

Okuma

Factory Training

for

Advanced Programming and Operation of 4 axis Lathes and Touchsetter A/M

Course Code : TC502
Prerequisite : TC501
Credits : 0
Course length : 3 days
Class Size : 6 persons

☞ **Overview:** The use of a 4 axis methodized machining process offers the highest level of productivity and machine tool utilization.

COURSE OBJECTIVES - Upon completion, the individual will be proficient in all advanced skills necessary to implement the productive enhancements obtainable by 4 axis methodizing / processing, operation of the machine tool, and associated safety practices.

The course is acutely aligned to providing those specific skills required to efficiently and accurately develop part programs employing the 4 axis part processing/programming techniques, the touchsetter , and their combined usage to maximize machine productivity.

Part programs will be created with a consistent focus on identifying those specific part features that readily lend themselves to 4 axis structured programming, and simultaneous process/machining.

The individual will be capable of defining / sorting the list of required processes , their logical / optimum sequential order, create the complete CNC part program, install the appropriate tools correctly, establish the program zero points, perform corresponding tool offsets, and related machine safety procedures.

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>

TC502 Course Outline

Monday

- Course objectives
- Introductions
- Describe major components and terminology
- Four Axis Justification Examples
- Applying 4 Axis Concepts to current parts/processes
- Theoretical / Practical Limitations of 4 axis turning
- Additional Machine axes - unit systems - coordinate systems
- Supplementary program words: S, T, M, G, F, format lists
- Machine interlocks / Machine Safety
- Tool Interference Function
- Axis Process Planning and Tool Layout considerations
- Axis Illustrations
- Safety issues in 4 axis programming
- Review a Basic Program Example
- Axis Programming Structure/Format Options
- Using "P" code and M110 Synchronization Commands
- Priority Commands
- Program Creation and Review
- Programs using CALL Statements
- Program creation and review
- Day's Review

Tuesday

- Q & A on previous day
- Today's Objectives
- Using machine manuals
- OSP 7000L / 700L /5020LG CNC Control
- A/B Panel Key
- Control Modes - Manual, Parameter, Zero Set
- Tool Data Mode Offset Registers
- OSP MS DOS Function (OSP 700L/700L only)
- OSP Mac Man
- Operation Panel
- Machine Operation Safety
- Setup machine and install tooling
- Zero Set Procedure
- Create part program for use at machine
- Graphic Simulation Function
- Data PIP files
- Upload program by Disk and or RS232C port

- Machine Lock & Dry Run Program Execution
- Independent Turret Selection
- Single Block 1st piece
- Auto Cycle Operation
- Program Restart Function
- ☑ **Intro. to Touchsetter M**
- Describe major components and terminology
- Machine interlocks / Machine Safety
- Touchsetter accuracy
- Care and Maintenance
- Manual Operation Panel
- Calibration Procedure & Reference Tool
- Parameter Settings

Wednesday

- Q & A on previous day
- Today's Objectives
- ☑ **Intro. to Touchsetter A**
- Describe major components and terminology
- Machine interlocks / Machine Safety
- Touchsetter accuracy
- Care and Maintenance
- Manual Operation
- Calibration Procedure & Reference Tool
- Parameter Settings
- Program Words
- Tool Breakage, Tool Detect, Tool Offset Function
- Sample program Review
- Tool Path & Axis Movements
- Program Call Statements
- Subprograms OCNCK & OMSSF
- Create program and Review
- Advanced Graphics
- User Alarm Programming
- Open Discussion
- Student Evaluation and Test
- Review of Test
- Certificates
- Overview of common lathe options
- View Video Case Studies
- Dismissal

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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.

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PRE ATTENDANCE EVALUATION

Course Code : TC502

Prerequisite : TC501

Credits : 0

Course length : 3 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:

- | | | |
|--|---|--|
| <input type="checkbox"/> tooling selection | <input type="checkbox"/> program creation | <input type="checkbox"/> machine setup |
| <input type="checkbox"/> process editing | <input type="checkbox"/> production runs | <input type="checkbox"/> inspection |

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

- | | | |
|---|---|--|
| <input type="checkbox"/> Machine safety | <input type="checkbox"/> setup techniques | <input type="checkbox"/> manual operations |
| <input type="checkbox"/> CNC program creation | <input type="checkbox"/> tool path/layout | <input type="checkbox"/> other _____ |

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

- | | | |
|--|--|--|
| <input type="checkbox"/> interpreting blueprints | <input type="checkbox"/> basic measuring tools | <input type="checkbox"/> basic math |
| <input type="checkbox"/> angular measurement | <input type="checkbox"/> geometry | <input type="checkbox"/> trigonometry |
| <input type="checkbox"/> tool selection | <input type="checkbox"/> materials knowledge | <input type="checkbox"/> speed/feeds |
| <input type="checkbox"/> chucking methods | <input type="checkbox"/> inspection methods | <input type="checkbox"/> 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.