LIST OF COURSES
INDUSTRIAL PNEUMATICS
- P1: Pneumatics - basic course
- P2: Industrial electropneumatics
- P3: Design and simulation of pneumatic and electropneumatic systems
- P4: Basics of vacuum technology
- P5: Industrial pneumatics according to client's individual needs (c)

POWER HYDRAULICS
Stationary hydraulics
- H1: Power hydraulic components and systems - construction and operation
- H2: Hydraulic drives and control systems in machines and devices
- H3: Proportional hydraulics and electrohydraulics
- H4: Servohydraulic drives and control systems
- H5: Diagnostics, maintenance and repairs of hydraulic devices and systems
- H6: Design of hydraulic drives and control systems
- H7: Energy efficiency of hydraulic drives
- H8: Servohydraulic drives: modeling, identification, control (c)

Mobile hydraulics
- HM1: Mobile hydraulics in machines and devices
- HM2: Hydraulic drives and control systems in mobile hydraulics
- HM3: Basics of IQAN control system (c)

Hydraulic fluid
- HC1: Hydraulic fluid parameters - control and analysis

Hydrotronics
- HT1: Hydrotronics - basic course (c)
  - HT2: Hydrotronics - advanced course (c)

MACHINE DIAGNOSTICS
- DM1: Vibrodiagnostics with elements of utilization - level 1
- DM2: Vibrodiagnostics of industrial systems - level 2
- DM3: Advanced diagnostic methods - level 3 (c)
- DM4: Thermographic diagnostics (c)

CONVENTIONAL MACHINE TOOLS
- OBR: Operation of conventional machine tools

MECHANICAL ENGINEERING
Maintenance
- PKM1: Basics of machine construction for mechanics
- PKM2: Design and utilization of bearings
- PKM6-UR: Vibratory feeders for maintenance
- PKM8: Hydraulic, pneumatic, rotary and static seals

Engineers
- PKM3: Technical drawing
- PKM4: Geometric dimensioning and tolerancing ISO-ASME/GD&T with coordinate techniques
- PKM5: Basics of machine construction for construction engineers
- PKM6-K: Designing vibratory feeders
- PKM7: Technical mechanics - maintenance (c)

Specialized trainings
- CNC5: Programming and operation of CNC machines with FANUC control system
- CNC6: Operation of CNC machines with SINUMERIK control system (c)
- CNC7: Programming and operation of CNC machines with MAZATROL control system (c)
- CNC8: Operating and programming CNC machines with OKUMA control system (c)
- CNC9: Operating and programming CNC machines according to client's individual needs (c)

MACHINES AND MILLING MACHINES
Trainings for CNC programmers and operators
- CNC1: Operation and programming of numerically controlled machine tools - CNC operator
- CNC2: Design of technological processes - CNC technologist / tool setter
- CNC3: Computer aided manufacturing - CAM programmer
- CNC4-P: Operation and programming of the machine tools with HEIDENHAIN control
- CNC4-Z: Advanced operation and programming of CNC machine tools with HEIDENHAIN control

(c) - closed training
**ELECTRICAL ENGINEERING AND AUTOMATION**

- **AM1:** Electrical engineering and control cabinet equipment
- **AM2:** Introduction to industrial automation and control systems
- **AM3:** Safety systems and devices in industrial automation
- **NAP1:** Basics of drive systems

**VISION SYSTEMS**

- **SW1:** Industrial 2D and 3D vision systems

**SIEMENS S7-300/400**

- **PLC 1:** SIEMENS SIMATIC S7-300/400 programming – basic course
- **PLC 2:** SIEMENS SIMATIC S7-300/400 programming – advanced course
- **PLC 3:** SIEMENS SIMATIC S7-300/400 – diagnostics
- **PLC 4:** PROFINET DP – SIEMENS SIMATIC S7-300/400 communication
- **PLC 5:** S7-GRAF sequence programming
- **PLC 6:** S7-SCL programming

