LIST OF COURSES
### INDUSTRIAL PNEUMATICS
- **P1**: Pneumatics - basic course
- **P2**: Electropneumatics - basic course
- **P3**: Design and simulation of pneumatic and electropneumatic systems
- **P4**: Basic principles of vacuum technology (c)
- **P5**: Industrial pneumatics according to client’s individual needs (c)

### POWER HYDRAULICS
**Stationary hydraulics**
- **H1**: Basics of power hydraulics
- **H2**: Hydraulic drives and control systems in machines and devices
- **H3**: Proportional hydraulics and electrohydraulics
- **H4**: Design of hydraulic drives and control systems
- **H5**: Maintenance and repairs of hydraulic devices and systems
- **H6**: Servo-hydraulic drives: modeling, identification, control (c)
- **H7**: Power hydraulics according to client’s individual needs (c)

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

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

### CNC LATHES AND MILLING MACHINES
**Trainings for CNC programmers and operators**
- **CNC1**: Operation and programming of numerically controlled machine tools - CNC operator

**Specialized trainings**
- **CNC2**: Design of technological processes - CNC technologist
- **CNC3**: Writing programs for CNC machines - 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

**Conventional machine tools**
- **OBR**: Operation of conventional machine tools (c)

### Metrology
- **MR1**: Industrial metrology

### MECHANICAL ENGINEERING
**Maintenance**
- **PKM1**: Basics of machine construction for mechanics
- **PKM2**: Design and utilization of bearings

**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**: Designing gears (c)
- **PKM7**: Technical mechanics - maintenance (c)

### Diagnostics and vibroacoustics
- **DM1**: Vibrodiagnostics with elements of utilization - basic course
- **DM2**: Machine diagnostics based on spectrum analysis of vibration signals - intermediate course
- **DM3**: Advanced diagnostic methods
- **DM4**: Thermographic diagnostics (c)
VISUALISATION AND CONTROL SYSTEMS

SIEMENS S7-300/400
- PLC1: SIEMENS SIMATIC S7-300/400 programming - basic course
- PLC2: SIEMENS SIMATIC S7-300/400 programming - advanced course
- PLC3: SIEMENS SIMATIC S7-300/400 - diagnostics
- PLC4: PROFIBUS DP - SIEMENS SIMATIC S7-300/400 communication
- PLC5: S7-GRAPH sequence programming
- PLC6: S7-SCL programming

SIEMENS S7-300/400 TIA PORTAL
- TIA1: Project migration from STEP 7 to 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 S7-1200 TIA PORTAL
- PLC9: SIEMENS SIMATIC S7-1200 programming in TIA Portal - basic course
- PLC10: SIEMENS SIMATIC S7-1200 programming in TIAPortal - advanced course

SIEMENS S7-1500 TIA PORTAL
- TIA1500-E: TIAPortal EKSPERT - programming controllers S7-1500
- TIA1500-1: SIEMENS SIMATIC S7-1500 -programming - basic course
- TIA1500-2: SIEMENS SIMATIC S7-1500 -programming - advanced course
- SAF1500: Programming and designing in Step 7 Safety Advanced in SIMATIC Safety Integrated S7-1500 controllers

SIEMENS SAFETY INTEGRATED
- SAF300: Programming and designing with Distributed Safety in Simatic Safety Integrated Controllers
- SAF1500: Programming and designing in Step 7 Safety Advanced in SIMATIC Safety Integrated S7-1500 controllers

HMI/SCADA
- W1: WinCC SCADA
- W2: WinCC flexible

INDUSTRIAL NETWORKS
- SP1: AS-Interface
- SP2: PROFINET diagnostics
- SP3: PROFINet
- SP4: CAN and CANopen
- SP5: Automation systems AS-I/S7 Integrator (c)
- PLC4: PROFIBUS DP - SIEMENS SIMATIC S7-300/400 communication

SIMATIC PCS7
- PCS7-UR: SIMATIC PCS7 in maintenance
- PCS1: SIMATIC PCS 7 - basics of creating applications

