Training and Consulting
Range of courses for 2016
South Africa

www.festo-didactic.com
Education is the great engine of personal development.

- Nelson Mandela
Are you satisfied with your current productivity?

This question is central to our thoughts and actions. Festo is a global engineering and manufacturing company that maintains its own global training and consulting teams for customers around the world. Operating in the same economic sector and environment as our customers, we have a level of understanding and insight into your challenges that allows us to meet your needs by providing targeted training and consulting solutions. We are able to deliver our training services around to the highest standard that both you and we require.

Our portfolio combines training courses with tailor-made Knowledge Checks, e-learning, courseware and hands-on learning systems. This unique integration increases the effectiveness of learning, optimises learning outcomes, and maximises learning transfer. We can conduct a comprehensive analysis of your staff’s training needs to effectively align the contents and aims of in-house courses with your business objectives. On completion of the analysis, you are presented with a detailed report on your employees’ current knowledge levels and a competence development plan that addresses your key business objectives.

You can take advantage of our latest offering to fill potential competence gaps: We now provide tailor-made competence programs in the fields of maintenance, mechatronics and supply chain management. They consist of a range of training courses and project work specifically geared to the employees’ role and industry needs – an optimal basis for their everyday work. Employers see immediate improvements in staff performance, confirming the programs as a sound investment with an excellent ROI.

This planner provides details of our competence programs, courses and serious business games. Please do not hesitate to contact us directly to discuss your needs and ideas.

Dr. Daniel Boese  
Managing Director  
Festo Didactic GmbH & Co. KG

Dr. Theodor Niehaus  
Managing Director  
Festo Didactic GmbH Co. KG
Training and Consulting

The industrial evolution is in full swing: processes are becoming more complex, time is becoming more precious and costs and cost structures are becoming more important.
With our training services, we show you in black and white how Festo Didactic is effectively keeping up with this evolution.

As a driver of industrial automation, we are proud to present our contribution on the following pages. It demonstrates that, for decades, we have, together with you, our customer, taken the right direction: that of the greatest productivity.
We have a very big goal: your productivity. Our motivation is to achieve this goal together with you. We take advantage of everything possible to make you more successful: our knowledge, our capabilities, our performance, our products, our services and our training. We achieve this goal with four outstanding qualities for which we stand: **security, efficiency, simplicity and competency.** And this makes us what we are. Experts who don’t give up. Professionals who make the working day easier for you. Trainers and consultants who always manage to get a bit more out of your technologies, your organization and your people.

**Facts and Figures:**

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In a word, this makes us engineers of productivity.
A hands-on approach to learning

As the world’s leading training organisation for automation, there is one thing you can be sure to get from Festo Didactic: Excellence. Your Ideal Partner in Training Courses, Workshops, Industrial consulting

World class training in tune with tomorrow's needs

Consulting, training needs analysis, in-house courses

Without a doubt, no two sectors of industries are alike; a sector has its own requirements - and no one knows and reacts as individually as Festo Didactic. Whether it’s the automotive, electronics or food packaging and processing industry, we work with you to plan courses, customised to your needs and conduct them on your premises. Joint analysis of requirements can be a very useful initial step.

Experienced instructors and consultants provide customised solutions to make your employees and your company successful. Public or in-house, the focus is always on hands-on experience using actual products in learning factories.

Training content: Technology skills.

Training “hands-on” skills using real industrial equipment. Learning by doing, with theory in:

- Pneumatics
- Electro-pneumatics
- Programmable Logic Controllers
- Electrical Drives
- Mechatronics
- Hydraulics
- Electro-Hydraulics
- Proportional Hydraulics
- Mobile Hydraulics
- Instrumentation & Control
- Water Treatment
- Maintenance strategies
- Organisational skills
- Communication skills

Who should attend?

From the Newcomer to Artisan, Learners, Apprentices, Machine Operators, Foreman, Technicians, Draughtsmen and Engineers

Participant Benefits

The training courses will enable the participants to:

- Understand the basic fundamentals of control systems

Company Benefits

The use of new technologies and the training in these technologies is vital to the successful implementation of strategies that give you the competitive edge:

- Fewer machine failures
- Faster fault-finding and better repairs
- Higher system availability and productivity
- Lower running costs
- Higher engagement and recognition
- Better co-operation between departments
- Preparing for new tasks as a result of change processes
Experience training in the first fully furnished technical mobile training room. This provides twelve participants at a time the opportunity to receive training in the most remote regions of the country; presented at the same standard as the head office training rooms.

