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We specialize in providing training courses in the field of broadly defined engineering techniques. Our main training sections are:

- Visualization and control systems
- Mechanical engineering
- Material engineering
- Production quality
- Industrial robots
- Production quality management
- Machinery safety
- SIEMENS PLM

We organize workshops, conduct consultations, implementation advice and support; we sell software and systems automation products, as well as run measurements and tests for specific purposes.

EMT-Systems has been operating on the training market for many years. We offer innovative approach to training engineers and technicians working in different branches of industry. Our courses are based on comprehensive programs focused on the needs of maintenance services and designers working with CAD/CAM/CAE software.

Participants of our courses will learn the most popular drivers of machine tools:

- Siemens
- Sinumerik
- Heidenhain
- Okuma
- Mazak
- Fanuc

They are often created to suit the specific requirements of the customer.

Trainings offered by EMT-Systems are the guarantee of high quality and professionalism resulting from years of experience in developing course programs for firms, public institutions, education units and individual clients. Success of our clients is our best recommendation.

Our mission is to conduct highest quality trainings for industrial personnel to help them adapt to modern jobs using innovative technologies.

We help to identify training needs of each participant and suggest the optimal course path for them. Through the comparison of initial and final tests' results we monitor the increase in knowledge and skills, which automatically allows us to prove the effectiveness of our work.

We are the authorized training partner of Siemens in the field of Sinumerik controllers and SinuTrain software courses.
QUALITY POLICY. PRIZES AND AWARDS

Quality policy
Prizes and awards

Because we are constantly improving the quality of our training services, we have implemented the Product Certification System according to the following standards:

- PN-EN ISO 9001:2015
- ISO 29990:2010

The awarded certificates encourage us to the constantly improve and update our services.

We have been a member of the Polish Chamber of Training Companies since June 2013. We are obliged to obey the regulations of the Code of Good Practice and use them in our everyday work. We have also signed the Training Service Standard document. We are driven by the rules of professional ethics and business integrity.

We have received numerous awards and prizes:

- 2018 Innovation Laurel for the training: Chemoset and thermoset polymeric composites - introduction to polymer chemistry, composite properties and manufacturing methods
- 2018 European Medal for all trainings in: „Industrial Robots”
- 2017 Training Company of the Year emblem received from Central Office of National Certification.
- 2017 European Medal for all trainings in: „Plastics”.
- 2016 Caesar of Silesian Business awarded at the solemn Business Centre Club gala.
- 2016 European Medal for the training „CNC1: CNC Operator/Programmer”.

The prestigious Highest Quality Gold Emblem 2016 a grand prix in the category Services in the most pro quality program in Poland, organized under the patronage of the Polish Agency for Enterprise Development, Polish Committee for Standardization and Polish Forum ISO 9000.

- 2016 Training Company of the Year emblem received from Central Office of National Certification.
- 2015 Enterprise of the Future.
- 2014 Training Company of the Year emblem received from Central Office of National Certification.


The award of the Marshal of the Silesian Voivodeship during the conference „Innowacja. Cię rozwija” Innosilesia.
EMT-Systems, TÜV NORD Polska, MEN, Siemens certificates

After the training course each participant acquires certificates descriptively confirming acquired skills according to implemented ISO 9001:2015 and ISO 29990:2010 TÜV NORD Polska procedures.

**EMT-Systems Certificates**
Each participant receives 6 certificates of completion prepared in different languages: polish, english, german, dutch, norwegian and swedish.

**MEN Certificates**
After the training, students also receive a certificate issued pursuant to § 18th paragraph. 2 of the Regulation of the Minister of National Education of 11th January 2012 on lifelong learning in school forms (Dz. U. of 2014, Pos. 622).

**TÜV NORD Certificates**
By taking the exam prepared by EMT-Systems and TÜV Nord Polska Sp. z o.o. participants have a chance to obtain an additional certificate confirming their knowledge and skills obtained during the training course they participated in. The document is prepared in three languages – Polish, English and German. If you are interested in taking the exam, please notify us in the application form. The cost of taking the exam and obtaining a certificate is 200 PLN. Acceptance of the offer is voluntary.

