Festo Didactic Training and Consulting
Courses – Southern and Eastern Africa
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Festo Didactic

Festo Training and Consulting – The Training Needs Analysis
Building a basis for value-adding training

Training Needs Analysis: Festo’s internationally tried and tested consulting service for analysing and planning strategic workforce development.

What is the TNA?
The TNA is the basis for a demand-oriented and systematic personnel development. The holistic approach of Festo Didactic Training and Consulting includes executives and identifies the levels of work assignments and processes, as well as the corporate strategy.

What is the outcome of the TNA?
Detailed information on the current technical expertise and knowledge levels of personnel measured against their workplace requirements and international standards. From these findings an overview of current and future skills gaps and their possible impact on the company performance can be derived.

The Training Needs Analysis Principle

Workplace Requirements
The technical knowledge necessary for the workplace is evaluated by means of interviews, observations and tests. Possible knowledge gaps are identified. The basis is provided by assessments of the employee, supplemented by knowledge tests and/or practical exercises. If required, knowledge of specific workplaces and processes in the production environment is also evaluated.

Production Processes
An inspection of the production is undertaken to gather information about the processes and technologies in use. Planned organisational changes and introduction of new technologies are captured. This is vital to identify possible future qualification gaps.

Business Strategy
A discussion with the responsible managers is arranged to establish the training needs from a business perspective. Strategic questions are for example: Which targets are being aimed for? Which key performance indicators are measured? Are there defined standards to be achieved?
Festo Training Anywhere

The Festo Eduvan – Bringing Training to the most Remote Areas of the Country.

Eduvan History:
During 2016 the Festo Didactic Eduvan concept was successfully proven with on-site customer training and a training road-trip covering three provinces. Customers experienced training in the first fully furnished technical mobile training lab. Since then the Eduvan has been traveling around the country training our customers in comfort and convenience.

What it Offers:
The Eduvan can accommodate twelve participants at a time on any of our offered training courses. The courses are presented at the same standard as our training courses in any of the facilities in the major regions of the country. All equipment used for practical exercises is similar to the equipment in our fixed venues and comprises of real industrial components.

On-site Training:
Skills learnt are much more than just listening, reading and writing; it is about doing. The on-site training approach allows for training excursions to take place during the course into the real work environment where hands on trouble shooting and analyses can add real value and return on investment to you.

Benefits to you:
Reduced travel costs and admin work.
Reduced time away from operation.
Availability on site of critical personnel.
Availability of training in remote areas.
Same standard as any of our courses.
The professional world uses the term ‘Industry 4.0’, or Internet of Things (IoT) to discuss the fundamental change that is currently under way in the world of production. The real and virtual world are growing closer together; modern information and communication technologies are merging with classic industrial processes and are thus changing the different areas of production.

Festo Didactic is ahead of the curve with its program for the smart factories of the future; ‘Qualification 4.0’. Recognising the need to redefine the role of humans in the production of the future, the strategy of Festo is based on three pillars: technology, people and qualification. For a short video introduction please click this link.

Festo has already invested heavily in equipment and resources to roll out this program, with pilot courses commencing in 2018. Scan QR code to learn more about I4.0.
Training Courses

Introduction to Industrial Pneumatics

PN100

This course covers the basics of pneumatic industrial automation which adds value to first time users of pneumatic technology. It will improve early diagnosis of faults and the effective communication of problems to maintenance staff when problems occur.

Target Group

- Machine Operators.
- First time technology users.
- Maintenance and non-maintenance personnel.
- All staff members exposed to pneumatics in an industrial environment.
- Purchasing department personnel involved in pneumatic purchases

Contents

- Basic principles of compressed air supply, production, preparation and distribution.
- Power section devices (Linear actuators).
- Sensors on cylinders and machines and what they do.
- Structure and function of pneumatic devices and valves.
- Discussion and practical examples of:
  - Filter and air service units
  - Different Cylinders
  - Different types of Valves
- Different uses and types of Tubing
- The danger and cost of leaking compressed air
- The effects of changing machine settings (pressures, sensor positions etc).
- Daily preventive maintenance.
- Basics of what a PLC does and how machines are controlled.
- Safety considerations when working with machines with pneumatics.

Outcomes

The Participant:

- will understand the basics of pneumatics as a low-cost energy system
- will understand how cylinders are controlled by valves
- realises the importance of air preparation and proper reticulation
- understands why sensors are used
- knows how to identify problems with piping/valves/cylinders/air service units and sensors
- realises the importance of saving compressed air and finding/fixing or reporting leaks
- understands the components of a machine and how they fit into the typical factory maintenance responsibilities
- is conscious of machine safety and realises the importance of safety mechanisms.

Requirements

Technical understanding

Duration

2 days

Please scan the QR code or click here for course pricing and dates.
Pneumatics – Basic

PN101
The course deals in detail with the most up-to-date products, current tools and methods in industry. Our principle is learning from the real world!