Skills are much more than just listening, reading and writing; it is about doing. The mobile training facility provides a unique training platform, on site, to learn new skills and integrate it with plant interaction. All equipment used for practical exercises are the same as in our fixed venues.

Time is money. Schedule the training in the mobile training facility to keep operational downtime to an absolute minimum. No need to take the workforce away to a remote training facility; bring the facility to your doorstep. No more travel or accommodation arrangements to worry about!

For more information and prices contact Festo. Tel: 011 971 5626/5586
# Technology & Organisation

## Course Overview

### Technology

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**Organisation & People**

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*Contact Festo Didactic for dates and more information*
Technology

Triple skills

Experience

For over 40 years, we have been providing support for all development stages of automation technology. Our seminars use the latest technology. Close collaboration with our parent company ensures access to the latest machines and systems, while our trainers have first-hand expertise.

Innovation

We place tough demands on our training. At our seminars, you will notice the difference compared to other training providers. We provide new answers to long-standing questions that help you to make decisive steps in your company plans.

Vision

Our trainers are active in their trade, and know the areas of work of your participants. This knowledge extends beyond purely technical requirements to questions concerning topics such as just in time, TPM and Kanban.
Pneumatics (1) - Basic

PN111

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

Target group

Everyone who has to deal 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

Order no

559395

Price

R6 900 (excl. VAT)

Accreditation

NQF - Level 3

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Pneumatics (2) - 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
• Optimising 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 (1) Basic course

Duration

3 days

Order no

559390

Price

R7 100 (excl. VAT)

Accreditation

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Pneumatics (3) - Advanced

PN122

Extend your technical and methodical knowledge. This 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 (1) Basic course

Duration
3 days

Order no
575223

Price
R7 200 (excl. VAT)

Accreditation
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Electro - Pneumatics

PN211  After the course, you will technically and didactically be able to successfully design the electro-pneumatics systems in your company. You will be familiarised 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 (1) Basic Course

Duration  3 days

Order no  566228

Price  R7 100 (excl. VAT)

Accreditation  NQF - Level 4

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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 optimisation 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 Participants can:
- 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
- apply efficiency measures in the consumption 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
Pneumatics (1) Basic Course

Duration
2 days

Order no
1227237

Price
R4 600 (excl. VAT)

Course Title and Venue...

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Hydraulics (1) Basic

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 in all courses, practical work is an important component.

Target group
Everyone who has to deal 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 are 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

Order no
559448

Price
R8 600 (excl. VAT)

Accreditation
NQF - Level 3

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Hydraulics (2) Advanced

HY521

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
- Synchronised 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

Order no
561317

Price
R8 700 (excl. VAT)

Accreditation
NQF - Level 4

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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.

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.

• 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

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

Order no 12221201
Price R8 700 (excl. VAT)
Accreditation NQF - Level 5

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A large percentage of spare parts sold for hydraulic plant 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 cutting short their 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

**Order no**
559449

**Price**
R8 600 (excl. VAT)

**Accreditation**
NQF - Level 3
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 equipments

Prerequisites
Hydraulics (1) Basic

Duration
4 days

Order no
573359

Price
R9 100 (excl. VAT)

Accreditation
NQF - Level 3

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Programmable Logic Controllers
Introduction

PLC111
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
a) Pneumatics (1) Basic
b) Electro - Pneumatics & experience in operating a PC with a Windows interface

Duration
3 days

Order no
561204

Price
R6 900 (excl. VAT)

Accreditation
NQF - Level 3

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Programmable Logic Controllers
CoDeSys: The standard in IEC 61131-3
V3.5

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 commands sets cause confusion and make mistakes 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
(a) Pneumatics (1) Basic
(b) Electro- Pneumatics & experience in operating a PC with a Windows interface

Duration
3 days

Order no
570612

Price
R9 900 (excl. VAT)

Accreditation
NQF - Level 3

Each participant receives a Festo CECC CoDeSys PLC and Software

PLC CoDeSys PLC281

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Programmable Logic Controllers
CoDeSys Analog and PID Control

