordinate systems and usage
- How to write incremental and absolute part programs
- How to get programs in and out of the machine
- Job setup and cutting an actual job

Session B:

- Details of the machine control
- Review of common operator maintenance items
- Job pre-checks and time estimation
- Part pickup and location setting techniques
- Taper and 4-axis program requirements
- Setting up the machine in preparation for a cut
- Cutting technology and effects of various elements
- What can go wrong and why
- Discussion of CAM software packages

Prerequisites

- Ability to read part drawings.

Session A

- No prior Makino wire EDM experience.

Session B

- Prior experience on Makino wire EDM. Familiarity with G/M-code programming.

Schedule 2010 - \$395/person/day

[2010 Schedule](#)
[Seating Availability](#)

[Note: On line registration for class enrollment is mandatory to attend any Makino public training held at any of our facilities.](#)

Please indicate if you would like this class presented onsite for large groups!

TO REGISTER: call 1-888-Makino4 and ask for the Training Department or please complete the [Enrollment Form](#) located at www.makino.com.



MAKINO

Makino Technical Training

EDM RAM Operations with MGH Control – 4-1/2 Days

Enable the Operator/Programmer to develop a program, choose the proper cutting (burning) conditions, and use the control functions to obtain unattended and/or semi-unattended operations.

Description

This course provides a thorough understanding of EDM RAM techniques and technologies, along with the CNC capabilities and MODEL PLAN conversational programming of the MGH control.

Contents

- Introduction to CNC EDM
- Main Machine Components
- Basic Functions for Getting Started
- Modes of Operation
- Introduction to Programming
- Manual and Automatic Workpiece Pickups
- Machine Cutting Parameters
- Stored E-Codes and Model Data
- G and M Codes
- CNC Functions
- Machining Methods Selection
- Pattern Machining Orbit Selection
- Graphics Functions
- Options Functions
- Basic Maintenance

Prerequisites

- Background in tool and die and/or parts manufacturing.
- Minimum of 2 weeks hands-on experience with machine and a basic understanding of its functions.

Schedule 2010- \$395/person/day

[2010 Schedule](#)
[Seating Availability](#)

[Note: On line registration for class enrollment is mandatory to attend any Makino public training held at any of our facilities.](#)

Please indicate if you would like this class presented onsite for large groups!

TO REGISTER: call 1-888-Makino4 and ask for the Training Department or please complete the [Enrollment Form](#) located at www.makino.com.



MAKINO

Makino Technical Training

Wire EDM Operations with Pre-1999 Controls

Provide a working knowledge of necessary codes, format, and steps needed to write part programs in CNC language, enter them into the machine, and accomplish part cutting. Provide guidance to experienced Wire EDM operators about the available features as well as accessing those features. Possible part cutting on machine. Discussion of application techniques and common CAM (computer-aided manufacturing) software, and how those packages relate to this control.

Description

This course gives a full description of Wire EDM techniques and CNC contour part programming as they pertain to Makino's pre-1999 controls/EDM generators. The student will learn basic Wire EDM programming, screen navigation, and explanation of machine cutting conditions. The student will also gain an understanding of how to select machine cutting conditions and application toward different material types and thicknesses. The student will learn how to program a punch shape, a die shape, a circle, and use of taper function, as well as setting offsets.

Prerequisites

- Ability to use right angle trigonometry and read part drawings.

Contents

- Power On/Off Procedure
- Work Coordinate Use
- Explanation of Basic Programming Codes
- How to Write Incremental and Absolute Programs
- How to Enter the Program Into the Machine
- Setting the Machine and Executing Program
- Part Pickup and Location Setting Techniques
- Setting Machine Properly for Cutting
- Techniques for Getting Program Into Control
- Checking Estimated Cutting Time Prior to Cutting
- Common Operator Maintenance Items
- Application Techniques, Remaining Functions
- Limited Part Cutting as Needed
- Discussion of CAM Software Packages

Schedule 2010 - \$395/person/day

2010 Schedule

[This class is scheduled on an as needed basis. Please Call 1-888-MAKINO4 and ask for the Training Project Leader for information.](#)

Note: [On line registration for class enrollment is mandatory to attend any Makino public training held at any of our facilities.](#)

Please indicate if you would like this class presented onsite for large groups!

TO REGISTER: call 1-888-Makino4 and ask for the Training Department or please complete the [Enrollment Form](#) located at www.makino.com.



MAKINO

Makino Technical Training

EDM RAM Operations with Pre-1999 Controls

Enable the Operator/Programmer to develop a program, choose the proper cutting (burning) conditions, and use the control functions to obtain unattended and/or semi-unattended operations.