Target Group
Everyone who deals with pneumatic systems in their working environment

Contents
- Objectives of low cost automation
- Basic principles of compressed air supply, production, preparation and distribution
- Power section devices (Linear and rotary actuators)
- Use of directional control valve, flow control, pressure and time control valves and sensors
- Structure and function of pneumatic devices and valves
- Basic logic functions and their application
- Symbolic representation of devices and standards (ISO 1219)
- Systematic design of circuit diagrams
- Reading pneumatic circuit diagrams
- Operating modes in pneumatic control systems
- Safety regulations and valid industrial standards
- Typical industrial circuits
- Identifying and eliminating faults
- Practical exercises for all circuits “hands on”

Outcomes
The Participant:
- can design, assemble and test basic pneumatic circuits
- can identify and describe the design, features and operation of pneumatic components
- can identify and explain symbols for pneumatic components
- can read and interpret pneumatic circuit diagrams
- can interpret technical specifications and data relating to pneumatic components
- knows the fundamentals of compressed air generation and preparation

Requirements
Technical understanding

Duration
3 days

Part no
559395

Accreditation
NQF – Level 3

Please scan the QR code or click here for course pricing and dates.
Modern Industrial Pneumatics

PN11

The resources of the training course have been designed to fulfil the expectations of people who have the need to understand and apply the requirements of modern industrial pneumatics with real shopfloor applications. The training course sets a good background for further automation trainings.

This course combines the fundamentals of the Basic Pneumatic and Electro Pneumatic Courses in a neat, application-orientated package.

Target Group

Everyone who deals with pneumatic systems in his/her working environment

Contents

- Combination of electrical control section and pneumatic power section
- Basic principles of compressed air supply: Production, preparation, distribution
- Use of directional control valve, flow control valve and sensors
- Structure and function of electrical switching devices and electro-pneumatic valves
- Basic logic functions and timing functions
- Valve technology
- Symbolic representation of devices and standards
- Identifying and eliminating faults

Outcomes

The Participant:
- can design, assemble and test basic pneumatic circuits
- can identify and describe the design, features and operation of pneumatic components
- can identify and explain symbols for pneumatic components
- can read and interpret pneumatic circuit diagrams
- can interpret technical specifications and data relating to pneumatic components
- knows the fundamentals of compressed air generation and preparation
- can describe the functional relationship between pneumatic and electrical components
- can identify and describe the design, features and operation of electro–pneumatic and electrical components
- can identify and explain symbols for electro–pneumatic and electrical components
- can design, assemble and test an electro–pneumatic circuit
- can read and interpret electro–pneumatic circuit diagrams
- knows the role of a PLC in automation

Requirements

Technical understanding

Duration

4 days
Pneumatics – Maintenance

PN121

Extend your specialist knowledge of pneumatic control systems and improve your methodical skills. Practical exercises on training equipment for setting up, commissioning, troubleshooting and fault elimination make it easier to transfer knowledge to your day-to-day work.

Target Group

Design Engineers, Plant Engineers, Maintenance staff and instructors

Contents

- Pneumatic Symbols and Standards (Revision)
- Pneumatic power generation, preparation and distribution
- Design, function and identification of pneumatic components
- Reconstruction and reading of pneumatic circuits
- Reviewing, completing and using machine documentation
- Developing and applying troubleshooting strategies
- Optimizing systems using fault documentation
- Learning and applying safety regulations and valid standards
- Practical exercise and systematic “hands-on” troubleshooting

Outcomes

The Participant:
- knows and can identify the problems associated with poor compressed air preparation
- can set up and commission pneumatic systems
- can maintain and systematically troubleshoot pneumatic control systems
- can understand the causes of downtime and failures
- can interpret latest standards and regulations

Requirements

Pneumatic Basic course (PN101)
OR
Modern Industrial Pneumatics (PN111)

Duration

3 days

Part no

559390
Pneumatics - Advanced

PN122

Extend your technical and methodological knowledge. This course addresses specific issues relating to maintenance and the ability to understand the functional relationships of complex machinery.

Target Group

Design Engineers, Plant Engineers, Maintenance staff and instructors

Contents

• Basic Principles of compressed air technology, production, preparation and distribution (Review)
• Power section devices and actuators, (specific application) Bellows, Rodless, Rotary & Impact cylinders, Pulse Ejectors, Grippers
• Valves and basic logic functions (specific application) Counters, Timers, Two Hand and Binary control
• Positioning, open and closed loop
• Sequence, and sequence stepper control
• Vacuum technology
• Low pressure pneumatics (air sensors and amplifiers)
• Emergency Controls (soft start)
• Hydraulic feed units
• Rotary Index tables, and strip feed units
• Practical exercise and typical industrial circuits

Outcomes

The Participant:
• can design, assemble and test complex pneumatic systems
• can identify and describe the design, features and operation of specific application power section devices and valves
• can describe the fundamentals of vacuum generation and applications
• can describe the function and applications of low pressure pneumatics
• has an understanding of the function of emergency – controls in pneumatic systems

Requirements

Pneumatic Basic course

Duration

3 days

Part no

575223

Please scan the QR code or click here for course pricing and dates.
Electro - Pneumatics

PN211

After the course, you will be able to successfully design electro-pneumatic systems in your company. You will be familiarized with different technologies, identify differences and similarities and be given an opportunity for in-depth discussion.