**Siemens CNC Training Partner Certificates**
Participants of out courses can also receive a Siemens Motion Control Poland Authorized Certificate. Interest in acquiring this certificate, cost of 300 PLN, shall be reported on the first day of the training. Participation in the certification process is voluntary. Full set of educational materials: training books and DVD, is included in certificate price.
Course symbol: CNC1

Course name: Operation and programming of numerically controlled machine tools - CNC operator

Course aims:
- Actual industrial use of numerically controlled machine tools based on the most commonly used in industry drivers FANUC, SINUMERIK, HAIDENHAIN and Okuma, used in turning and milling machining centers held in the Training Center; independent work with operating and programming of turning centers and CNC milling machines; product processing in accordance with the technological documentation; ability to control the current and final products; selecting and setting the tools and operating parameters of numerically controlled machine tools; developing and manually entering the NC programs; interpreting of existing programs and their editing; producing different machine parts on numerically controlled machines using developed machining program; knowledge of and correct interpretation of technical drawings; ability to use various measurement tools used by the CNC operator; ability to use the professional literature (library available during the course) relating to the selection of tools and machining parameters.

Course summary:
- Design record - basics of technical drawing in machining
- General information about designing technological processes
- Structure of a technological process
- Stages in designing technological processes
- Creating programs based on standardized language for writing orders for CNC machines (G-code)
- Setting coordinate origin of object on CNC
- Tool path analysis depending on the type of tool motion interpolation
- Control of the feed movement of the tool and the spindle speed
- FANUC QTC - discussion and practical work at the machine
- SINUMERIK 828D / 840D driver - discussion and practical work
- Setting the values of tools correction on the lathe
- Determining translocation of the zero point of the machined element
- Programming the machine using Sinumerik and Fanuc controllers
- Programming fixed cycles
- Machining simulation in the machine’s controller
- Manual mode
- Machining the element in the automatic mode
- Dimensions control
- Program modifications in the machine controller
- SINUMERIK 828D / 840D driver - discussion and practical work
- Setting the values of tools correction on the lathe
- Determining translocation of the zero point of the machined element
- Programming the machine using Sinumerik and Fanuc controllers
- Programming fixed cycles
- Machining simulation in the machine’s controller
- Manual mode
- Machining the element in the automatic mode
- Dimensions control
- Program modifications on the machine controller
- Polar coordinates
- Recording tool path with polar coordinates
- Practical work with the machine in polar coordinates
- Practical work with CNC machine to verify the acquired knowledge
- Designing milling operations according to customer’s wishes
- Programming milling operations according to customer’s wishes
- Engraving operation according to customer’s wishes
- Demonstration of G-code programming in SINUMERIK
- Training Summary

Duration: 5 days - 51 hours

Course type: Open training
CNC LATHE AND MILLING

Course symbol: CNC2

Course name: Designing technological processes - CNC technologist

Course aims:
- Designing technological processes of selected elements of machine parts using numerically controlled lathes and milling machines; learning about machining datum surface and their selection methods; selection of tools and mounting methods of the machined elements; practical skills of preparing operation sheets and machining manuals; correct selection of measuring instruments for technical inspection.

Course summary:
- Reading and analyzing execution drawings of the selected machine parts
- Selecting and setting machining datum surface
- Tolerances for linear and angular dimensions, taper tolerances
- Surface roughness
- Selection of cutting parameters
- Classification of mounting elements
- Introduction to technological documentation
- Selection of cutting parameters for the material and tools chosen for the machining process
- Preparing the process sheet for the turret
- Preparing the technical inspection form
- Overview of the workplace material assembly methods
- Preparing the machining program, performing a simulation
- Theoretical calculation of the machining time
- Creating the technological documentation for the milled element based on the executive drawing
- Division into operations and procedures
- Selection of tools for particular procedures with preparation of the frames and fixing elements
- Overview of the methods of tool assembly in the milling center magazine
- Overview of the methods of fixing the workpiece material on the milling table
- Preparing the machining program, performing a simulation
- Theoretical calculation of the machining time
- Starting the machining tools and preparing them for the realization of the prepared applications
- Tests of the program on machining tools and simulation of the machining process
- Producing the elements of machine parts on lathes and CNC milling centers
- Technical inspection, verification of the dimensions, tolerances and surface roughness
- Overview of the methods of performing tool corrections while using them
- Setting the operator to run the production process and providing essential guidelines to ensure the correct functioning of the machining tool in accordance with occupational health and safety regulations and performing the workstation inspection with regard to the manufactured elements

Duration: 5 days - 38 hours
Course type: Open training

Course symbol: CNC3

Course name: Writing programs for CNC machines - CAM programmer

Course aims:
- Rules for preparing the models for machining; designing machining processes (turning and milling); generating the right NC programs for the process of milling and turning; modeling and using the presented tools and functions; setting the coordinate systems; configuring machining processes; ways of simulating, observing and interpreting the results of each operation and process as well as the whole machining cycle.