CODESYS
- CDS1: CoDeSyS 2.3 - PLC programming
- CDS2: CoDeSyS 3.5 - PLC programming (c)

DRIVE SYSTEMS
- NAP1: Basics of drive systems

SIEMENS DRIVE SYSTEMS
- TNS1: SIEMENS Sinamics G120
- TNS2: SIEMENS Micromaster 4
- TNS3: SIEMENS Sinamics S120 - configuration, launch, diagnostics
- TNS4: SIEMENS Simotion - configuration, launch, diagnostics

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 individual needs (c)

MITSUBISHI
- MTB1: Programming MITSUBISHI logic controllers, MELSEC-FX series

C AND C++ PROGRAMMING
- PR1: C/C++ programming
- PR2: C language programming of AVR microcontrollers
**INDUSTRIAL ROBOTS**

**FANUC robots**
- RF1: On-line programming of FANUC industrial robots - basic course
- RF2: On-line programming of FANUC industrial robots - advanced course

**ABB robots**
- RA: Operation, programming and starting ABB robots

**KUKA robots**
- RK1: Programming industrial robots KUKA - basic course
- RK2: Programming industrial robots KUKA - advanced course

**Industrial Robots Integration**
- RI1: The integration of KUKA / ABB robots and PLC Siemens SIMATIC controller
- RI2: The integration of KUKA / ABB robots and SINUMERIK controlled CNC machine

**MATERIAL ENGINEERING**

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

**HEAT TREATMENT**
- OC1: Heat treating of metals
- OC2: Basic heat treatment (c)
- OC3: Chemothermal treatment (c)
- OC4: Thermal methods of producing surface layers (c)
- OC5: Heat treatment technology for machine parts and tools (c)
- OC6: Heat treatment disadvantages and quality control (c)
- OC7: Equipment for heat treatment processes (c)

**CASTING**
- OD1: Basics of casting technology (c)
- OD2: Casting metal alloys and smelting methods (c)
- OD3: Modern technologies of cast production (c)
- OD4: Defects of castings and prevention techniques (c)
- OD5: Resource and waste management in a foundry (c)

**PLASTIC FORMING**
- OP1: Extrusion - basic course
- OP2: Extrusion according to client’s individual needs (c)

**RESISTANCE WELDING**
- ZO1: Programming and parameterization of resistance welding machines - basic course (c)
- ZO2: Programming and parameterization of resistance welding machines - advanced course (c)
- ZO3: Programming BOSCH adaptive weld controllers - specialist course (c)
- ZO4: Programming ARO adaptive weld controllers - specialist course (c)
- ZO5: Basics of resistance microwelding theory (c)

**PLASTICS**
- TS1: Plastics and their properties
- TS2: Designing components made of plastics
- TS3: Processing of plastics - injection moulding (c)
- TS4: Plastics processing - extrusion (c)
- TS5: Designing injection moulds
- TS6: Injection moulding machine operation
- TS7: Blow Moulding (c)
- TS8: Polymer composites - processing
- TS9: Plastics according to client’s individual 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)
■ BM3: Pressure Equipment Directive (PED) requirements - 2014/68/UE

SAFETY SYSTEMS
■ SAF300: Programming and designing with Distributed Safety in Simatic Safety Integrated Controllers
■ SAF1500: Programming and designing in Step 7 Safety Advanced in SIMATIC Safety Integrated S7-1500 controllers

TOTAL PRODUCTION MAINTENANCE
■ TPM1: Maintenance management according to TPM and TOC
■ TPM2: Purchasing procedures in maintenance departments (c)

LEAN MANUFACTURING
■ LEAN1: Lean - basic course
■ LEAN2: 5S workplace organization
■ LEAN3: VSM and process optimization
■ LEAN4: Planning and organization of the production
■ LEAN5: Organization of internal logistics

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
■ 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
■ SE3: Solid Edge specialized training according to client’s individual needs (c)