Target group

Design Engineers, Plant Engineers, Maintenance staff and instructors

Contents

- Electrical principles
- Electrical and pneumatic symbols and standards
- Interaction of electrical control section and pneumatic power section
- Function of signal generators (push buttons, switches and relays)
- Components of power section control section
- Electronic sensors (inductive, capacitive and infrared)
- Systematic production and reading of electrical circuit diagrams
- Operating modes of electro-pneumatic control systems
- Coordinated sequence controls
- Fault finding procedures and systematic troubleshooting
- Safety regulations and valid standards for electrical engineering and pneumatics
- Practical exercises for all circuits “hands-on”
- Typical Industrial circuits

Outcomes

The Participant:
- can describe the functional relationship between pneumatic and electrical components
- can identify and describe the design, features and operation of electro–pneumatic and electrical components
- can identify and explain symbols for electro–pneumatic and electrical components
- can design, assemble and test an electro–pneumatic circuit
- can read and interpret electro–pneumatic circuit diagrams
- knows the role of a PLC in automation

Requirements

- Basic knowledge of control technology
- Pneumatic Basic Course PN101

Duration

Part no

3 days
566228

Please scan the QR code or click here for course pricing and dates.
Valve Terminals 1

VT101

Valve terminals are banks of pneumatic valves placed conveniently in one place. They can dramatically reduce piping and wiring on machines and help to keep the pneumatics of complex systems simple and accessible. Valve terminals can be controlled by means of discrete IO from PLC’s or through higher level communication protocols. Considering the high density of technology packed into these devises, they can appear complex - this course serves to break down their function and control and give candidates the insight required to confidently understand, work on, fault find and modify these devices.

Target Group

Anyone exposed to pneumatic valve terminals.

Contents

- Valve terminal anatomy
- Valves in valve terminals
- Special functions of air channels
- Control methodology
  - Discrete IO
  - Fieldbus
    - Practical Excercises
      - Profibus Connection and Configuration to PLC’s
      - CanOpen Connection and Configuration to PLC’s
    - Theoretical Component and Fieldbus discussion
      - Profinet
      - EthernetIP
- Trouble shooting of valve terminals
- Tools for analysis of devices

Outcomes

The Participant:

- Can dismantle and repair a Valve terminal
- Can fault find a valve terminal
- Can dismantle a VT
- Connect a valve terminal to a PLC using Profibus
- Can use the Festo Maintenance Tool to fault find online

Requirements

Basic Pneumatics (PN101) and Electro Pneumatics (PN211)
OR
Modern Industrial Pneumatics (PN111)

Duration

2 days

Please scan the QR code
or click here for course
pricing and dates.
Energy saving in pneumatic systems

PN361

Save Energy – Save Costs. Energy saving is becoming vitally important for the sustainability of a business, with the high cost of energy. In large factories or small workshops, the intelligent use of every energy source and the right sizing and selection of components save significant amounts of cost, time, waste etc. Compressed air is a very important energy source for industrial production. The possibilities to save costs from compression to consumption of air are enormous. But everything begins with the skill of the people who work with it. This course focuses attention on cost-saving and improving the areas of compressed air production, distribution, preparation and optimization of pneumatic circuits. This course particularly matches the training needs of those customers in conjunction with a Festo Energy Saving Service.

Target group
Operators, Maintenance, Engineering, Designer, Trainer

Contents

- The cost of compressed air with measurements
- The cost of leaks
- The compressed air consumption of various circuits
- The cost of over and under sizing of components
- The right sizing for efficiency
- Energy efficient circuits
- Correcting the failures that caused efficiency wastes

Outcomes

The Participant:
- understand and evaluate the relation between the consumption and the cost of energy sources
- apply efficiency measures in the preparation and distribution of compressed air
- correct the failures that caused efficiency wastes
- apply efficiency measures in pneumatic circuits
- select efficient components for various applications
- measure the air consumption of various pneumatic applications
- improve the lifetime of various pneumatic components

Requirements

Pneumatic Basic course (PN101)
OR
Modern Industrial Pneumatics (PN111)

Duration
2 days

Part no
1227237

Please scan the QR code or click here for course pricing and dates.
Hydraulics Basic

HY511

This course provides you with an insight into hydraulic hardware technology and its function. You will learn to produce and read circuit diagrams and set the speed, pressure and position for hydraulic drives. As with all our courses, practical work is an important component.