Course summary:
- Basics
  - Basics of CNC technology
  - Explanation of the NX work environment
  - Opening and suitability of the models
  - Machining process - planning and management
  - Frezowanie:
    - Preparing the model
    - Preparing Manufacturing environment
    - Coordinate systems
    - Planning
    - Contour machining
    - Setting the tools for different milling and turning operations
    - Boring operations
    - Surface machining
  - Turning:
    - Preparing the model
    - Preparing the Manufacturing environment
    - Coordinate systems
    - Turning and boring
    - Boring operations

Duration: 5 days - 35 hours
Course type: Open training

Workstations: CNC laboratory allow:
- Working on actual industrial machines based on the most popular control systems – SINUMERIK and FANUC

More details on page 10-17
SPECIALIZED COURSES IN THE FIELD OF CNC MACHINES

CNC LATHE AND MILLING

Course symbol: CNC4-P

Course name: Operation and programming of the machine tools with HEIDENHAIN controller

Course aims: Unassisted operation of a CNC machine; performing setup tasks on a machine equipped with Heidenhain control; unassisted program creation on Heidenhain control; plain text programming.

Course summary:
- Working in a simulation environment Heidenhain iTNC Programming Station
- Introduction to the operation of Heidenhain controller, screen layout
- Controller modes of operation, switching modes, special keyboard
- Comparison of NC code in plain text and in ISO code
- Cutting tools and parameters, tool board and its relation with TOOL CALL function
- Basic interpolation functions L/C/CC/CR
- Contour programming with functions R0/RR/RL
- Simulation – program testing mode, functionality, different forms of preview, management
- Working with five-axis machining center DMU50MB, with Heidenhain iTNC530 control
- Elementary contour programming using Cartesian and polar coordinates in absolute, incremental and combined systems
- Using auxiliary functions RND/CHF for contour modification
- Special functions APPR/DEP in contour programming
- Drilling cycle programming
- Milling cycle programming pockets/pins/grooves
- Generating multiple cycles
- Manipulating coordinate systems: changing/shifting/rotating/scaling
- Using basic structures by calling external files CALL PRG

Course aims

Course summary

Duration: 3 days - 21 hours

Course type: Open training

Course symbol: CNC4-Z

Course name: Advanced operation and programming of CNC machine tools with HEIDENHAIN control

Course aims: Advanced operation of a CNC machine; using a multi-axis machine to practice setup and programming tasks with a measuring probe; plain text programming for multi-sided and five-axis machining using measurement systems.

Course summary:
- Working in a simulation environment Heidenhain iTNC Programming Station
- Controller modes of operation, switching modes, special keyboard
- Introducing hardware information, requirements, information management principles - detailed description of tool data
- Pre-adjustment of the system programmed on a machine using a touch probe
- Automatic adjustment of the measurement system, basic cycles
- Using a measurement probe for intermediate measurements (inspection of an object, inspection of a tool, measurement protocol)
- Developing and launching machining programs using advanced functions of the tool board
- Dimensional inspection, making corrections
- Measurement cycles for a touch probe working with inclined planes
- Programming five-axis machining – operating principles of a machine
- Five-axis functions M128, TCPC
- Inspection of path accuracy
- Programs from CAM systems, requirements, adaptation
- Machine parameters MP

Course aims

Course summary

Duration: 3 days - 21 hours

Course type: Open training
## CNC LATHE AND MILLING

### Course Name: Programming and operation of CNC machines with FANUC control system

**Course aims:**
- Writing machining programs based on FANUC controllers; writing machining programs for the milled and turned elements; design and operation of the numerically controlled machine tools; learning to operate the numerically controlled machines with FANUC control.

**Course summary:**
- Presentation of the FANUC simulator - NCGuide
- Presentation of preparatory functions „G“
- Presentation of miscellaneous functions „M“
- Introduction and presentation of the basic fixed cycles used in order to facilitate saving the machining program
- Introduction to programming, presentation of the structure of the main program
- Working with a simulator, creating machining programs for turned and milled elements with a possibility of using Manual Guide
- Working in manual mode JOG
- Working in semi-automatic mode MDA
- Machining program editing
- Making the element according to the drawing
- Dimensional inspection and potential tool correction
- Mounting machining tools „machine vice“ or other types of fixing elements
- Checking if the machining tools are securely mounted and adjusted using the indicator
- Fixing the machined elements with zero point adjustment
- Machining program edition with the possibility of using Manual Guide
- Executing the program according to the drawings
- Dimensional inspection and potential tool corrections

**Duration:** 3 days - 21 hours

**Course type:** Open training

**Workstations: CNCS**
Closed courses are conducted in customer’s site using customer’s machine park and open courses in our training center based on CNC machine with FANUC software.