PLC282
This course will enable service and commissioning personnel to work with analog signals and effectively optimise plant loop. In this course you will master the principles of automatic process control using the CoDeSys Festo PLE CECC - LK and the operation of the feedback loop to include proportional, integral and derivative control modes. Also advanced concepts of cascade, ratio feed forward control. 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 analog value processing
• Fundamental concepts of closed-loop control
• Optimising criteria
• Controller selection
• PID algorithm for digital control
• Multi-loop control
• Hands-on exercises
• Flow, level, temperature, pressure loops

Outcomes
The Participant:
• can perform an log 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

Order no
12221243

Price
R12 100 (excl. VAT)

Acreditation
NQF - level 5

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Servo and Stepper Motor Drives - Basic

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 (Toothbelt; Spindle; Ballscrew; 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; resolve)
- 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

Order no
562553

Price
R7 100 (excl. VAT)

Accreditation
NQF - Level 3

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East London | | | | | | | | | | | | 
Port Elizabeth | 10-12 | | | | | | | | | | |
Mechatronic Systems

AUT211
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 dearchiving 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 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

Order no
565671

Price
R9 400 (excl. VAT)

Accreditation
NQF - Level 5

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For many years robotics has been evolving fast, providing speed, precision, and quality in production processes. This course provides you with an insight into robotics 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 is able to:
- describe the mechanics behind robotics systems
- describe the working principles behind the control of movement and speed
- explain what a coordinate system is
- read and write a basic robotics sequence program
- identify and eliminate faults using the status display

Requirements
Electro-Pneumatics & Experience in operating a PC with a Windows interface

Duration
3 days

Order no
578435

Price
R9 400 (excl. VAT)

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Water Treatment

PA311

Our water and wastewater sector suffers from a lack of capacity and performance which impacts negatively on the environment, public health and economic process. Polluted domestic and industrial wastewater together with fertilisers 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

Order no

12272436

Price

R8 400 (excl. VAT)

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27
Organisation &
People

Organisation

An excellent company

We know what makes an excellent company:
A focus on customer satisfaction, corporate and quality strategy,
employee satisfaction, efficient processes, responsible and target-
oriented employee management, job-oriented qualification, positive
business results and a positive impact on society.

We will prepare your entire organisation for the new tasks you
will face.

Our consultants will advise your employees on the development of
an independent and autonomous working style. The aim of their work
is to enable companies to efficiently structure work, organisation and
qualification processes.

People

Bringing out our best side
Social skills and effective networks are the key to a successful
organisation.

In the future, both managers and specialists will be required to
continue developing not only their technical but also their social skills.

Knowing how to overcome difficult situations and support teams
throughout processes of change is becoming more and more
important. Festo will teach you how to positively design all levels of a
process in order to achieve a successful overall solution.
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 sensitises 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 instill 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, Management;

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 minimisation 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 - Optimisation 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

**Order no**

561209

**Price**

R4 600 (excl. VAT)

**Accreditation**

NQF - Level 5

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All Venues

For Inhouse Training Only
Maintenance Strategies and Total Productive Maintenance

LP141

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 maximise 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 loss
- Roles and self-image in maintenance
- Organisational structures for maintenance
- Comparison of maintenance strategies:
  - Event-oriented maintenance
  - Routine maintenance
  - Total Productive Maintenance (TPM)
  - Reliability-Centered Maintenance (RBM)
  - 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

Order no
559428

Price
R4 600 (excl. VAT)

Accreditation
NQF - Level 4

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Organisation Lean Production
Service Ambassador - Communication skills for service engineers

CO111

This course presents a compelling new approach to customer communications. Proven tools guide the service professional and develop the core skills needed for effective communication. The training course provides you, as a service engineer, with the skills to build relationships, enhance loyalty, discover opportunities and differentiate their business from the competition.