Target group

Everyone who deals with hydraulic systems in their working environment

Contents

- Standards for equipment and circuit diagram representation
- Design and function of hydraulic power supply systems
- Physical principles
- Measurement of volumetric flow rate, pressure and temperature as an aid to troubleshooting
- Hardware technology and characteristic data for valves and actuators
- Reading and interpreting basic hydraulic circuit diagrams for direction, speed, pressure and position
- Basic principles of systematic troubleshooting

Outcomes

The Participant:
- is able to name the basic components and their symbols
- can explain the physical principles of hydraulics and use them for troubleshooting
- knows how the volumetric flow, pressure and temperature is measured in a hydraulic system and what the values mean for evaluation of the system
- can design, assemble and test basic hydraulic circuits
- can understand, read, and interpret circuit diagrams
- can interpret the characteristics data of valves and drive elements

Requirements

Technical understanding

Duration
3 days

Part no
559448

Accreditation
NQF - Level 3

Please scan the QR code or click here for course pricing and dates.
Hydraulics Advanced

HY512

The in-depth hydraulics training combines hydraulics and electro-hydraulics in order for maintenance staff to extend their technical and methodical knowledge. This enables specific issues relating to maintenance to be dealt with in more detail.

Target group

Design Engineers, Plant Engineers, Maintenance staff and instructors

Contents

- Standards and safety regulations
- Design and function of hydraulic power supply systems
- Design and function of hydraulic valves for controlling direction, speed, position and force
- Hydraulic drives for linear and rotary movements
- Electric signal control for hydraulic power section with switching solenoid and proportional solenoid interfaces
- Synchronized controls, valve fittings, hydraulic reservoir circuits
- Systematic troubleshooting, damage analysis and weakness elimination
- Intensive practical training involving design of control systems based on circuit diagrams, commissioning and testing

Outcomes

The Participant:
- can identify and describe the design, features and operation of electro-hydraulic and electrical components
- can identify and explain symbols for hydraulic, electro-hydraulic and electrical components
- knows the features of special application and piloted valves, special cylinders and hydraulic motors
- can design, assemble and test electro-hydraulic circuits
- can read and interpret hydraulic and electro-hydraulic circuit diagrams
- can apply the principles of systematic troubleshooting to real applications

Requirements

Hydraulics (1) Basic or equivalent course

Duration

3 days

Part no

561317
HY132

You will become familiar with the function and actuation of proportional (dynamic) valves and the design of basic circuits in relevant industrial applications. The extensive practical part provides you with an opportunity to design circuits, adjust parameters and gain experience of commissioning and troubleshooting in proportional hydraulic control systems.

Target group

The course is aimed at anyone who is faced with proportional hydraulics in their practical work. The high level of practical relevance makes the course particularly suitable as a supplementary course for instructors.

Contents

- Basic principles of proportional hydraulics
- Design, function and characteristics data for proportional, directional control, pressure and flow control valves
- Generation of target values (analogue and digital)
- Adaptation of amplifier electronics to required conditions
- Development and interpretation of proportional hydraulic circuit diagrams
- Intensive practical training involving design based on circuit diagram and adjusting parameters for optimum commissioning
- Instructions for maintenance, troubleshooting and commissioning
- Introduction to servo valve technology and control
- Proportional valves in open control loop systems, control valves in closed control loops
- Current standards and safety regulations for practical operation and exercises

Outcomes

The Participant:
- understands the principles of proportional hydraulics
- can explain the structure and mode of operation of proportional way, pressure and flow control valves
- can interpret the characteristics data of proportional valves
- can adapt amplifier electronics to the required conditions
- can develop and read proportional hydraulic circuit diagrams
- can explain the principles of servo valve technology and controls
- can explain the difference between open and closed loop controls
- can name current standards and safety regulations for industrial practice

Requirements

Hydraulics (1) Basic
Hydraulics (2) Advanced

Duration
3 days

Part no
12221201

Please scan the QR code or click here for course pricing and dates.
A large percentage of spare parts sold for hydraulic plants and machinery are used to replace defective components. Most of these defects can be traced to improper operation or maintenance. These mistakes and bad practices could cost hydraulic users hundreds of thousands of rands every year. This course will teach your maintenance staff how to avoid this situation and how to reduce the operating cost and increase the uptime of hydraulic equipment.

Contents

- Hydraulic equipment maintenance - why it’s so important
- Maintaining fluid cleanliness
- Maintaining fluid temperature and viscosity within optimum limits
- Maintaining hydraulic system settings to manufacturers’ specifications
- Scheduling component change-outs before they fail
- Following the correct commissioning procedures
- Conducting failure analysis
- The true cost of hydraulic fluid leaks
- Fluid contamination and dealing with water in hydraulic fluid
- Troubleshooting basics and how to avoid costly mistakes
- Symptoms of common hydraulic problems and their causes
- Locating internal leakage
- Fundamentals of hydraulic component and cylinder repair

