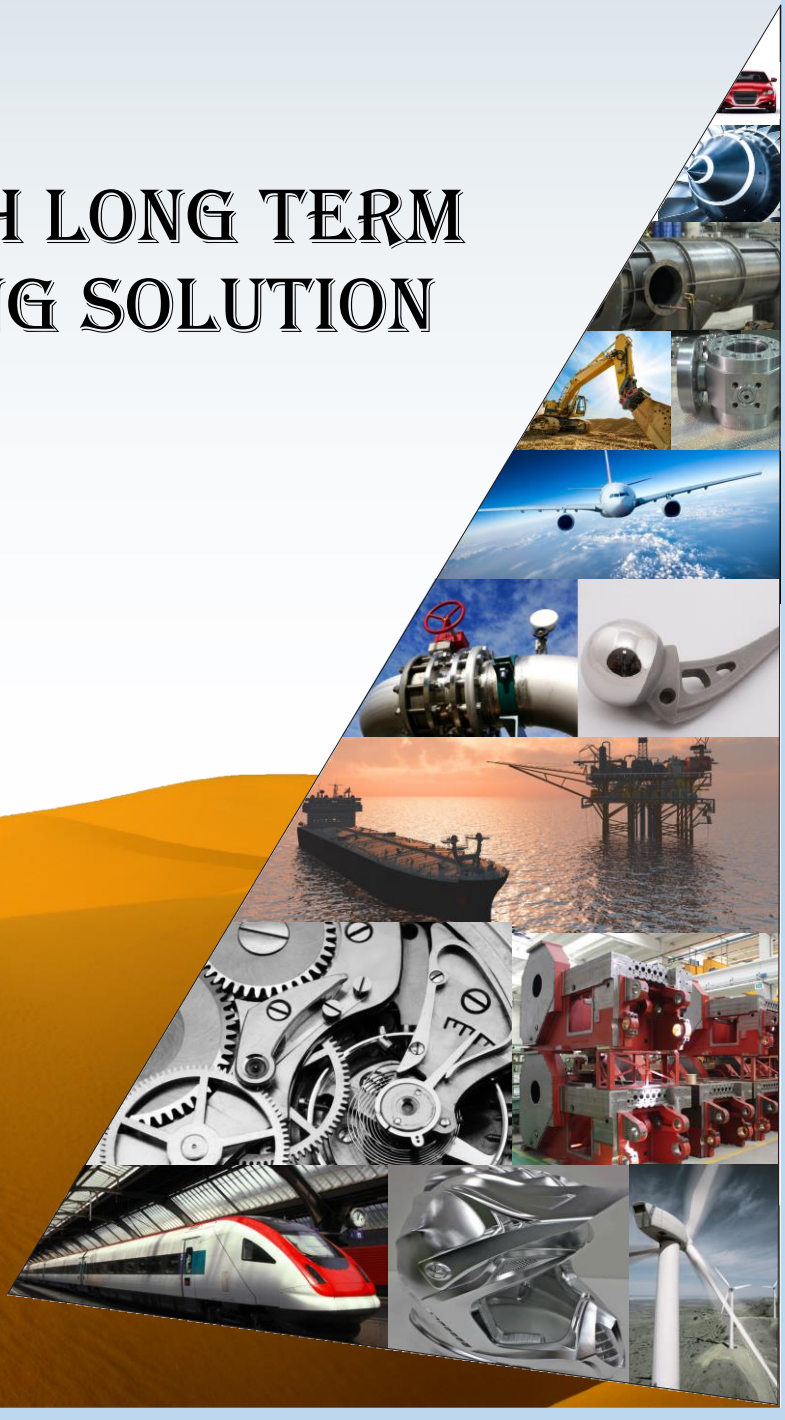
PASStech

OVERMACH GROUP

PASSTECH LONG TERM TRAINING SOLUTION



PASSTECH ACADEMY

Our experience at your service

Focus on your business needs!
Our international machine tools training

Leaders in professional, industry-oriented qualification **training solutions** for process and factory automation in the field of **machine tools**.