Description

This course provides a thorough understanding of EDM RAM techniques and technologies, along with the CNC capabilities and MODEL PLAN conversational programming as they pertain to Makino's pre-1999 controls/EDM generators.

Prerequisites

- Background in tool and die and/or parts manufacturing.
- Minimum of 2 weeks hands-on experience with machine and a basic understanding of its functions.

Contents

- Introduction to CNC EDM
- Main Machine Components
- Basic Functions for Getting Started
- Modes of Operation
- Introduction to Programming
- Manual and Automatic Workpiece Pickups
- Machine Cutting Parameters
- Stored E-Codes and Model Data
- G and M Codes
- CNC Functions
- Machining Methods Selection
- Pattern Machining Orbit Selection
- Graphics Functions
- Options Functions
- Basic Maintenance

Schedule 2010 - \$395/person/day

2010 Schedule

[This class is scheduled on an as needed basis. Please Call 1-888-MAKINO4 and ask for the Training Project Leader for information.](#)

[Note: On line registration for class enrollment is mandatory to attend any Makino public training held at any of our facilities.](#)

Please indicate if you would like this class presented onsite for large groups!

TO REGISTER: call 1-888-Makino4 and ask for the Training Department or please complete the [Enrollment Form](#) located at www.makino.com.



MAKINO

Makino Technical Training

High Performance Machining for Vertical machines – 4.5 Days

Provide Operators and Programmers with necessary knowledge and materials to make appropriate decisions related to tooling and programming part geometry which support high-performance machining applications. Provide 2 days basic Pro 5 Control operations. Provide half day of Tool Measure probing operations.

Description

Take part in 1, 2 or all 3 classes for just one training credit.

When filling out the student registration form, in the comments sections note which training events the student will participate in.

Note: Classes scheduled in week segments only.

Note: One training credit per student will be used regardless if student attends 1 or all 3 classes.

Prerequisites

- Attendees will learn how to determine best approach to completing a job but will not learn how to set it up on the machine.
- Recommended for Operators and Programmers responsible for running the machine.

Contents

Days -1 and 2 High Speed Milling

- Class Overview, Tool Holders, and Cutting Tools Suitable for HPM
- Application of These Tools to Real Life Machining
- SIG, Machine Communications, and Transfer

Days- 3 and 4 PRO5 Control Operations

- Basic Pro 5 Screen Navigation
- Coordinate Systems
- Setting Work Coordinate Offsets
- Tools and Tool Offsets
- Program Management and Editing
- Malfunction Prevention and Program Recovery
- Tool Monitoring

Day 5 – Half Day Laser ATLM / FF CAM Demo

- Calibration
- Bull Nose/Ball nose checks
- CAM Theories and Techniques

Schedule 2010 - \$395/person/day

2010 Schedule
[Seating Availability](#)

Note: [On line registration for class enrollment is mandatory to attend any Makino public training held at any of our facilities.](#)

Please indicate if you would like this class presented onsite for large groups!

TO REGISTER: call 1-888-Makino4 and ask for the Training Department or please complete the [Enrollment Form](#) located at www.makino.com.



MAKINO

Makino Technical Training

S Series Preventative Maintenance and Recovery – 2 Days

Provide Operators and Programmers with necessary knowledge and materials to make appropriate decisions related to tooling and programming part geometry which support high-performance machining applications.

Description

This course provides the information necessary to perform basic machine maintenance. The function, location, and principle of operation for the major machine units are described. Emphasis is placed on troubleshooting a machine default, by use of the various diagnostic functions available on the machine tool and the CNC control.

The course consists of classroom sessions and hands-on training.

Contents

- Introduction to Machine
- Safety Precautions and Features
- Troubleshooting Via Machine Side and Control Side Diagnostics
- Description of the Major Units and Their Principles of Operations and Specifications
 - Spindle Head
 - Feed Axis Unit
 - ATC
 - APC

Prerequisites

- Identify dimensions from part drawings and work with coordinate systems.
- Ability to read blueprints, hydraulic diagrams, and electrical schematics.
- Understanding of mechanical systems and basic electricity.
- Familiarity with the tools used to check and repair mechanical, hydraulic, and electrical systems.

Schedule 2010 - \$395/person/day

2010 Schedule
[Seating Availability](#)

Note: On line registration for class enrollment is mandatory to attend any Makino public training held at any of our facilities.

Please indicate if you would like this class presented onsite for large groups!

TO REGISTER: call 1-888-Makino4 and ask for the Training Department or please complete the [Enrollment Form](#) located at www.makino.com.