Outcomes

The Participant:
- can describe how fluid contamination destroys hydraulic components
- can determine an appropriate fluid cleanliness for different types of hydraulic systems
- can achieve and maintain an appropriate fluid cleanliness on a continuous basis
- can identify and rectify abnormal contamination load
- can name the one proactive maintenance routine that will save large sums of money
- will know how to prevent damage to hydraulic systems caused by low fluid viscosity
- can define operating temperature limits based on fluid viscosity values that will maximize component life
- can identify and rectify abnormal heat load
- can identify faulty circuit protection devices before they cause component failure
- can and will know when to schedule hydraulic component change-outs to minimize operating costs
- will know what to do when installing hydraulic components to avoid reduced service life
- can identify and name the causes of common hydraulic problems and how to locate them
- can apply special techniques for troubleshooting simple hydraulic systems
- can recognize and avoid costly troubleshooting mistakes and get the correct diagnosis
- can carry out effective repairs on hydraulic cylinders and components

Requirements

Hydraulics (1) Basic

Duration
3 days

Part no
561317

Please scan the QR code or click here for course pricing and dates.
Mobile Hydraulics

HY152

The know-how needed to design, maintain and operate the mobile hydraulic systems is becoming more important each day. Due to the complexity of the systems compared to industrial hydraulics, the skills needed to maintain and design, require strong mobile hydraulics fundamentals. In this course, you will learn every important detail related to mobile systems, and due to many interesting mobile solutions and circuits, this course also enlarges your perspective of industrial hydraulics.

Target group

Maintenance, Engineering, Trainer

Contents

- Hydro-static transmission and related components
- Steering unit
- Working hydraulics
- Load holding
- Load sensing in constant and variable displacement pumps
- Pressure and flow control
- Fundamentals of proportional control
- Commissioning and maintaining mobile systems

Outcomes

The Participant:
- identify the components and explain their functions in a given mobile hydraulic circuit
- build and test hydrostatic transmission, working hydraulics and steering circuits
- explain load sensing functions and other efficiency components
- make adjustments for the required control parameters of mobile hydraulics
- measure the required parameters in a mobile hydraulic circuit
- systematically troubleshoot and explain maintenance procedures
- explain the safety measures in mobile equipment

Requirements

Hydraulics (1) Basic

Duration

4 days

Part no

573359
Not every industrial application demands a complex PLC. A few inputs and outputs are often sufficient to automate a simple application quickly and reliably. A small and simple PLC that has an equally uncomplicated programming language can quickly be learned. After the event, participants can create accurate and clear programs.

Target group
Design Engineers, Plant Engineers, Programmers, Maintenance staff and instructors

Contents
- Basic design and control of a basic programmable logic controller
- Input and output properties
- Hardware and software familiarization
- Programming languages: statement list, ladder and function block
- Basic command sets
- Creating, loading and testing industry related sequence programs
- Creating time delay and counter functions
- Program editing
- Fault analysis

Outcomes
The Participant:
- can read out and create hardware configurations
- can create logic associations and sequences as PLC programs and commission these
- can implement modes such as Automatic, Manual, and Emergency Stop
- can combine various program modules to structured programs
- can identify and eliminate faults using the status display
- can identify reasons for machine stoppages with the aid of the PLC program

Requirements
Pneumatics (1) Basic
Electro-Pneumatics & experience in operating a PC with a Windows interface

Duration
3 days
Part no
561204
Accreditation
NQF - Level 3

Please scan the QR code or click here for course pricing and dates.
PLC281

Each participant receives a Festo CECC CoDeSys PLC and Software (T&C’s apply)

In order to master the fast-changing requirements of embedded and PC-controlled industrial applications, it is increasingly important to master and apply different programming languages. This is complicated by the huge variety of programming software available. Differences in user-interface, functionality and command sets cause confusion and mistakes are more likely. CoDeSys, a tried and tested, globally introduced hardware independent software from 3S, offers a Controller Development System according to the IEC 61131-3 standard with all defined programming languages independent of the hardware manufacturer. This training demystifies CoDeSys and gives participants’ confidence in using it.

Target group

Design Engineers, Plant Engineers, Programmers, Maintenance Staff and Instructors

Contents

- Basic design and control of CoDeSys
- Hardware Configuration
- Wiring inputs and outputs
- Local and Global addressing of variables
- Programming languages for CoDeSys: LD, FBD, ST, IL, SFC, CFC
- Timers and Counters functions
- Formulate, download and testing of industry related sequence programs

Outcomes

The Participant:
- can configure and commission a CoDeSys controller
- can create hardware configurations
- can create and commission PLC programs with logic associations and sequences
- can understand and create program structures
- can combine various program modules into structured programs

Requirements

Pneumatics (1) Basic
Electro-Pneumatics & experience in operating a PC with a Windows interface
Introduction to PLC

Duration

3 days

Part no

570612

Please scan the QR code or click here for course pricing and dates.
PLC282

This course will enable service and commissioning personnel to work with analogue signals and effectively optimize a plant loop. In this course you will master the principles of automatic process control using the CoDeSys Festo PLC, CECC–LK, and the operation of the feedback loop to include proportional, integral and derivative control modes. Advanced concepts of cascade and ratio feed forward control will also be covered. You will also learn and practice controller tuning methods and get an overview of drawings used in industry.