**Workstations: CNC6**
Closed courses are conducted in customer’s site using customer’s machine park and open courses in our training center based on CNC machine with SINUMERIK software.

**More details on page 11-16**

### Course Name: Operation of CNC numerically controlled machines with SINUMERIK control system

**Course aims:**
- Writing machining programs based on SINUMERIK controllers; writing machining programs for the milled and turned elements; design and operation of the numerically controlled machine tools; learning to operate the numerically controlled machines with SINUMERIK control.

**Course summary:**
- Operation of CNC machine tools
- Starting the machine
- Tools installation
- Setting the values of tool compensation
- Determining translocation of the zero point of the machined element
- Programming the machine using SINUMERIK controller
- Programming fixed cycles
- Machining simulation in the machine’s controller
- Manual mode
- Machining the element in the automatic mode
- Dimensions control
- Program modifications in the machine’s SINUMERIK controller

In order to enable participants to practice their skills, it is necessary for the client to provide a machine tool, materials and cutting and measurement tools (calipers, micrometers, gauge blocks) as well as mounting elements adjusted to the type of the material provided.

It is also possible to machine the elements that will be further processed in the firm.

**Duration:** 3 days

**Course type:** Closed training

**Workstations: CNCS**
Closed courses are conducted in customer’s site using customer’s machine park and open courses in our training center based on CNC machine with SINUMERIK software.

**Workstations: CNC6**
Closed courses are conducted in customer’s site using customer’s machine park and open courses in our training center based on CNC machine with SINUMERIK software.

**More details on page 11-16**
SPECIALIZED COURSES IN THE FIELD OF CNC MACHINES

CNC LATHE AND MILLING

Course symbol: CNC7
Course name: Programming and operation of CNC machines with MAZATROL control system
Course aims: Writing machining programs based on MAZATROL controllers; writing machining programs for the milled and turned elements; design and operation of the numerically controlled machine tools; learning to operate the numerically controlled machines with MAZATROL control.
Course summary:
- Coordinate systems used in CNC machine tools, dimensioning methods, selecting and setting zero points
- Movement, preparatory, miscellaneous and auxiliary functions, structure of the machining program in ISO code
- Writing machining programs based on executive drawings of machine parts, program in ISO code
- Design of MAZAK machines, introduction and description of tools, tool compensation, entering cutting data, positioning the machined materials, setting zero points
- Practical exercises related to the above mentioned topics
- Introduction to dialog programming with MAZATROL
- Practice on the available MAZAK machines
- Practical examination testing skills of operating and programming CNC machine tools

In order to enable participants to practice their skills, it is necessary for the client to provide a machine tool, materials and cutting and measurement tools (calipers, micrometers, gauge blocks) as well as mounting elements adjusted to the type of the material provided.

It is also possible to machine the elements that will be further processed in the firm.

Duration: 4 days
Course type: Closed training

Course symbol: CNC8
Course name: Operating and programing CNC machines with OKUMA controller
Course aims: Design and operation principles of the machine tool with OKUMA control system; operating the controller; writing machining programs; writing machining programs for the milled/milled elements; design and operation of the CNC lathe/milling machine.
Course summary:
- Characteristics of the CNC machine
- Definition of numerical control
- Coordinate systems
- Tool measurement methods
- Element and tool measurement probes
- Programming tool movements (line, circle, helix)
- Subprograms
- Elements of parametric programming
- Tool radius compensation
- Machining cycles
- Transformation cycles
- Cutting parameters
- Exploitation of machining tools
- Operation modes of the machine tools
- Tools installation
- Tool measurement by means of the probe
- Tool measurement without the probe
- Setting machine datum surface
- Measurement probe cycles
- Probe calibration
- Writing programs in semi-automatic mode (MDI)
- Editor functions
- Program simulation
- Programming basic geometric elements
- Programming with the use of machining cycles
- Writing subprograms
- Parametric defining (Q variables)

Duration: To be arranged
Course type: Closed arranged

Course symbol: CNC9
Course name: Operating and programing CNC machines - tailored training
Course aims: We offer you a tailor-made training for firms that wish to train a particular group of employees. Subject and content of the course is individually arranged according to customer’s needs according to the information provided by the client.
Course summary:
- Design and operation principles of the machine tool with OKUMA control system; operating the controller; writing machining programs; writing machining programs for the milled/milled elements; design and operation of the CNC lathe/milling machine.