A unique approach

- We are committed to your specific business processes. All the training contents will be tailored-made and costed upfront and then carefully projected for you.
- We understand the languages, cultures, and ways of doing business you need to succeed.
- Our diverse international trainers' workforce mens you benefit from the range of skill, knowledge and expertise that comes from a Italien firm which embraces talent whatever the origin.
- All the training programs are studied and delivered in partnership with Italian Universities, to find the right balance between theory and "on field" approach.
- The training locations are carefully chosen to satisfy all your needs; we often organize training lessons in Italy, to combine the training time to memorable visits to famous Italian cities.

Training Program (standard)
Multi-skilled Technicians and maintenance Operators

The Training Program provides the skills and tools for:
Defining maintenance standards and plans:
- Tackling complex, non-standard problems
- Building a preventive maintenance system
- Managing maintenance costs
- Methodically tracing and assessing the abilities of technicians and maintenance operators.

Programming
- Working on the machine configuration, options, functions, CNC
- Profitably use programming Documentation, manuals etc.
- CNC programming Language
- Writing a Part Program of one work pieces
- Optimizing a Part Program, avoid collisions, to do a test of part program

Technological processing:
- Defining and designing the right machining process
- Selecting tools
- Manual checking, machine checking

Standard Training Program (7 weeks - 210 hours)

	MODULES	TIMING (standard)
1	BASICS OF INDUSTRIAL AUTOMATION	3 weeks (90 hours)
2	MACHINE TOOLS KNOWLEDGE	3 weeks (90 hours)
3	SPECIFICITY IN THE MIDDLE EAST ENVIRONMENT	1 week (30 hours)

Build your Training Program

- Contents and duration of each module can be tailored-made and based on your own business profile.
- They can be attended also individually and in group (saving solution)
- The minimum suggested training Program is 4 weeks (120 hours)

Who it is aimed at.

- Technicians and Maintenance Operators working in industrial companies (both beginner ans experts' level)
- Fitters and technicians in the production are working in companies that build plants and machinery.
- After-sales Assistance Technicians

All the lessons will be held in English language.

Training Program *(standard)*
Multi-skilled Technicians and maintenance Operators - Module 1

BASICS OF INDUSTRIAL AUTOMATION - Time schedule: (90 hours)

Target:
The course is aimed at giving a solid background on industrial automations to the operators of CNC machines. the course will cover the basic notions of applied mechanics and will also be focused on the analysis and on the use of the components of an automatic CNC machine.
All the technologies of widest use in the field of automation will be analyzed both from the point of view of hardware and software usage.

Main Topics:
1. Basics of applied mechanics (20 hours)
2. Hydraulic and pneumatic system (20 hours)
3. Electric and electronics systems for industrial automation (15 hours)
4. Automation software (15 hours)
5. PLC and embedded systems for the automation (15 hours)

1.1 Basic of applied mechanics:
The introduction of the course will cover the basics of mechanical systems, by analyzing the structure and the functionality of mechanical transmissions, the concept of efficiency of machines, and the concept of motor-load coupling. An introduction to metal machining will be given as well.

1.2 Hydraulic and pneumatic systems:
Hydraulic and pneumatic systems are widely used in industrial automation systems. During this part of the course the components of a fluid-system will be analyzed, including pumps, actuators and control valves.

1.3 Electric and electronic systems for industrial automation:
This course part will introduce the most important aspects of electric actuators (stepped motors, brushless motors, DC motors) and of the power handling systems (H bridges, switched convertors). the sensors of wide use in industrial applications will be introduced as well, together with the analog-to-digital and the digital-to-analog converters.

1.4 Automation software:
All the mechatronic systems, and in particular the ones used in industrial applications, require the use and the development of specific software tools. An overview of the software technologies of widest usage in the fields of automation and CNC systems will be given.

1.5 PLC and embedded systems for the automation:
Industrial automation and CNC control are usually developed on very specific embedded systems. During this phase of the course the embedded systems of most common usage will be analyzed in their structure, in their behavior. The software development of PLC systems will be introduced as well.