Target group

Maintenance, Engineering, Trainer, Instrumentation

Contents

- Fundamentals of analogue value processing
- Fundamental concepts of closed-loop control
- Optimizing criteria
- Controller selection
- PID algorithm for digital control
- Multi-loop control
- Hands-on exercises
- Flow, level, temperature, pressure loops

Outcomes

The Participant:
- can perform analogue PLC programming
- can commission a basic open loop, and closed-loop system
- can read and design technical drawings for process technology
- can operate, identify and analyse a control system
- can identify the fundamentals of closed loop control technology
- can operate a control system with a PID controller
- can choose the correct loop tuning method

Requirements

Successful completion of CoDeSys Course V3.5

Duration

4 days

Part no

12221243

Please scan the QR code or click here for course pricing and dates.
ED811

The increasing use of electrical positioning drives in industry has led to a skills gap that can have a negative impact on productivity. If you are a user of conventional pneumatic drive technology, this course provides you with the knowledge and skills to master the basics of electrical positioning drives.

Target group

Maintenance, Design/Engineering, Trainer

Contents

- Fundamentals of electrical drives
- Linear & Rotary Mechanical Drives (Tooth belt, Spindle, Ball screw, Torque motor)
- Motors (DC Motors, AC Motors - Synchronous & Asynchronous, Servo, Stepper)
- Direct Drives (Linear & torque motors)
- Brakes for electrical drives
- Mechanical gear units for electrical drives
- Displacement encoders (Incremental, absolute, resolvers)
- Selection Criteria for electrical drives
- Controllers
- “Positioning Drives” (Software tool)

Outcomes

The Participant:
- can differentiate between the different types of mechanical drives (axis), and their constructions
- understands and knows the characteristics and technical data and applications of the different types of mechanical drives (axis)
- can differentiate between the different types of electrical motors and their constructions
- understands and knows the operation, characteristics and technical specifications and applications of the various types of electrical motors.
- can differentiate between the different types of brakes and gear units for electrical drives, their operation and application.
- can differentiate between the different types of encoders, their operation and application
- can select the most appropriate electrical drive (axis, motor, brake, gear unit and controller) for a given application using the “Positioning Drives” software tool.
- can set up, commission, power up and configure an electrical drive system,
- can use the configuration software to set up the different parameters for speed, homing,
- positioning and torque control
- can work safely with an electrical drive

Requirements

Basic knowledge of electricity
Experience in operating a PC with a windows interface

Duration

3 days

Part no

562553

Please scan the QR code or click here for course pricing and dates.
Planning, assembly, programming, commissioning operation, maintenance and troubleshooting of production systems are taught at various levels of complexity:
- With innovative technology
- With systematic use of industrial components
- In close cooperation with market leaders in automation

Target group
Design Engineers, Plant Engineers, Programmers, Maintenance staff and instructors

Contents
- Basic design of a mechatronic control system, incl. pneumatics, mechanics, electrics
- Input and output module tasks
- The three programming languages: FCH, LDR and STL
- Basic command set for PLC
- Creating, loading and testing simple programs
- Using the status display, fault-finding
- Signal storage
- PLC timer
- Archiving and de-archiving PLC programs

Outcomes
The Participant:
- can identify and describe the operation of pneumatic, electro- pneumatic, electrical and PLC components and sensors
- can assemble, and test basic mechatronic circuits (pneumatics, electrical, and software)
- recognizes and can differentiate between the different types of programming languages used in industry
- can download a program and commission a PLC control system
- can troubleshoot basic mechatronic systems

Requirements
We recommend a basic knowledge of PLC and pneumatic control technology. Participants should also be familiar with operating a PC with a Windows interface

Duration
4 days
Part no
565671

Please scan the QR code or click here for course pricing and dates.
ROB11

For many years robotics has been evolving fast, providing speed, precision and quality in production processes. This course provides you with an insight into robotic hardware technology, its function and operation.

Target group

Maintenance staff, designers, engineers, trainers

Contents

- Robot arm design
- Robot controller
- Joint movements
- Coordinate systems
- Speed commands
- Movement commands
- Creating Position Lists
- Formulate, download and testing of related sequence programs
- Multi-tasking
- Uploading data from robot controller
- Safety regarding robots

Outcomes

The Participant:
- can describe the mechanics behind robotics systems
- can describe the working principles behind the control of movement and speed
- can explain what a coordinate system is
- can read and write a basic robotics sequence program
- can identify and eliminate faults using the status display

Requirements

Electro Pneumatics & Experience in operating a PC with a windows interface

Duration

3 days

Part no

578435

Please scan the QR code or click here for course pricing and dates.
PA311

Our water and wastewater sectors suffer from a lack of capacity and performance which impacts negatively on the environment, public health and economic processes. Polluted domestic and industrial wastewater together with fertilizers used in agriculture lead to pollution of lakes and can cause severe damage to entire eco-regions and river basins. Despite large-scale investments in water infrastructure, we still face challenges in terms of operation and maintenance of water and wastewater treatment plants. The drinking water therefore often fails to comply with quality regulations.