MAKINO

Makino Technical Training

1 Series with Pro 3 Control Operations Online Training

For a51, a61, a71, a81

Provide Operators with a working knowledge of the terminology, procedures, codes, formats, and the ability to use all control functions necessary to operate the machine in a safe and efficient manner.

Description

In addition to outstanding performance and reliability, 1 Series customers can enjoy added benefits:

- Begin training prior to delivery of machine.
- Train in the convenience of own facility or even at home.
- Eliminate cost associated with traditional training.
- Work at own pace.

Achieve a greater understanding of the machine and featured capabilities!

The web-based training course features animated simulations of the machines and provides a virtual operating experience for an effective understanding. In addition, the course provides an evaluation by a series of multiple-choice questions to ensure a successful completion of the training program.

Contents

- Module 1: Orientation of the Machine
- Module 2: Operation Panels and Modes of Operation
- Module 3: Part Process (Applications) Considerations
- Module 4: Programming
- Module 5: Job Setup
- Module 6: Run Job
- Module 7: Basic Recovery
- Module 8: Productivity Enhancements

Prerequisites

- Pentium III (or higher) and at least 128MB RAM
- Macromedia Shockwave Player
- Windows Media Player 7 or later
- High-speed Internet connection
- Internet Explorer 5 or later
- Screen Resolution: 1024x768 with 24 bit colors

Schedule 2010

Online training is self-paced, to be taken at your convenience.

Note: [On line registration for Online training enrollment is mandatory. Please visit our web site to sign up for our On line training series.](#)

Please indicate if you would like this class presented onsite for large groups!

TO REGISTER: call 1-888-Makino4 and ask for the Training Department or please complete the [Enrollment Form](#) located at www.makino.com



MAKINO

Makino Technical Training

1 Series with Pro 5 Control Operations Online Training

For a51, a61, a71, a81

Provide Operators with a working knowledge of the terminology, procedures, codes, formats, and the ability to use all control functions necessary to operate the machine in a safe and efficient manner.

Description

In addition to outstanding performance and reliability, 1 Series customers can enjoy added benefits:

- Begin training prior to delivery of machine.
- Train in the convenience of own facility or even at home.
- Eliminate cost associated with traditional training.
- Work at own pace.

Achieve a greater understanding of the machine and featured capabilities!

The web-based training course features animated simulations of the machines and provides a virtual operating experience for an effective understanding. In addition, the course provides an evaluation by a series of multiple-choice questions to ensure a successful completion of the training program.

Contents

- Module 1: Orientation of the Machine
- Module 2: Operation Panels and Modes of Operation
- Module 3: Part Process (Applications) Considerations
- Module 4: Programming
- Module 5: Job Setup
- Module 6: Run Job
- Module 7: Basic Recovery
- Module 8: Productivity Enhancements

Prerequisites

- Pentium III (or higher) and at least 128MB RAM
- Macromedia Shockwave Player
- Windows Media Player 7 or later
- High-speed Internet connection
- Internet Explorer 5 or later
- Screen Resolution: 1024x768 with 24 bit colors

Schedule 2010

Online training is self-paced, to be taken at your convenience

Note: On line registration for Online training enrollment is mandatory. Please visit our web site to sign up for our On line training series.

Please indicate if you would like this class presented onsite for large groups!

TO REGISTER: call 1-888-Makino4 and ask for the Training Department or please complete the [Enrollment Form](#) located at www.makino.com



MAKINO

Makino CNC Technical Training

S Series with Pro 5 Control Operations Online Training

For S56 and S33

Provide Operators with a working knowledge of the terminology, procedures, codes, formats, and the ability to use all control functions necessary to operate the machine in a safe and efficient manner.

Description

In addition to outstanding performance and reliability, S Series customers can enjoy added benefits:

- Begin training prior to delivery of machine.
- Train in the convenience of own facility or even at home.
- Eliminate cost associated with traditional training.
- Work at own pace.

Achieve a greater understanding of the machine and featured capabilities!

The web-based training course features animated simulations of the machines and provides a virtual operating experience for an effective understanding. In addition, the course provides an evaluation by a series of multiple-choice questions to ensure a successful completion of the training program.