**SIEMENS S7 MIGRATION STEP7- TIA PORTAL**

- **TIAM1:** STEP7 to TIA Portal project migration
- **TIAM2:** Operating and programming S7-1500 controllers in TIA Portal for STEP7 users

**SIEMENS S7-300/400 TIA PORTAL**

- **TIA2:** PLC SIEMENS SIMATIC S7-300/400 programming in TIA Portal – basic course
- **TIA3:** PLC SIEMENS SIMATIC S7-300/400 programming in TIA Portal – advanced course

**SIEMENS SIMATIC S7-1500 / S7-1200 TIA PORTAL**

- **TIA1:** Operating and programming S7-1500 controllers in TIA Portal for STEP7 users
- **TIA1200-1:** SIEMENS SIMATIC S7-1200 programming in TIA Portal – level 1
- **TIA1200-2:** SIEMENS SIMATIC S7-1200 programming in TIA Portal – level 2
- **TIA1500-1:** SIEMENS SIMATIC S7-1500 programming – level 1
- **TIA1500-2:** SIEMENS SIMATIC S7-1500 programming – level 2
- **TIA-DIAG:** SIEMENS SIMATIC S7-1500/1200 diagnostics in TIA Portal – level 3
- **TIA-EKSPERT:** Technological functions and advanced programming of SIMATIC S7-1500/1200 in TIA Portal

**SIEMENS SAFETY INTEGRATED**

- **SAF1500:** Programming and designing in Step 7 Safety Advanced in SIMATIC Safety Integrated S7-1500 controllers
- **TIA-SCL:** S7-SCL programming in TIA Portal
- **TIA-STL:** S7-STL programming in TIA Portal
- **TIA1500-T:** Motion Control functions of S7-1500T controller

**HMI/SCADA**

- **TIAW1:** WinCC HMI Panels in TIA Portal
- **TIAW2:** WinCC SCADA in TIA Portal
- **W1:** WinCC SCADA
- **W2:** WinCC flexible – Operator panels
- **W3:** PM-Server / PM-Quality – Configuration and administration

**INDUSTRIAL NETWORKS**

- **SP1:** AS-Interface
- **SP2:** PROFIBUS DP diagnostics
- **SP3:** PROFINET S7
- **SP3-TIA:** PROFINET in TIA
- **SP3-DIAG:** PROFINET diagnostics
- **SP4:** CAN and CANopen
- **SP5:** AS/ I S7 automation systems integrator

**SIMATIC PCS7**

- **PCS7-UR:** SIMATIC PCS7 in maintenance
- **PCS1:** SIMATIC PCS7 – basics of developing applications

**CODESYS**

- **CDS1:** CoDeSyS 2.3 – PLC programming
- **CDS2:** CoDeSyS 3.5 – PLC programming

**DRIVE SYSTEMS**

- **NAP1:** Basics of drive systems

**SIEMENS DRIVE SYSTEMS**

- **TNS1-TIA:** SIEMENS Sinamics G120 in TIA Portal – configuration, starting and diagnostics
- **TNS1:** SIEMENS Sinamics G120
- **TNS2:** SIEMENS Micromaster 4 drive systems
- **TNS3-TIA:** Siemens Sinamics S120 in TIA Portal – configuration, launch and diagnostics
- **TNS3:** SIEMENS Sinamics S120 – configuration, launch, diagnostics
- **TNS4:** SIEMENS Simotion – configuration, launch, diagnostics
- **TIA1500-T:** Motion Control functions of S7-1500T controller
**INDUSTRIAL ROBOTS**

- **FANUC ROBOTS**
  - **RF1**: FANUC industrial robots programming - level 1
  - **RF2**: FANUC industrial robots programming - level 2
  - **RF3**: FANUC off-line industrial robots programming - Roboguide
  - **RF-M**: Migration to operation and on-line programming of FANUC industrial robots (c)