Duration: To be arranged
Course type: Closed training
### CONVENTIONAL MACHINE TOOLS

<table>
<thead>
<tr>
<th>Course symbol</th>
<th>OBR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course name</td>
<td>Operation of conventional machine tools</td>
</tr>
<tr>
<td>Course aims</td>
<td>Unassisted operation of the traditional machine tools – milling machines and lathes; ability to analyze technical documentation; ability to take correct industrial measurements.</td>
</tr>
</tbody>
</table>
| Course summary | • Presentation of course program  
• Overview of occupational safety and health regulations applicable in the laboratory of conventional machine tools  
• Basics of technical drawing  
• Analysis of technical documentation based on execution drawings  
• Creating machining plans, preparing machining instruction sheets for milled and turned elements  
• Overview of tools and fixing devices  
• Industrial metrology - use of measurement tools in practice  
• Introduction to design and operation of universal lathe  
• Methods of fixing the machines elements in lathes  
• Mounting hard and soft jaws in the lathe chuck  
• Verification of spindle runout  
• Mounting and setting cutting tools  
• Working with tailstock – mounting lathe chuck and rotating tailstock centre to the tailstock sleeve  
• Selection of cutting parameters in the process of turning  
• Transverse turning - face planning  
• Longitudinal centreless turning  
• Centre drilling  
• Longitudinal turning with rotating tailstock centre  
• Hole machining on the lathe, drilling, boring, reaming  
• Slotting and parting  
• External and internal thread cutting using cutting tool  
• Thread cutting using threading dies  
• Threading using taps and dies  
• Introduction to the design and operation of universal milling machines  
• Methods of fixing the tools in the collets  
• Overview of milling tool runout, runout control  
• Methods of fixing the machined elements to the milling machine table  
• Setting the fixing tools using indicators  
• Selection of cutting parameters depending on the type of performed tasks, machined material and used tools  
• Face milling, climb milling and conventional milling  
• Hole-making on a milling machine, drilling, boring, reaming  
• Threading using hand and machine taps  
• Groove milling  
• Contour milling using proper tools  
• Milling with end milling cutters and slitting saws  
• Groove and pocket milling  |
| Duration | 5 days - 41 hours |
| Course type | Open training |
Course name: Industrial metrology
Course aims: Practical knowledge in the field of industrial metrology; introduction to the design, operating principle and operation of basic measurement devices used in the industrial metrology; skills of unassisted measurement taking based on technical drawings; knowledge in the field of Coordinate Measuring Technique and the available measurement tools.
Course summary: - Measuring linear dimensions (using calipers – depth gauge – micrometer – sensor clock)
- Measurements of angles and tapered bores (using the angle gauge – depth gauge – micrometer – sensor clock – measuring ball – gauge block)
- Measurements of bores (using bore gauge with 2 point measurement – bore micrometer with 2 point measurement – bore gauge with 3 point measurement)
- Basics of measurement tools verification
- Introduction to the dimensional analysis
- Tolerancing – fits (characteristics of fits in terms of controlling the cooperating elements, calculations of fits)
- Characteristics of gear wheel measurements (such as cylindrical gears with parallel teeth). Overview of the tools (modular calipers, disc micrometer) and measurement methods
- Characteristics of measuring external threads. Tools and measurement methods
- Using measurement tools
- Measurement of the basic parameters of the gear wheel
- Measurement of the basic parameters of an external thread
- Basic principles of coordinate metrology.
- Measurements of regular geometry and measurements of free surfaces
- Nominal / real / observed / associated geometry - interpretation and occurring deviations.
- Coordinate measuring technique in measuring general and geometric tolerances
- Preparing measurements on the Coordinate Measuring Machine - selection of a stylus module - qualification - definition of the coordinate system
- Basics of measurements on the coordinate measuring machine
- Basics of measurements using the measuring arm

Course name: Coordinate measuring method
Course aims: Acquiring the knowledge of the Coordinate Measuring Method; coordinate Measuring Machine (CMM) construction; starting the CMM and software; autonomous conduct of basic geometries measurement; drafting the measurement protocol.
Course summary: - Introduction to the coordinate measuring technique
- Tools/measuring machines that are used in coordinate measuring technique
- Overview of a measuring machine design illustrated with the example of a Zeiss Accura machine
- Procedure of starting the software, e.g. Calypso, presentation of the interface and functions
- The first run of a measuring machine, creating measurement plan
- Point measurement vs scanning
- Coordinate systems - overview
- Definition and creation of measuring stylus systems: mounting and their definition in Calypso
- Methods of replacing stylus systems – manual/automatic
- Functionality of magazines and their use; definition of the position of slots in the operating space of the machine
CNC machining laboratory

Our training rooms allow you to work with real industrial machines with the state-of-the-art control systems – SINUMERIK, FANUC, Heidenhain and OKUMA.