Multi-skilled Technicians and Maintenance Operators - Module 2

MACHINE TOOLS KNOWLEDGE - Time schedule: (90 hours)

Target:
The course is aimed at providing a solid basic knowledge to operate on machine tools with numerical control (CNC). The course covers the basics of mechanical technology, and then focus on programming CNC machines. A significant part of the course consists in an intensive practice on programs for processing and analysis of chip removal processes. All lectures will be held in English.

Main Topics:
Basic of Industrial Design (10 hours)
Fundamentals of Mechanical Technology (20 hours)
Basics of numerical control machine tools (10 hours)
NC programming (25 hours)
Practical Programming (25 hours)

2.1 Basics of Industrial Design
The starting point of Module 2 is about the interpretation of mechanical drawings. Dates will be the basis for understanding the technological information present in the mechanical drawings, such s dimensions, tolerances, surface roughness, etc. . and how these affect the strategies of working with machine tools.

2.1 Fundamentals of Mechanical Technology
At this stage of the course will analyze the chip removal main processes such as turning, milling and processing of the holes. Then you will go to the analysis of the cycles of manufacture of the product, and then to the rudiments of dimensioning of the cutting for a machining with chip removal.

2.3 Basics of numerical control machine tools
At this stage of the course will analyze the main components of machines numerical control and their influence on processing.
Furthermore, the lectures will be followed by the practical stage directly on the machine tool.

2.4 NC programming
We will analyze the different programming languages for the various machine tools and analyze the NC program for milling and turning. Then you will be requested to accomplish manually programs on numerical control.

2.5 Practical Programming
In last part of Module 2 participants will be requested to perform manually turning to milling processes on machine tools; in that stage the main controls and all the basics to manage the machine will be shared and known.

The price refers to the training and includes lunch during the 5 days of the course in each week.

Accommodations, travel, and week-end tours are out of the price.
We can plan all the travelling tour (tour of Milano, Roma, Venice) - price to be defined.

PASStech
OVERMACH GROUP

EDUCATIONAL FANUC SIMULATOR FOR STUDENTS

CNC Customization Support

Purpose
- Operation screen development
- Application development in C language
- Ladder program development

Features
- For machine tool builders
- Also supports multi-axis, multi-path
- We provide network license version for 10, 20 people as well as site license

Learning CNC Operation/ Machining Program

Purpose
- Learning CNC operation
- Learning CNC programming

Features
- Uses actual hardware
- For education
- Availability of machining center and lathe in one simulator
- Universal power supply (100VAC to 240VAC)

Learning CNC Operation/ Machining Program

Purpose
- Learning CNC operation
- Learning CNC programming

Features
- Software for PC
- For education
- We have prepared a sample program that is handy for learning
- It is available for classroom use or individual learning at home

CNC GUIDE

CNC GUIDE is a PC software that enables the execution and display of what is equivalent to the actual CNC. One can learn how to operate CNC, check the machining program, confirm the operation of customization features.

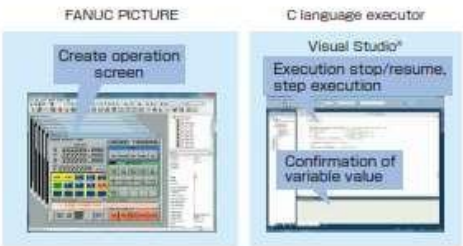
CNC GUIDE

Development and debugging of custom screens and ladder programs can be effectively performed on the PC. As you can actually debug on a PC in the office before changing the customized software on the actual machining tool, it will improve efficiency of development work.