Target group

Technical staff and supervisors of wastewater treatment plants

Contents

Water purification and waste water treatment:
- Flocculation
- Sedimentation
- Chlorine dosing and disinfection
- Filtration Water supply
- Operation of pumps
- Water transport to high tower
- Water supply to different pressure zones Water loss
- Waste water transport
- Hydraulic of water flow in pipes
- Transport of solids
- Operation of sewer systems

Outcomes

The participant is able to:
- influence coagulation, flocculation and sedimentation processes
- measure and interpret chlorine dosage
- understand activated sludge processes in wastewater treatment
- supervise and control a common pump station system
- implement measures to ensure water supply to different pressure zones
- understand the function of valve control systems
- reduce water losses through pressure control
- regulate and circulate water flow
- understand the transport of solids
- handle the operation of sewer systems

Requirements

Technical knowledge

Duration

3 days

Part no

12272436

Please scan the QR code or click here for course pricing and dates.
Industry 4.0 has become a keyword for industrial production. But most of the shop floor workers have only vague ideas of what Industry 4.0 means and what impact it will have on their working environments. That’s why many of them are concerned or even demotivated. However, to successfully master the implementation of Industry 4.0 in companies, a qualified and motivated workforce is essential. This training program provides comprehensive information on Industry 4.0 and creates understanding and acceptance for its implementation. As a result, companies will have it easier to introduce Industry 4.0 and to maintain the motivation of the workforce.

Target group
Any interested persons

Contents
- Basic information about Industry 4.0: “What does Industry 4.0 mean?”
- Reflection and discussion: “Which impact does digitalization have on me and my company?”
- Blended learning: “Which best practice examples can help me in my daily business?”
- Stimulation of self-directed learning: “How can I participate and design the changes with my knowledge and experience?”

Outcomes
After completing this training course, the participants:
- understand what Industry 4.0 means and are familiar with its characteristics and benefits
- know the most important terms of Industry 4.0
- have an impression of the effects of digitalization on working life
- know how digitalization looks like in their private and professional life

Requirements
An interest in the future of automation

Duration
1 days
Part no
594782
Introduction to Industry 4.0 for Management:
Core elements and business opportunities for management

TCM261

Industry 4.0 is an increasingly trending topic with many different ideas of what it means. People working in leadership positions encounter Industry 4.0 more and more and must be knowledgeable about its impacts. Industry 4.0 offers numerous opportunities for companies to improve their productivity, quality and processes. However, as a first step, managers need to have a basic understanding of the core elements and technologies and how their interaction leads to Industry 4.0. Subsequently, they can develop new business models and specific strategies to implement Industry 4.0 solutions in their companies. This training targets management level and gives a general introduction into topics related to Industry 4.0. As a result, participants understand the core principles and can apply them implementing respective business strategies.

Target group

Upper management, decision-makers and executives from strategy and innovation departments.

Contents

• Introduction to Industry 4.0
• Difference between Industry 3.0 and 4.0
• Overview of the core elements and technologies of Industry 4.0, e.g.:
  – RFID
  – HMI
  – M2M communication
  – Vertical and horizontal integration
  – Decentralized self-controlling production
  – Augmented reality
  – ... and more.
• Social-technological developments and their consequences
• Industry 4.0 business models and creating new business ideas
• Two-day-training covers the following additional topics:
  – Bottom-up and top-down strategies to implement Industry 4.0
  – Industry 4.0 competency development
  – Industry 4.0 change management

Outcomes

After completing this training course, the participants:
• are familiar with the core elements and basic technologies of Industry 4.0
• understand how the core elements and technologies are connected and can lead to a holistic approach to improve processes and products
• recognise the opportunities for developing new business models and what to take into account when implementing new strategies towards Industry 4.0

Requirements

An interest in the future of automation

Duration

1 days

Part no

594785

Please scan the QR code or click here for course pricing and dates.
Industry 4.0: Applications in Practice

AUT521

Industry 4.0 allows smart-factory workers to use a series of applications that could previously not be implemented or that could only be implemented through tedious manual labour. These applications can be used for plant operation, maintenance, planning and control, as well as for tracking orders and inspecting plant operation.

During this training course, the participants will learn about ways to use these kinds of applications within a complete production process, using the Festo Didactic CP Lab or the CP Factory as an example. Simultaneously, the participants will establish ways to integrate typical Industry 4.0 applications into vocational training courses.

Target group

This training course is recommended for teachers and trainers who want to work more closely with the technical contents of the CP Lab or CP Factory.