Target group: Maintenance, Trainer

Contents

- Identifying the ‘environmental factors’
- The core competencies of a professional and successful service engineer
- Comparing ‘modern consultative’ and ‘adversarial’ communication
- The communication cycle
- Key skills for ‘setting the stage’
- Strategic questioning skills
- Listening skills and the barriers to effective listening
- Identifying customer needs and expectations
- ‘Delivering the result’ - customer focus
- Achieving customer satisfaction and future commitment

Outcomes

The Participant:

- has developed an increased awareness of customer perceptions
- is able to apply the customer ‘communications cycle’
- has enhanced customer-focused communication skills
- has developed skills to help identify customer needs and expectations
- can identify ways to enhance the customer’s opinion of themselves and their company
- can develop a personal action plan to help implement benefits gained in daily working

Requirements

Practical understanding of the machines for which customer support is required as well as experience in visiting customers in an after-sales technical support role

Duration: 2 days

Order no: 12272438

Price: R4 600 (excl. VAT)

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My Name: BionicANT
My role model: RED ant

I was developed and created by the BLB (Bionic Learning Network) team of Festo, in partnership with universities, institutes and development companies. To start with, they took a close look at my role model, the red ant, and transferred the key function into the world of technology.

Pretty Impressive

Pretty Impressive! After all, ants are one of nature’s little wonders.

They live alongside millions of other ants in perfectly organised colonies with clear hierarchies and fixed rules. They can carry many hundred times their own body weight and it is truly impressive how perfectly it all works. Ants communicate with each other and coordinate their actions and movements with each other. They can make decisions themselves, but they always submit to the common goal, making almost anything possible. This results in completely new solutions for the Festo team. Today, I will show how we, the BionicANTS, can provide helpful ideas for the future of production. As is the case with my counterpart in the natural world, the red ant, my abilities to work with others and communicate with them, as well as my tiny body, are of particular interest. Take a closer look at how the Festo team created me.
Printed Electronics

Instead of laying cables inside my body, the electronic circuits and switches have been printed on the surface of my plastic body parts. This is done using a special technology known as MID technology. This means less space is required because no cables have to be integrated and the combination of the individual components is much simpler. The entire electronics system can be seen and traced at a glance.

3D Camera

In order to be able to grip an object properly, for example, a leaf or a piece of bark, we robot ants have a 3-D camera system built into our heads. This camera enables us to see the objects in front of us. It also helps us to avoid collisions with other ants or objects.

Structure

Each ant has six legs, a head, a torso and pincers by our mouths. We charge our batteries via our feelers, which have contact to a charging station. We are able to work for periods of up to half an hour.

- Length x Width x Height: 135 x 150 x 43 mm
- Weight: 105g
- Step size: 10mm
- Material, body and legs: Plastic components from a 3D printer
- Actuators for the pincers and legs: piezo ceramic bending transducers
- Stereo camera: Micro air vehicle (MAV), Delft University of Technology lab
- Radio module: JNtec

Working together makes things easier

Working together to move heavy loads is the secret. It sounds easy but it’s not! The important thing is that we artificial ants think intelligently and communicate with one another. By doing this, we can find a common strategy for transporting a large leaf, for example – something that could never be accomplished alone. What is decisive here is the software that was written for us. We network wirelessly with one another and agree on the task to be accomplished.

Piezo Technology

In the tiny actuators in our legs and pincers, piezo technology provides the movement. The trick is that the piezo components bend in one direction when an electric current is passed through them. This movement enables us to lift, lower and move our legs back and forth; it also enables us to open and close our pincers. A total of 18 piezo actuators are built into each ant. Piezo elements require very little energy to move, and can be controlled very precisely and very quickly. They also suffer practically no wear and tear and require very little space.
Learning Systems
Service with Value added

We support you and deliver advice and assistance. Whether you need information, are asking for advice before making an investment or have questions about everyday use of the products: we are always only a phone call away – and have been for more than 40 years now.

Low-cost industry quality
Brand-name quality at low prices. We always select products from industry and we do not use gadgets that are not up to the rigours of use in training.

Modular and future-proof
We build learning systems that are 100% modular. This means you can always expand them flexibly and make your investments future-proof without reaching a dead end.

Quality with no ifs or buts
All products (except consumables) come with a 2-year warranty. And if a part should cease to function years down the line, you can obtain spare parts from us quickly and easily, or else you can purchase a new part at a reduced price using our exchange service.

Didactic and design
Ergonomics, didactic concepts and design go hand-in-hand at Festo Didactic. Numerous international awards underline our commitment.

Teacher training, info events and special seminars for trainers
You can take part in free teacher training and info events. Alternatively, you can visit us at numerous trade shows around the world. What is more, there is a large number of fee-paying special seminars available for trainers.