FANUC PICTURE
- Confirm the functionality of the screens created with FANUC PICTURE on the CNC GUIDE
- The executable screens confirmed on the CNC GUIDE can be loaded on the CNC without converting them

C Language Executor
- C language program for CNC is compiled for the PC and operation is checked on the CNC GUIDE
- Source code debugging using Visual Studio®1)

PMC Simulation
- Simulation of the ladder program performed on the PC
- Supports various functions such as Multi-path PMC and Function Block
- Debugging by FANUC LADDER-Ⅲ via Ethernet connection



Scope of Supply

- CNC simulator for users
- CNC guide - it is pc software to enable the execution and display of what is equivalent to the actual and real CNC
- CNC simulator - it is a training device which uses the actual hardware. Learning cnc operation using actual CNC display
- CNC guide education package - to have possibility to perform cnc operation training on your pc
- Training package and installation of software on your pc for 1 week
- No expiration for the license

Description - NC Guide Academic Package

NC Guide Academic version is appropriate for the educational institutes and the training centers for the training of CNC operators with basic functions. The CNC Simulation function and MANUAL GUIDE I simulation function can be used with this package.

The package is available with Classroom and Homework version

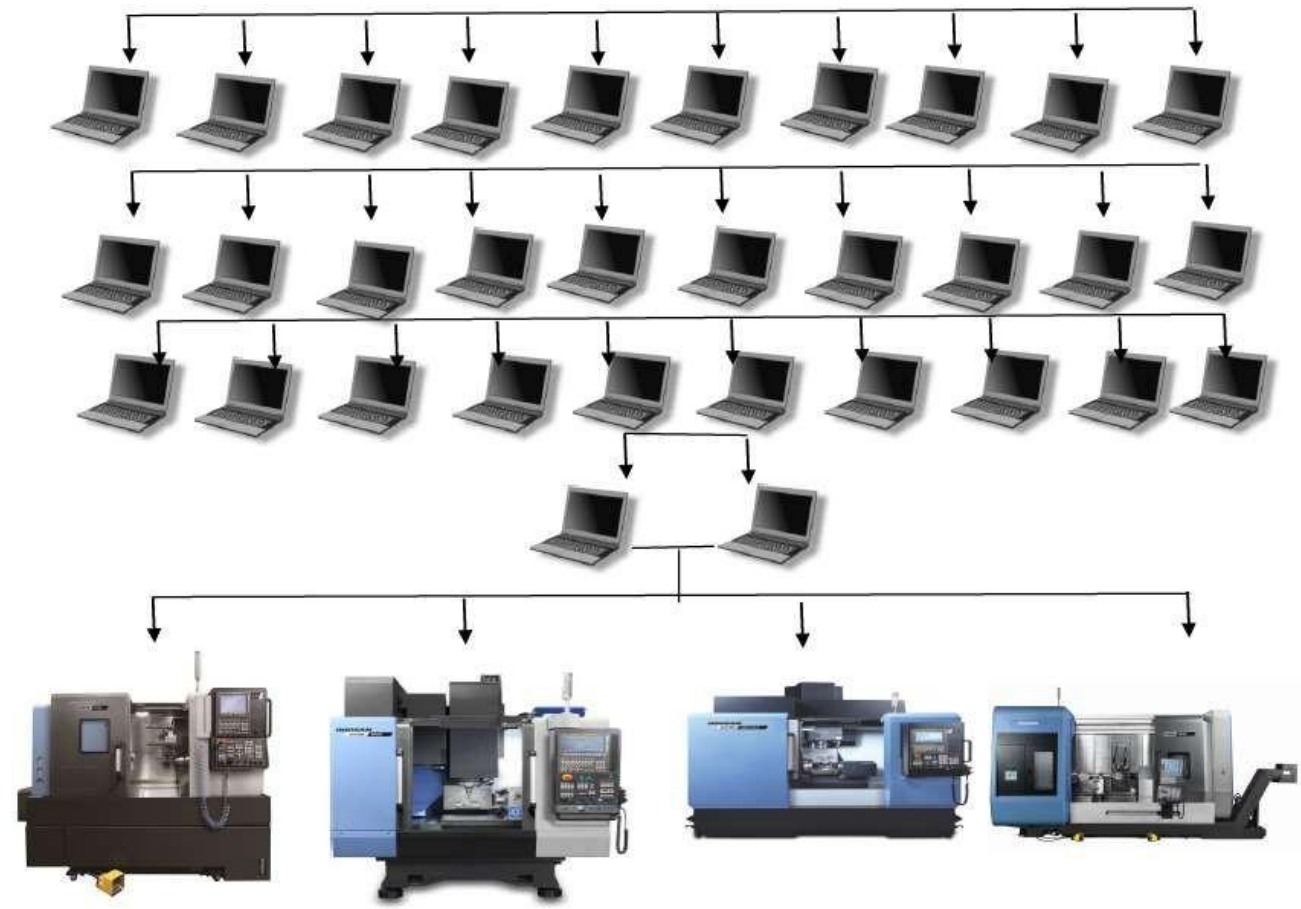
1) Classroom Package: The classroom session with NC Guide simulation on the Multi PC network on connected to server through LAN
   a. 1 Network license key
   b. License key connected with network server
   c. NC Guide can be used by PC which connected to server through LAN
   d. NC Guide can be used by maximum of 16 user at a time in the LAN
   e. No expiration for the license
2) Homework Package: The NC Guide can be used on the PC which not connected to server in the classroom and the students can use it to the study at home
   a. 1 license key for individual PC
   b. The license will expire in one year
   c. Suitable to distribute the license for new students every year