- **ABB ROBOTS**
  - **RA1**: ABB industrial robots programming - level 1
  - **RA2**: ABB industrial robots programming - level 2

- **KUKA ROBOTS**
  - **RK1**: KUKA industrial robots programming - level 1
  - **RK2**: KUKA industrial robots programming - level 2
  - **RK-I**: The integration of KUKA robots and PLC SIEMENS SIMATIC controller

**YASKAWA ROBOTS**

- **RY1**: YASKAWA industrial robots programming - level 1
- **RC**: YASKAWA industrial robots programming and operation (c)

**COMAU ROBOTS**

- **RC**: YASKAWA industrial robots programming and operation (c)

**INDUSTRIAL ROBOTS INTEGRATION**

- **RK-I**: The integration of KUKA robots and PLC SIEMENS SIMATIC controller
- **RI2**: The integration of KUKA / ABB robots and SINUMERIK controlled CNC machine

**MITSUBISHI**

- **MTB1**: MITSUBISHI MELSEC-FX series logic controllers programming
- **MTB2**: MITSUBISHI MELSEC-Q series logic controllers programming (soon)

**C AND C ++ PROGRAMMING**

- **PR1**: C/C++ programming (c)
- **PR2**: Programming AVR and ARM microcontrollers using Arduino platform and Atmel Studio (c)
- **PR3**: Object-oriented programming in C/C# – basic course (c)
- **PR4**: Programming of STM3 microcontrollers with the use of HAL and CMSIS libraries and FreeRTOS system – basic course (c)

**MATERIAL ENGINEERING**

**INDUSTRIAL SENSORS**

- **S1**: Sensors in industrial applications
- **S2**: IO-Link interface – quick reconfiguration of the sensor process parameters
- **S3**: Industrial sensors according to client's needs (c)

**YASKAWA ROBOTS**

- **RY1**: YASKAWA industrial robots programming – level 1
- **RC**: YASKAWA industrial robots programming and operation (c)

**PLASTICS**

- **TS1**: Plastics and their properties
- **TS2**: Designing components made of plastics
- **TS5**: Designing injection moulds

**Design**

- **TS2**: Designing components made of plastics
- **TS5**: Designing injection moulds

**Processing of thermoplastics**

- **TS3**: Thermoplastic injection moulding – operating and technology
- **TS4**: Plastics processing – extrusion (c)
- **TS7**: Blow Moulding (c)

**Tool shop and technical service**

- **TS6**: Exploitation of injection moulds

**POLYMER COMPOSITES**

- **KP1**: Chemoset and thermoset polymeric composites – introduction to polymer chemistry, composite properties and manufacturing methods
- **KP2**: Technical evaluation of the quality of polymer composites

**3D PRINTING**

- **3D1**: 3D printing in FDM technology – basic course
- **3D2**: 3D printing in FDM technology – advanced course
- **3D3**: 3D printing technologies

**HEAT TREATMENT**

- **OC-O**: Heat treatment of metal engineering materials
- **OC-2**: Heat treatment according to client's needs (c)
STANDARDS AND DIRECTIVES FOR MACHINERY
- BM1: The assessment of conformity of machines and devices against the requirements of applicable directives (terms of CE marking)
- BM2: Machine and device operation (according to 2006/42/WE and 2009/104/WE directives)
- BM4: The construction and operation of technical devices applied in potentially explosive atmospheres (requirements of directives ATEX (2014/34/EU) and Ex (1999/92/EC))
- BM5: Declaration of conformity and CE marking (requirements of directive 2014/35/EU and related regulations)

SAFETY SYSTEMS
- SAF300: Programming and designing with Distributed Safety in SIMATIC Safety Integrated Controllers
- SAFI500: Programming and designing in Step 7 Safety Advanced in SIMATIC Safety Integrated S7-1500 controllers

