Okuma
Factory Training
for
Fundamental Programming and Operation
4 Axis Horizontal Machining Center

Course Code : MC602
Prerequisite : None
Credits : 0
Course length : 5 days
Class Size : 6 persons

COURSE OBJECTIVES - Upon completion, the individual will be proficient in all basic skills necessary to allow the functional / productive operation of the machine tool, and associated safety practices.

The course is aligned to providing the knowledge and skills required to "translate" the part drawing into a finished product. The individual will be capable of defining the list of required processes, their logical / optimum sequence, create the complete CNC part program, install the appropriate tools correctly, establish the program zero point, and perform corresponding tool offsets.

Course emphasis is a blend of classroom instructional theory, time spent on the machine tool, and individually displayed skills.

Comprehension of the topics is measured by both actual demonstration and an exam.

COURSE REGISTRATION - please contact *Von Pickett* at (803-981-7000) the Institute for Manufacturing Productivity to obtain program availability dates, or check our website **http://imp.okuma.com**

MC602 Course Outline

Monday

- Introductions
- Course Objectives
- Overview of machining center- major components and terminology
- Basic workholding methods and cutting tools
- Machine axes - unit systems - coordinate systems
- Tool path Illustrations
- Program words - S, T, M, G, F, format lists
- Linear Interpolation
- Circular Interpolation
- Basic CNC Program Example - Absolute/Incremental
- Cutter Radius Compensation Function
- Create Part Program per print and Debug
- Day's Review

Tuesday

- Q & A on previous day
- Today's Objectives
- Manual Drilling Motions
- Drilling, using G81 cycle
- Tapping, using G84 cycle
- Fixed Cycles - formats
- Fixed/Canned Cycle - G71
- Review balance of Fixed/Canned Cycles
- Subroutines
- Programs using subroutines and fixed cycles
- Use of Common Variables
- Create Part Programs per print and Debug
- Safety issues in program creation
- Day's Review

Wednesday

- Q & A on previous day
- Today's Objectives
- Programming for supplemental axes
- Using .SSB, .SDF, and .LIB program files
- Using M00, Optional Stops, and Block Delete in programs
- Program flexibility - use of Local Variables
- Main Spindle - ranges, horsepower, and nomograms
- OSP 7000M, 700M, 5020MG Control - Edit Mode

- Create Part Program to use at machine
- Day's Review

Thursday

Note: the balance of instructional time will be at the machine

- Q & A on previous day
- Today's Objectives
- Using machine manuals
- Control Overview
- OSP 7000M, 700M, 5020MG CNC Control Panel
- Control Panel Modes
- Tool Data / Cutter Compensation Offset Registers
- Mac Man Function (7000/700M only)
- PIP Functions / Basic Communication - MS DOS and or RS232C
- Machine Operation Safety
- Tool Pot/Tool Number Table
- ATC Operation
- Zero Set Procedure
- Machine Lock & Dry Run Program Execution
- Graphic Simulation Function
- Single Block 1st piece
- Day's Review

Friday

- Q & A on previous day
- Today's Objectives
- Completion of machined parts
- Program restart function
- Open Discussion
- Student Evaluation and Test
- Review of Test
- Certificates
- Overview of common options
- View Video Case Studies
- Dismissal

Okuma
Factory Training

COURSE MATERIALS

OTI will utilize an array of materials to assure the most effective means of material presentation. Most typically, routine presentation devices will include overhead projector, VCR & monitor. In addition, an OSP simulator will reside in the active classroom, allowing for a immediate means of graphic reinforcement to the learning process/subject.

Upload/downloading of part programs will be done using laptop computers, and either Procomm, or Windows Terminal communication software; and either Disk Drive (on 7000L / 700L), or by RS232C port.

For those classes requiring the use of PC's, Okuma will provide an independent workstation for each attendee.

Attendees will be furnished with all appropriate manuals, handbooks, examples, etc. - in short, those constructive reference material that correlate to the course content and its ultimate goals.

Additional copies of course materials are available, and can be obtained by contacting your local Okuma distributor. Charges will be appropriately based on the actual material(s) being sought.

Okuma
Factory Training
for
Fundamental Programming and Operation
4 axis Horizontal Machining Center

PRE ATTENDANCE EVALUATION

Course Code : MC602
Prerequisite : None
Credits : 0
Course length : 5 days
Class Size : 6 persons

Name _____

Company _____

Okuma Distributor _____ **Class Date Requested** _____

Have you ever attended any course offerings at Okuma?

_____
_____
_____

Please list the current Okuma equipment at your present facility ?.

_____
_____
_____

Of the above list, what has **your Okuma experience** been todate ? - I.e. setup, operator, processing, etc..

_____
_____
_____

What other related CNC machinery have you operated; or are familiar with its general operation, and programming format ?

_____
_____
_____

Do you have any technical training that is related to CNC machine tools ? If so, please list.

_____
_____
_____

In your daily job responsibilities, please check all that apply:

☐ tooling selection	☐ program creation	☐ machine setup
☐ process editing	☐ production runs	☐ inspection

What specific skill(s) do you wish to strengthen by attending the attached course. Please list in the order of importance - (1-5).

( ) Machine safety	( ) setup techniques	( ) manual operations
( ) CNC program creation	( ) tool path/layout	( ) other _____

Check **all** that apply; - I am familiar with:

☐ interpreting blueprints	☐ basic measuring tools	☐ basic math
☐ angular measurement	☐ geometry	☐ trigonometry
☐ tool selection	☐ materials knowledge	☐ speed/feeds
☐ workholding methods	☐ inspection methods	☐ stat. process control

For what **specific machine model** is this training being sought ?

_____
_____

What, if any, **specific topics** are ***not*** listed in the attached course outline that you feel are *critical* for your complete satisfaction in attending **this** course.

_____
_____
_____
_____

☺ Thank you for completing the above questions. These responses will assist Okuma to better evaluate your needs/expectations regarding the attached course offering.

Other:

The Okuma Institute for Manufacturing Productivity has a dress attire as follows:

Men
Sports shirts or other with collar
Casual or Dress slacks
No bluejeans, shorts, T shirts, or sneakers

Women
Shirt or blouse with collar
Dress slacks, shirts or dresses
No bluejeans, shorts, sandals

Safety glasses are required when in the showroom / shop areas, and are supplied at no charge.

Lunch is provided for students attending classes. Students eating lunch off campus are to refrain from alcohol consumption due to safety regulations.