- Center adapted to efficient mass production of parts
- Telescopic covers of the X, Y, Z axes guideway
- Elements to set up the machine at the workplace
- Screw roller gearboxes in all 3 axes - direct drive from the engine
- The lighting installation

- Two air-conditioned and spacious training rooms
- Total area of about 150m²
- 8 industrial machining centers
- Access to the latest tool catalogs
- Cameras displaying current operation of the machines on monitors

SINUMERIK 828D driver – Machining Center WAFO MMY450

- Instalacja chłodzenia narzędzia
- Carousel tool magazine for 10 tools, HSK-A63 spindle end
- Precision ball screws in 3 axes
- Chain type chip conveyor with a bath
- SINUMERIK 828
Precision of the machining process on machining center R550 is guaranteed by using in the spindle system super-precision bearings; clearance-free ball screw drives for feed in axes X, Y and Z positioned on bearings with high axial rigidity. Rotation of the spindle, as well as feed rate has stepless regulation and are programmable.

- 3-axis interpolation
- Roller screws lubricated with grease
- Installation of tool water cooling system
- 16 – tool disc type tool magazine
- Guide rails with telescopic covers
- Closed operating space
- Graphic programming support - predefined machining cycles
- Rigid tapping – with no compensation holder

**Fanuc 0iTF Manual Guide - R550 „Harnaś“ vertical machining center**

**SINUMERIK 828D - Machining Center NXV560A - YCM**

- Machining center for efficient serial production of parts
- Spindle 18.8 kW / 1200 rpm with taper BBT40
- 20-tool automatic tool changes
- Work lamp, manipulation lamp
- Spindle taper blow-out
- Overpressure inside the spindle
- Cooling tools with compressed air
- Leveling blocks

- Central lubrication system
- Cooling control cabinet
- System of feeding the coolant to the working space
- Spindle coolant ring
- Rigid tapping
- Compressed air gun
- Chip wash gun
GE FANUC 0i Mate-TD driver - lathe WAFO TMK 25

- The lathe designed for efficient mass production of parts
- Fanuc 0i-mate control
- Hitachi inverter
- Transit hydraulic chuck Φ = 160
- Cooling and lighting installation
- Closed Workspace
- 6-position toolhead

SINUMERIK 840D – Lathe Spinner SB

- High-precision turning in the micron range
- Positioning repeatability < 0.4 µm
- Measuring system resolution - 0.1 µm
- ETA+ ball screws with improved efficiency
- High precision spindle bearing
- Tool storage capacity 8
- Driven tool holders
- Max. rotational speed 8000 rpm
- Spindle power 7.7 kW
- Through spindle
- Max. diameter 250 mm
- Max. turning length 285 mm

FANUC 0iMD – STCNC3D milling machine

- Working field: X = 500 mm, Y = 700 mm, Z = 180 mm
- Max. diameter of a rotary tool = 8 mm
- Max speed of rapid movement – function G0 = 4000 mm/min; max. feed rate – function G1 = 1 – 3000 mm/min
- Fluid cooled spindle 2.2 kW
- Max. table load = 20 kg
CNC MACHINING LABORATORY

SINUMERIK 828D - CNC CKT 400 x 700 lathe

- Flat-bed lathe
- Max. turning diameter over bed 400 mm
- Max. length of the element - 700 mm
- Max. rotational speed of the spindle 1800 rpm
- Positioning accuracy - 0.01
- Tool storage capacity 6
- Spindle power 5.5 kW

SINUMERIK 808D driver - CNC lathe with a 6-tool revolver - STCNC3D milling machine

- 6 tools head type revolver
- 3 jaw fi80 handle
- Complete electronics for 3 axes

Students also have access to:

- OKUMA OSP-P300S – turning and milling center OKUMA MULTUS with innovative features: Thermo-Friendly Concept, Collision Avoidance System, Machining Navi

CNC4 - basic and advanced course

Participants of the CNC4 training courses work with the modern, five-axis machining center DMU60MB with Heidenhain iTNC530 control.