Free software, demos and sample extracts
For example, EasyVeed is a new graphic 2D process simulation software that is available for download free of charge. It comes with numerous attractive examples for PLC training. You can sample many software products and all books free of charge on the Internet using test and demo versions.

Online configurations
Make the selection and ordering process simple. For example, you can configure laboratory furniture and EduTrainer® easily and conveniently on the Internet.

Free of charge online dictionary
Only Festo Didactic offers an extensive Dictionary of Automation in 6 languages, free of charge on the Internet.

Free symbol library according to DIN ISO 1219
More teaching aids are available to be downloaded from our website.

Your partner, worldwide
We speak your language! And we’re just around the corner – in more than 100 countries around the world. Advice and orders can be phoned, faxed, e-mailed or done via the Internet. Alternatively, give your technical consultant a call for a qualified needs analysis conducted onsite.
Education for Industrialisation
Engineering training for employability and productivity

- E-learning
- Blended Learning
- Teachware

- Robotics
- Mobile Robots
- Mechatronics
- PLC programming

- Pneumatics
- Electro-Pneumatics

- Process Instrumentation
- Waste water Treatment

- Hydraulics
- Mobile/Electro/Proportional Hydraulics

- CNC, Computer integrated manufacturing
- Learning factories
- Fitting Equipment
- Machinery

- Electrics
- Electronics
- Safety
- Motors
- Contractors
- Drives

- Lab Design
- Curriculum
- Consulting
- Market Surveys
General Conditions for Booking and Participation

We want booking a course to be easy and trouble-free for you. Attending a course should bring the participant the maximum possible benefit.

Consultation and registration

Make sure of your place on a course by registering as early as possible. The number of places is limited and registrations are dealt with on a first-come, first-served basis. However, if a course is oversubscribed, we make every effort to offer you a suitable alternative date. Our lines are open for telephone enquiries from Monday to Friday, 8.00 to 17.00.

Order confirmation

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

Cancellation

We reserve the right to change the location and/or time of events or to cancel them.

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

We shall only be liable for damage caused deliberately or by gross negligence on the part of our employees. Any other liability is excluded.

Copyright

Reproduction of course documents for non-approved purposes, distribution, sale or communication of their content to third parties is not permitted. The software used for exercises during the courses may not be copied or removed from the course location. Participants are not permitted to transfer their own software.

Book direct through e-mail: helen.pretorius@za.festo.com and sammy.kanye@za.festo.com
Trainers

Festo Didactic trainers are trained in education and didactic methods. They maintain a constant practical context as they are involved in technical consulting and supporting customer projects in addition to the courses.

Course documents

Extensive course documents provide an indispensable practical reference work.

Catering

The course fees include the course documents, lunch, snacks and drinks during the breaks.

Certification

A certificate recognised in the industry is awarded for successful completion of a course.

Venue and course times

Courses are held at Festo Didactic’s own modern fully equipped lecture rooms in all major cities.

Course days 08h00 - 16h00

How to find us

Festo Didactic Training and Consulting
22 Electron Ave
Isando
1600
Tel: 011 971 5586/5626
Fax: 011 974 9020
E-mail: helen.pretorius@za.festo.com

GPS co-ordinates for Festo HQ in South Africa are:
S26 08.129
E28 11.969

Consulting

Our customer advisors will be pleased to assist you with any questions on content, location and dates.

Simply call Festo Didactic
011 971 5586/5626

All courses are outcomes based. Festo Didactic is accredited by the Merseta.

www.festo.com
We would like to register for the following seminars:

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Method of payment (see planner for course prices) *VAT amount subject to legislation

☐ I am paying via an Electronic Funds Transfer (EFT) to Festo (Pty) Ltd for the amount of R

☐ I am supplying an official order number

Full payment to be received before course commencement unless an Order Number is provided.

Signature: __________________________ Date: __________ / _______ 2016

NOTE: We will confirm your booking by tel or by fax / email.
Festo South Africa

Johannesburg
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22-26 Electron Avenue, Isando
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(011) 971-5586
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E-Mail: didactic.za@festo.com
Service Line: 0860 033 786
(free of charge)

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086 003 3786
FAX 086 445 0269

Cape Town
101, Maitland, 7405
086 003 3786
FAX 086 445 0270

Port Elizabeth
14002, Sidwell, 6061
086 003 3786
FAX 086 445 0269

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7387, East London, 5200
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FAX 086 545 2616