Contents

- Webinar: Built for Die Mold
- Introduction: Getting Started
- Module 1: Orientation of the Machine
- Module 2: Operation Panels and Modes of Operation
- Module 3: Part Process (Applications) Considerations
- Module 4: Programming
- Module 5: Job Setup
- Module 6: Run Job
- Module 7: Basic Recovery
- Module 8: Productivity Enhancements

Prerequisites

- Pentium III (or higher) and at least 128MB RAM
- Macromedia Shockwave Player
- Windows Media Player 7 or later
- High-speed Internet connection
- Internet Explorer 5 or later
- Screen Resolution: 1024x768 with 24 bit colors

Schedule 2010

Online training is self-paced, to be taken at your convenience

Note: [On line registration for Online training enrollment is mandatory. Please visit our web site to sign up for our On line training series.](#)

Please indicate if you would like this class presented onsite for large groups!

TO REGISTER: call 1-888-Makino4 and ask for the Training Department or please complete the [Enrollment Form](#) located at www.makino.com.



MAKINO

Makino Technical Training

MAKINO TERMS AND CONDITIONS FOR TRAINING

The following terms and conditions apply to all training sessions conducted by Makino. Any additional terms/conditions shall be submitted in writing; such additions shall not be effective until agreed to by Makino. Any attempt to substitute or add terms/conditions are rejected and shall be of no effect.

Makino offers our customers a number of formal training opportunities on selected topics and products. Content is based on specific skill sets and objectives and is designed to transfer a working knowledge and understanding of the machine tool system and related processes.

Makino Training Credits may be provided with the machine purchase based on machine type and machine purchase agreements. These credits must be used during the first year after purchase. Training for additional personnel or after the standard first year period is on a pay basis only.

Training credits on EDM and Milling Machines are determined by the terms of the purchase proposal. Customers wishing to enroll in Makino Technical Training should refer to their purchase proposal for Training Credit details. Additional training is on a pay basis only.

PRICING AND TERMS OF PAYMENT

Payment for training classes is due prior to attending the training session. Makino reserves the right to refuse attendance in a class if payment has not been received.

Rescheduling of a class registration is done at no charge if Makino is notified within 15 working days of the class date. Rescheduling is subject to a fee of 20% of the course tuition if notice is received less than 15 working days of the class date. The full tuition fee will be charged for those students who fail to attend the class or fail to notify of a cancellation.

For those students with training credits, one training credit will be used if attendee's company fails to notify Makino of cancellation or if student fails to attend class.

Course Cost

	Technical Training	Advanced Technical Training
Mason/Regional Locations (Elgin, IL; Waukesha, WI; Auburns Hills, MI)	\$395.00 per person, per day	\$470.00 per person, per day
Onsite Training Requested Note: Minimum of 4 students required to hold on site training	\$395.00 per person, per day plus instructor expenses	\$515.00 per person, per day plus instructor expenses



MAKINO

Makino CNC Technical Training

TRAINING CHARGES

- Onsite training is on a pay basis only and is subject to instructor availability.
- Pricing is based on class sizes between 2 and 6 students. Please contact us to discuss options and possible additional charges if you plan a larger class size.
- Four day courses begin on Monday and end on Thursday.
- All classes are on first shift only. Classes other than first shift will be charged a differential, as shown:
 - Second shift - \$1,000.00
 - Third shift - \$2,000.00

CLASS MEETING TIMES

Course length and meeting times vary by subject and training type. Typically, courses begin at 8:30 a.m. and end at 4:30 p.m. You will be notified should this time vary. All training classes share the following rules unless otherwise noted.

- Breaks are provided during the day, based upon the instructor's discretion.
- Lunch is available in the Makino Café from 11:30 am until 1:30 pm Monday through Friday.

FACILITY RULES

- Makino is a non-smoking facility.
- Students are required to wear a security badge at all times when attending courses held at Makino.
- Safety glasses with side shields and steel-toed safety shoes that meet ANSI standards are required during class time spent in the shop; we recommend for your own comfort that you bring your own safety glasses to class.
- Business casual attire is requested. Neatly pressed jeans, casual pants, and clean gym shoes are acceptable. Please, no shorts, sweat pants, T-shirts with writing, or sandals. Safety glasses with side shields and steel-toed safety shoes that meet ANSI standards are required for all training classes per OSHA and ANSI requirements. Students without these items must reschedule their attendance.

DRUG-FREE WORKPLACE

It is the policy of Makino that the use, sale, transfer, or possession of alcohol and/or drugs on premises, vehicles, work sites, or in any private vehicles parked on Makino's property is prohibited. Additionally, Makino prohibits individuals from attending any training class under the influence of alcohol and/or drugs. If a Makino instructor determines that an individual attending a training class is under the influence of alcohol and/or drugs, the individual will be asked to leave the premises.