Heidenhain iTNC530 control is a versatile, workshop-oriented contouring control for milling, drilling and boring machines as well as machining centers.

Students have at their disposal a controller keypad enabling programming, testing and optimizing smart.NC (only with iTNC 530). HEIDENHAIN conversational or DIN/ISO programs. A programming station substantially reduces machine idle times. The programming station is equipped with the same keyboard unit as at the machine.
Participants of our courses have access to the latest measuring device from series „smile“ by ZOLLER. It features all essential functions for professional measurement and presetting of tools and a new technology of software support. A state-of-the-art ZOLLER myTouch user interface is currently the only such solution worldwide designed for tool measuring and presetting. It is characterized by a very simple, improved touch-screen operating technology inspired by the latest human-machine communication solutions. A robust design made it possible to situate the device directly by CNC machining centers.

Standard functions of the device:
- Dynamic memory management for at least 15,000 adapters and tool steps
- Concentricity measurement of cutting edges
- Projector function
- Measuring process “biggest cutting edge”
- Tool step management
- Graphical user interface
- Automatic recognition of cutting edge shape and measuring range
- Dynamic cross-hairs
- Dimmable cutting edge inspection
- Real time measurement
- mm / cal conversion
- Independent selection between radius, diameter, absolute value, differential measure, incremental dimension and counter stop mode for both axes
- Automatic zero point monitoring
- Analog, colour focus meter
- Navigation system »compass« for comfortable axis adjustment and positioning of nominal value
- »Crisi« function for measuring the maximum contour
- Label printing

Tools

Equipment and accessories available at working stations:

- Measuring instruments:
  - calipers
  - micrometers
  - altimeter
  - rulers
  - gauge blocks

- Demonstration tools:
  - cutters
  - drills
  - taps
  - turning tools with indexable inserts
  - folding tools
  - special tools
  - cutter heads
During the course, each participant has at their disposal INDIVIDUAL WORKSTATIONS with a touch LCD monitor and specialized software that simulates the work with real drivers:

- Siemens SinuTrain Operate
- FANUC NC GUIDE
- HEIDENHAIN simulator
- NX CAM – aided machining

Siemens SinuTrain Operate - SinuTrain Operate 4.5 SP2 is not only a training program, but also allows for programming CNC control SINUMERIK offline, due to the fact that it is based on the same system SINUMERIK Operate. It is therefore an ideal tool for the operator, technologist and setter of the CNC machine.

NC Guide - actual simulator of the FANUC operator panel.

HEIDENHAIN - Actual simulator of the HEIDENHAIN operator panel

NX CAM - aided machining.
Software offers a wide variety of functions, from simple NC programming to high performance and multiaxis machining, allowing realization of many tasks using just one system. NX software is applied in many branches of industry successfully fulfilling its role in aviation, automotive industry, medical equipment, foundry industry and machinery.
Conventional machining laboratory

Nasze sale szkoleniowe zapewniają możliwość pracy na rzeczywistych obrabiarkach przemysłowych. Do dyspozycji kursantów oddajemy:

- CORMAK 410×1000/1500 lathe
- CORMAK TURN 410×1000 PREMIUM LINE lathe
- MAKTEK XZ 6350ZB milling and drilling machine
- XL5030 (UWF 125 Servo) milling and drilling machine
May be used for many tasks, such as internal and external surface turning, taper turning, polishing, modular and DP threading, drilling and internal broaching.

Machine characteristics:
- Digital readout in 3 axes
- Modern and precise spindle bearing
- Large 52 mm spindle bore
- Solid cast iron bed construction, induction-hardened and ground
- Hardened and ground gears used in the machine
- Bigger machining possibilities due to removable filler block
- Protective covers compliant with the most recent standards
- Machining accuracy: circularity deviation below 0.01 mm, cylindricality deviation no more than 0.02 mm for measurement of 200 mm long, ideal surface finish
- Emergency foot brake
CORMAK TURN 410 x 1000 PREMIUM LINE lathe

Machine characteristics:
- Large covers of the lathe chuck and operating space
- Integrated cooling system
- Removable filler block enables machining large diameter elements
- Solid cast iron bed construction, induction-hardened and precisely ground
- Main arbor with ball bearings
- Precise feed rate and spindle revolution regulation
- Highly torsion-resistant and vibration-resistant machine bed, which enables precise machining