   Specification: The machine composition that can be set and an executable NC program is as follows

   Restrictions: The following functions are not available with Academic Package
   - C language executer function
   - Macro executer function
   - FANUC Picture function
   - PMC Simulation function
   - Machine signal simulation function

   Advantages
   - Software from Fanuc - It is standard and the same worldwide
   - Supplied by Overmach/Passtech - Already supplied to various customers through Overmach System
   - No extra cost after installation
   - The availability of our Trainor at any time (schedule and cost to be quote as per request)

FANUC – CNC GUIDE AND CNC SIMULATOR



Package for On-Line using of Simulator

- We will supply the Fanuc options to be connected on remote between the simulator c/o Academy and the students at home
- We will make configuration of all laptops to be able to be online.
- The structure of internal Server in your Company is at your charge and responsibility

PASStech
AN OVERMACH GROUP COMPANY

PASSTECH CNC TRAINING AND COURSES

PASStech
AN OVERMACH GROUP COMPANY

Machine Operator Training

Duration: (Dependent on Machine Model)

Course Content

Power On and Off
Description of the Control Panel
i. Mode selection
1. Edit.
2. Memory (or) Auto
3. MDI.
4. Handle , Ref. Return, Jog & Rapid
ii. Feed Control function.
iii. Spindle Speed control function.

1. Edit:
New program creation.
New folder creation.
Copy , Paste , Delete,
Transfer program IN and OUT from Mem.Card or USB
Program selection for Auto mode.
Back ground edit

2. Memory or Auto:
Memory related options.
single block
optional stop (M01).
Dry run
Machine lock for Graph .
program repeat and restart.

3. MDI:
Single code cycle program.
Tool change.
Spindle rotation.

4. Handle, Ref. Return , Jog & Rapid.
Axis movement by handle
Axis movement by Feed in Jog mode
axis movement by Rapid mode.
Ref. Return to all axis.

Work Holding
1. Work piece clamping systems for milling
2. Work piece clamping systems for turning

Tool Setting
1. Tool holder and tool setting for milling
2. Turning tool holders setting and Boring bar setting.

Tool offset:
1. Description of Tool offset .
2. measuring method by Renishaw and Manual method
for milling and turning.
3. Dimension deviation correction method

Work Offset Setting:
1. Description of Work offset.
2. Explanation and Measuring method for milling and turning.

PASStech
AN OVERMACH GROUP COMPANY

Programming Training Course Turning 2 axis FANUC

Duration: 2 Days

Machine Type : Lathe
No of Axis : 2
Controller : Fanuc Nc

Course Content

- Controlled Axes
- Preparatory Functions (G-Codes)
- Miscellaneous Functions (M-Codes)
- Coordinate Systems and Work Shift
- Reference Return Function G28/G30
- Absolute & Incremental co-ordinates
- G00 – Rapid Traverse
- G01 – Linear Interpolation (Feed Move)
- G02/G03 Circular Interpolation
- Cutting Feed rate Command
- Tool nose radius Compensation G40/G41/G42
- G98 and G99 functions
- Spindle Function
- Tool Selection
- Alphabetical words function in Programming.
- Cycles Syntax format for programming
- Auto Tailstock or manual tail stock Setting
- Auto Tool offset measure or Manual tool offset measure.