MAKINO

Makino Technical Training

Airline Savings

You can take advantage of Makino's in-house travel agent. They will gladly locate the lowest possible airfare to Cincinnati, Ohio or our regional office locations. To take advantage of this savings call 513-573-4556 and ask to speak to the Corporate Travel Director.

After reservations are made, an itinerary is faxed or e-mailed to you for approval. After approval, tickets are issued electronically and the confirmation will be faxed or e-mailed to you.

Hotel Savings

Hotel reservations will be made, if requested on the Enrollment Form. Makino can provide a reduced cost if rooms are booked by Makino. We suggest you take advantage of this savings by filling out the Hotel Request Information on the Enrollment Form.

Hotel reservations must be made in the student's name, so a specific name and the number of nights required must be indicated on the Enrollment Form.

The Enrollment Confirmation letter will contain hotel accommodation information. Payment of all hotel charges is the responsibility of the individual concerned. Advance notice of cancellations is required to avoid back charges. Hotel cancellation charges resulting from inadequate cancellation notification will be invoiced to the customer.

For our Mason, Ohio facility, you can take advantage of reduced hotel rates by staying at the Kings Island Inn:

KINGS ISLAND RESORT & CONFERENCE CENTER
5691 KINGS ISLAND DRIVE
KINGS ISLAND, OH 45034-0906
513-398-0115/1-800-727-3050

This hotel includes a free breakfast and daily transportation to and from Makino. NOTE: For transportation from the airport to the hotel, please contact our Corporate Travel Director at 513-573-4556.

For our Auburn Hills, Michigan facility, you can take advantage of reduced hotel rates by staying at the Wingate Inn:

WINGATE INN
200 FEATHERSTONE ROAD
AUBURN HILLS, MI 48326
PH: 248-334-3324/FAX: 248-334-2057

This hotel includes a breakfast bar; 24-hour business center (computer, fax, copier, printer, internet); USA Today newspaper; fitness room with whirlpool; microwave, refrigerator, safe, hair dryer, coffee maker; and an indoor heated pool.

NOTE: There is no transportation provided from the airport or hotel to the classroom in Auburn Hills.



MAKINO

Makino CNC Technical Training

Course Registration

Note: *Enrollment to attend any Makino public training must be done through our website!*

Are You Ready to Enroll in a Class?

Makino provides classroom space on a first-come first-served basis. If a requested class is filled, applicants are notified and placed on a waiting list or rescheduled for a later class date. Additional classes are scheduled when possible, if the number of people on the waiting list fills a class to minimum capacity. If the waiting list does not warrant scheduling additional classes within a 6 month period, an attempt will be made to accommodate individual training needs on a "special" basis.

To provide the best possible training environment, Makino reserves the right to limit class size.

Registration

All students are required to fill out an enrollment form to register for classes. Due to the demand for classes, enrolling as early as possible is recommended. Students are not considered enrolled for a class until they have received confirmation that their application for class has been accepted. It is recommended that enrollment forms be received by Makino at least 15 working days prior to the class date.

- Class transportation is provided at no charge from the hotel to Makino.
- To prevent missing vital information, we request that students do not conduct other business during class hours.

Ready to enroll for class?

[Click here](#)

Simply fill out the electronic enrollment form and hit submit. You will receive confirmation of your enrollment via e-mail or fax within 24 hours.

Proper photo identification (i.e., driver's license or alternative photo ID) must be provided by all attendees to the instructor on the first day of training. Foreign national attendees must provide passport identification prior to attending class. Makino reserves the right to refuse training or technology transfer to anyone who does not provide sufficient documentation.

Safety glasses with side shields and steel-toed safety shoes that meet ANSI standards are required for all training classes per OSHA and ANSI requirements. Students without these items must reschedule their attendance.

Cont.



MAKINO

Makino Technical Training

Cancellation Notice:

Makino reserves the right to cancel a class at any time. Please **do not make non-refundable travel arrangements for class**. Makino is not responsible for travel arrangements made for classes.

If you have any difficulty, questions or concerns with the registration process do not hesitate to contact our Training Project Leader for assistance with registration.

Assistance: 1-888-Makino4 and ask to speak with our Phone Coordinator

- Participating hotels and terms of the Makino group rate may change during the life of this document.

Class Cancellation

Makino reserves the right to cancel a class at any time. If a class should be cancelled, registrants will be notified prior to the scheduled class date. Students registered for a cancelled class will be given priority for rescheduling in future classes or placed on a waiting list, if no other class is available.

Due to possible class cancellation, it is recommended that only refundable tickets be purchased for transportation to training classes. Makino is not responsible for travel arrangements made for classes.