MAKTEK XZ 6350ZB milling and drilling machine

- Machine equipped with vertical head and horizontal spindle
- Tool mount taper ISO 40
- Machine with working feeds in X and Y axes and quick setting feed in Z axis
- Vertical head moved out spindle
- Power feed within 3 ranges and possibility of automatic threading
- Vertical swivel head within 0-90°
- Extended and swivel upper beam
XL5030 (UWF 125 Servo) milling and drilling machine

- Table size: 1270×300 mm
- Max. table travel [XYZ]: 720/300/400
- Distance from spindle nose to work surface: 35-435 mm
- Spindle hole taper 7:24 ISO40
- Rapid speed of table: 1000/1000/750 mm/min
- Table speed: variable
- Spindle speed range (12): 35-1500 revolutions/min
- Engine power: 3 kW
- Servomotor: 10 Nm
- Size: 1720x1680x1810 mm
- Weight: 1500 kg
Participants of the training course have at their disposal the following tools used in industrial metrology:

- calipers
- micrometers
- depth gauges
- altimeters
- sensor clocks
- gauge blocks
- measuring balls
- measuring rollers
ZEISS ACCURA coordinate measuring machine

- Measurement range of the device: 900x1200x700mm
- Measurement uncertainty MPE_P=1.7um
- Faster selection of the optimal solution and saving of costly retooling of the machine thanks to using the MASS system (Multi Application System Sensor)
- MASS allows using both active scanning central head, heads that can be mounted in the tilting rotary joints with passive scanning head, as well as optical scanning heads
- It features scanning measuring head Zeiss VAST-XT
MCAX measuring arm with scanning head MMDx100.

- Measurement range: 2 m
- Point repeatability: +/- 30 um
- Capacity accuracy: 42 um
- Measurement probes: 15 mm, 6 mm, 3mm
- The device is fitted with a laser scanner (scanning head)
- Max. speed of gathering points, min. 50000 points/s
Our trainers are experienced programmers and operators with many years of work experience and examiners of the regional examination committees in the profession cutting machine operator. They often work for industrial plants in the programming and operation of numerically controlled machine tools, as well as conducting training courses. Designers and engineers implementing NX CAM systems.

In addition, they provide consulting services and work as experts for renowned trade periodicals.

During trainings, their main focus is on passing knowledge of the real examples they have encountered in their professional work.

Our trainers are open to all suggestions made by the participants. It is very common that during trainings the group discusses the issues beyond the scope of the standard program that cover specific aspects of the students work.

Completed courses also lead to cooperation between EMT Systems and representatives of industrial facilities in the following areas: projects, modernization and commissioning lines.
Training Areas

Mechanical Engineering
- Industrial Pneumatics
- Power Hydraulics
- Training courses in Operating and Programming CNC lathe and milling machines
- Conventional Machine Tools
- Mechanical Engineering
- Machine Diagnostics

Production Quality
- Quality Management
- Metrology
- Analysis of Measurements
- Quality Management Systems

Visualization and Control Systems
- Electrical Engineering and Automation
  - SIEMENS S7-300/400
  - SIEMENS S7 Migration STEP 7 - TIA Portal
  - SIEMENS S7-300/400 TIA Portal
  - SIEMENS S7-1200 TIA Portal
  - SIEMENS S7-1500 TIA Portal
  - SIEMENS S7-SCL/GRAPH in TIA Portal
  - SIEMENS Safety Integrated
  - SIEMENS S7-SCL/GRAPH w TIA Portal
  - SIEMENS Safety Integrated
- HM/SCADA
- Industrial Networks
- SIMATIC PCS7
- CODESYS
- Drive Systems
- Industrial Sensors
- C/C++ Programming

Industrial Robots
- FANUC
- ABB
- KUKA
- WITTMANN
- COMAU
- Industrial Robots Integration

Material Engineering
- Plastics
- Polymer Composites
- 3D Printing
- Heat Treatment
- Casting
- Plastic Forming
- Resistance Welding

Machinery Safety
- Standards and Directives for Machinery
- Safety Systems

Production Quality Management
- Total Productive Maintenance
- SMED Methodology
- FMEA Methodology
- Lean Manufacturing

SIEMENS PLM
- SIEMENS NX
- SIEMENS Solid Edge

SIEMENS PLM Software
- Siemens NX
- Siemens SPOED EDGE
- Siemens FEMAP
- Siemens FIBERSIM
- Siemens TECNOMATIX
- Siemens TEAMCENTER
Our partners:

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