QUALITY MANAGEMENT
- KJ1: Quality management and quality ethics
- KJ2: Computer-aided quality assurance – CAQ
- KJ3: MSA – Measurement System Analysis
- KJ4: SPC – Statistical Process Control
- KJ5: 3D scanning for dimensional inspection, SPC and CAQ

METROLOGY
- MR1: Industrial metrology
- MR2: Coordinate measuring method
- MR3: Compilation of measurement results

ANALYSIS OF MEASUREMENTS
- AP1: Descriptive statistics
- AP2: Measurement uncertainty calculation
- AP3: Compilation of measurement results
- AP4: Legal metrology and arranging a research laboratory and a calibration laboratory

TOTAL PRODUCTION MAINTENANCE
- TPM1: Maintenance management according to TPM and TOC
- TPM2: Maintenance management according to TPM – level 2
- TPM3-P: TPM Leader: how to manage maintenance department – basic course
- TPM3-Z: TPM Leader: how to manage maintenance department – advanced course
- TPM4: Process optimization in maintenance
- TPM5: Statistical methods in TPM
- TPM6: Developing KPI factors in maintenance
- TPM7: Cost management in maintenance

PLASTIC FORMING
- OP1: Press-forming: basic course
- OP2: Press-forming according to client's needs

RESISTANCE WELDING
- ZO1: Programming and parameterization of resistance welding machines – basic course
- ZO2: Programming and parameterization of resistance welding machines – advanced course
- ZO3: Programming of BOSCH adaptive welding controllers – specialist course
- ZO4: Programming of ARO adaptive welding controllers – specialized course
- ZO5: Basics of resistance microwelding theory
SMED METHODOLOGY

- **SMED1:** Single-Minute Exchange of Die
- **SMED2:** Methods Time Management in Single-Minute Exchange of Die

FMEA METHODOLOGY

- **FMEA1:** Machinery Failure Mode and Effects Analysis
- **FMEA2:** PFMEA - Process Failure Mode Effects Analysis (4th edition, June 2008 by AIAG)
- **FMEA3:** Design Failure Mode Effects Analysis (4th edition, June 2008 by AIAG)
- **FMEA4:** FMEA-MSR – FMEA for Monitoring and System Response (1st edition by AIAG & VDA QMC, June 2019)
- **FMEA5:** PFMEA - Process Failure Mode and Effects Analysis (1st edition by AIAG & VDA QMC (5th by AIAG), June 2019) (c)
- **FMEA6:** DFMEA - Design Failure Mode Effects Analysis (1st edition by AIAG & VDA QMC (5th by AIAG), June 2019) (c)

LEAN MANUFACTURING

- **LEAN1:** Lean management – basic course (c)
- **LEAN2:** Workplace organization with 5S method (c)
- **LEAN3:** VSM and process optimization (c)
- **LEAN4:** Planning and organization of the production (c)
- **LEAN5:** Workplace organization with 5S method (c)

BUILDING AUTOMATION

- **AB1:** Electrical installations in residential and commercial buildings (soon)
- **AB2:** Intelligent building automation (soon)

SIEMENS NX

- **NX CAD1:** Basic course
- **NX CAD2:** Intermediate course
- **NX CAD3:** Migration course (c)
- **NX CAD4:** Advanced course (c)
- **NX CAM1:** Basic course
- **NX CAM2:** Turning (c)
- **NX CAM3:** Milling (c)
- **NX CAM4:** Multi axis milling (c)
- **NX DW:** Die Wizard – die tools (c)
- **NX SM:** Sheet metal (c)
- **NX D:** Drafting (c)
- **NX MFF:** Freeform Modeling
- **NX AS:** Advanced Simulation (c)
- **NX LM:** Laminat Modeling (c)
- **NX MS:** Motion Simulation (c)
- **NX:** NX Selection (c)

SIEMENS SOLID EDGE

- **SE1:** Solid Edge – practical basics of programming
- **SE2:** Solid Edge – advanced design aid