Contents

- The concept of adaptable production: operation, visualization, parameterization and routing orders to the CP Factory
- Handling data: saving data, cloud computing, data security, data mining
- Lean production: implementing value streams using the CP Factory, line balance, working with ‘breathing’ buffers, batch size 1 production
- Smart maintenance: OEE as the most important metric for analysing plant productivity, the concept of a usage-dependent maintenance strategy, condition monitoring, remote diagnostics
- Energy efficiency: usage monitoring, recording consumption, localizing and identifying energy losses, using increased energy consumption data to draw conclusions about component wear and behaviour in the event of failure
- Didactically implementing the topic into your vocational training courses
- Planning learning units using the CP Factory
- Practical exercises

Outcomes

After completing this training course, the participants:
- are familiar with typical application scenarios for intelligent Industry 4.0 systems
- understand how these application scenarios play out in the CP Factory and put them to practical use
- know the professions and vocational training topics for which these applications are relevant, prepare initial areas of application for their courses and plan a sample learning unit

Requirements

An interest in the future of automation

Duration

5 days

Part no

593516

Please scan the QR code or click here for course pricing and dates.
Introduction to Lean Production and Value Stream Mapping

LP121

Taking the form of a strategy game, this training gives you a holistic view of material and information flows within a company and sensitizes you to different types of waste in processes. You learn to analyse the causes of delivery problems and low productivity and to develop and implement ideas for meeting customer needs and improving processes. The main goal is to instil lean thinking in your company. The strategy game provides practical experience for all employees involved in lean production projects.

Target group

Maintenance, Design / Engineering, Trainer

This course ideally is presented to participants from the same company. The course can be presented in-house or at our premises. A minimum of 12 participants is required to simulate a complete business.

Contents

- Inventory minimization as an important basis for increased productivity
- The principle of pull production control
- Advantages compared to conventional production control methods
- Types and function of different pull production control methods
- Application of methods
- Kanban – the classic pull principle
- SMED – Optimization of setup processes with Single Minute Exchange of Die
- CIP processes as part of the business game
- Introduction to Value Stream Mapping (VSM)

Outcomes

The Participant:
- can analyse the causes of delivery problems and low productivity
- can develop and implement ideas for meeting customer requirements and process improvements

Requirements

Some experience in production control

Duration 2 days
Part no 561209
This course provides service technicians with an overview of commonly used maintenance strategies, compares these based on different requirements and thus provides you with a basis for making maintenance decisions to maximize availability in your own company.

**Target group**
Maintenance, Design / Engineering, Trainer, Management

**Contents**
- Production systems and their influence on maintenance
- Six typical types of machine and system losses
- Roles and self-image in maintenance
- Organisational structures for maintenance
- Comparison of maintenance strategies:
  - Event oriented maintenance
  - Routine maintenance
  - Total Productive Maintenance (TPM)
  - Reliability-Centred Maintenance (RCM)
  - Risk-Based Maintenance (RBM)
- Data for recording maintenance performance
- Examples and practical exercises

**Outcomes**
The Participant:
- can establish sources of loss on machines and systems
- sees maintenance as a service provider for production
- can evaluate various maintenance strategies and select the appropriate one for the company or various machines
- can implement the company’s maintenance strategies
- can select and collect data for recording maintenance performance

**Requirements**
Experience in maintenance

**Duration**
2 days

**Part no**
559428
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Course bookings:
Email bookings and queries to: didactic.za@festo.com

Consultation and registration
Make sure of your place on a course by registering as early as possible. The number of places are limited and registrations are dealt with on a “first-come, first-served” basis. However, if a course is oversubscribed, we will make every effort to offer you a suitable alternative date. Our lines are open for telephone enquiries from Monday to Thursday, 08:00 to 17:00, Friday 8:00 to 15:30.

Order confirmation
We will send a written confirmation of your course booking for your records.

Course changes
From time to time courses are subject to change. Pre-booked participants will be informed telephonically.

Withdrawal
If there are any changes in your company, you can always specify an alternative participant. However, we ask you to notify us of any cancellations at least 5 days before the beginning of the course.
Cancellation with full refund only granted if written notification is given 5 working days before commencement of course. Fees are not refundable for non-attendance or non-timeous cancellation.
However, 50% of the course fee will be credited against attendance within 3 months for the same course.
This 50% credit will be forfeited for any further cancellations of the same course.

Fees
The course prices are exclusive of VAT at the statutory rate and, unless otherwise specified, include the course fees, course documents, meals and drinks during the event.

Liability
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Certification
On successful completion of the course (theory and practical), candidates receive a Festo certificate of competence.
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• Johannesburg
• Cape Town
• Durban
• Port Elizabeth
• East London

Options for In-House Courses – We come to you:
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• Courses are conducted in our Mobile Classroom or Eduvan.

Course times:
• 08H00 – 16H00

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Email: DidacticTaC.za@festo.com

Consulting:
• Our customer advisors will be pleased to assist you with any questions on content, location, dates and special courses
• Simply call Festo Didactic on 011 971 5626 / 5500
Festo – The Engineers of Productivity.

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- We shape the future together.
- We are the partner to inspire you.

Festo Training and Consulting

One mission of Festo Didactic is to provide technology training for industrial customers worldwide – “We foster sustainable growth and keep the world moving”.

Our Automation Skills Consultants provide training programs on- or off-site, and uses the IDEA® philosophy to create bespoke interventions:

- Identify – the need
- Develop – individual customization
- Engage – roll-out the training
- Apply – on-site application and evaluation