Program Start Up & End

- Basic Cycles
- G90- Basic Turning
- G92 – Basic Threading
- G94 – Basic Facing

- Multi Repetitive Cycles
- G71- Stock Removal In Turning (External & Internal)
- G72 – Stock Removal In Facing
- G70 - Finishing Cycle
- G73 - Pattern Repeat
- G74 – Face Grooving
- G74 – Peck Drilling
- G75 – O/D Grooving
- G76 – Multi Pass Threading Cycle (Ext & Int.)

- Drilling Cycles
- G83- Face Drilling
- G84 – Face Tapping
- G85 – Face Boring

PASStech
AN OVERMACH GROUP COMPANY

Programming Training Course Turning 3 axis FANUC

Duration: 4 Days

Machine Type : Lathe
Axis : 'X' 'Z' & 'C'
Spindle : Single Spindle
Turrets : Single Turret

Course Content

- Controlled Axes
- Preparatory Functions (G-Codes)
- Miscellaneous Functions (M-Codes)
- Coordinate Systems and Work Shift
- Reference Return Function G28/G30
- Absolute & Incremental co-ordinates
- G00 – Rapid Traverse
- G01 – Linear Interpolation
- G02/G03 Circular Interpolation
- Tool nose radius Compensation G40/G41/G42
- G98 and G99 functions
- Spindle Function
- Tool Selection
- Alphabetical words function in Programming.
- Cycles Syntax format for programming
- Auto Tailstock or manual tail stock Setting.
- Auto Tool offset measure or Manual tool offset measure.

Program Start Up & End

Turning process

- Basic Cycles
- G90- Basic Turning
- G92 – Basic Threading
- G94 – Basic Facing

- Multi Repetitive Cycles
- G71- Stock Removal In Turning
- G72 – Stock Removal In Facing
- G70 - Finishing Cycle
- G73 - Pattern Repeat
- G74 – Face Grooving
- G74 – Peck Drilling
- G75 – O/D Grooving
- G76 – Multi Pass Threading Cycle
- Drilling Cycles
- G83- Face Drilling
- G84 – Face Tapping
- G85 – Face Boring
- Worked Examples

- Milling Process
- 'C' Axis Drilling (G83 to G89)
- 'C' Axis Polar Interpolation
- 'C' Axis Cylindrical Interpolation
- Worked Examples Worked Examples
- 'C' & 'Y' Axis Drilling (G83 to G89)
- 'C' & 'Y' Axis Milling
- Worked Examples

PASStech
AN OVERMACH GROUP COMPANY

VMC Programming Training Course

Duration: 4 Days

Machine Type : Milling
3 Axis : 'X' 'Y' & 'Z'
4 Axis : 'X' 'Y ''Z' & 4th Rotary Table

Course Content – 3 Axis

- Controlled Axes
- Preparatory Functions (G-Codes)
- Common G-Codes
- Miscellaneous Functions (M-Codes)
- Start Up & End Program with Explanation
- Coordinate System (G54 – G59)
- Absolute & Incremental (G90 / G91)
- Interpolation Functions (G00 / G01 / G02 / G03)
- Reference Return Function (G28)
- Sub Programs (M98 P????)
- Changing X, Y, & Z Datum's
- Drilling Cycles (G73 – G89)
- Cutter Radius Compensation (G40 / G41 / G42)
- G94 and G95 functions.
- G98 and G99 functions on Canned cycles

Auto tool measure or Manual tool offset measure.

Work coordinate setting types

- Worked Examples.
- ATC recovery

Course Content – 4 Axis

- Controlled Axes
- Preparatory Functions (G-Codes)
- Common G-Codes
- Miscellaneous Functions (M-Codes)
- Start Up & End Program with Explanation
- Coordinate System (G54 – G59)
- Absolute & Incremental (G90 / G91)
- Interpolation Functions (G00 / G01 / G02 / G03)
- Reference Return Function (G28)
- Sub Programs (M98 P????)
- Changing X, Y, & Z Datum's
- Drilling Cycles (G73 – G89)
- Cutter Radius Compensation (G40 / G41 / G42)
- G94 and G95 functions.
- G98 and G99 functions on Canned cycles

Auto tool measure or Manual tool offset measure.

Work coordinate setting types

- Worked Examples
- 4th Axis Programming
- Worked Examples
- ATC recovery

PASStech
AN OVERMACH GROUP COMPANY

Manual Guide I FANUC Programming Course

Duration: 4 Days

Course Content - Turning

- Main Features of Manual Guide i
- Creation of Fixed Forms
- Creating and Editing Part Programs
- Turning Cycles
- Hole Machining
- Outer Roughing
- Inner Roughing
- Face Roughing
- Outer Finishing
- Inner Finishing
- Face Finishing
- Grooving Cycles
- Face Grooving
- Outer Grooving
- Inner Grooving
- Threading
- Outer Threading
- Inner Threading
- Setting Tool Data
- Graphical Simulation
- NC Conversion
- Input / Output via Memory Card
- Worked Examples

Course Content - Milling

Controlled Description

- Accessing the Manual Guide Screens.
- Configuration of Fixed Forms.
- Configuration of Tool Data.
- Using Cycles for Rough Milling Contours & Pockets.
- Using Cycles for Drilling, Reaming, Tapping etc.
- Simulation on Graphics.
- N.C. Conversion.
- Time Calculation.
- Program Copying, Pasting & Cutting.
- Editing Programs & Processes.
- Tool Path Graphics.
- Graphic Rotation and scaling etc.
- Drawing Billets of Different Shapes.
- Examples of the Above.
- Copy Rotation.
- Copy Parallel.
- Program Input & Output through Memory Card.
- Data Backup for Settings (Maintenance only).

PASStech
AN OVERMACH GROUP COMPANY

Maintenance Training Course

Duration: 2-5 Days

- ✓ **LEVEL 1 = 2days**
- ✓ **LEVEL 2 = 3 days**
- ✓ **LEVEL 3 = 5 days**

Course Content

- Basic Machine Operations
- Machine General Specification
  - Each Unit Specification
- Safety Precautions
- Circuit Diagrams and Functions
- Check points against trouble
- Fluid checks and replacement
- Coolant management
- Alarm / Messages
  - Current
  - History
  - How to Clear
- ATC / APC / Tool Post
  - Recovery
  - Troubleshooting
  - Servo Drive Parameters
- Machine Backup
  - Creating Backup
  - Loading Backup
- Automatic Tool/Workpiece Measurement
  - Setup
  - Calibration
- Ethernet Configuration
  - Embedded
  - Data Server
- Geometrical Accuracy Test
- Machine Leveling
- Basic Alignments
  - ATC
  - Spindle
  - Turret
  - Tailstock
  - Steady Rest
- PMC Basics
  - Parameters
  - Status
  - Timer
  - Keep Relay
  - Ladder
- Servo / Spindle
  - Battery Replacement
  - Error / Alarms
  - Load monitoring
- Periodic Maintenance
  - Daily Checks
  - Quarterly Checks
  - Annual Checks
- Pre-Maintenance
  - ATC (Machining Center)
  - APC (Machining Center)
  - Tool Post (Turning Center)
  - Axis System
  - Spindle Head (Machining Center)
  - Table (Machining Center)
  - Head Stock (Turning Center)
  - Chuck & Cylinder (Turning Center)
  - Gear Box (Turning Center)
  - Air Service unit
  - Lubrication System
  - Hydraulic System
  - Oil Cooler Unit
  - Coolant and Chip C/V
  - Splash guards and covers
  - Electrical Cabinet