

Training and Consulting
Range of courses for 2013
South Africa

FESTO



www.festo-didactic.com

“There is no end to learning”

Quote from the famous German composer and pianist, Robert Schuman (1810 - 1856)



Horst Weinert, Manager of Festo Didactic South Africa

Are your skills keeping pace with technology?

The Chinese saying “learning is like rowing upstream: not to advance is to drop back” is very relevant to our industry today. Opportunities for acquiring knowledge seem infinite, and more now than ever there is a need to expand our technical knowledge and skills so as to enable greater manufacturing competitiveness.

In helping to meet this need, Festo Didactic makes training real and relevant to participants. And that is why our hands-on training courses are in such high demand. Festo Didactic develops and delivers its

industrial courses in focused modules of technology, relevant to the workplace. Our basic courses accommodate the beginner wanting to know more about maintaining and optimising a machine, and the advanced courses cater for the more sophisticated machine builders, system integrators, technicians and engineers.

The Festo Didactic motto is to **teach tomorrow’s technology today**. On the industrial side, we like to partner with customers to bring the best possible solutions to particular needs. But the didactic side is essential to satisfy the

human capital needs necessary for industrial success. Didactic is the Greek word for teaching and the teaching fraternity use the word to refer to a way of transferring knowledge, a real way that always makes total sense and opens doors to a fascinating future.

We are pleased to offer you our training support and trust that this course planner will be the first step towards successful training and your increased productivity.

Sustainable commitment to people and technology

What do you do in 60 seconds?



Technology in 60 seconds

In 60 seconds one machine blow-moulds up to 2 000 PET bottles using high-pressure pneumatics. In the same amount of time, a different machine packages and sorts 900 chocolate sweets. In 60 seconds, a water treatment plant prepares enough drinking water to fill up to 1 000 bathtubs and a filling machine fills and seals 750 tubes of toothpaste. In 60 seconds, 150 stalks of asparagus go through a peeling machine with compressed air operated

double blades, 60 beer bottles receive metal clips via an electric handling system and up to 800 portions of gourmet salad find their way into containers. All over the world, machines and systems like these are in operation around the clock.

These gigantic numbers are achieved through a combination of ever more efficient automation technology components and systems and three basic technological procedures:

measurement, and open and closed-loop control. Together with proper understanding and maintaining of these systems they optimise factors such as cost, quality, and time. They make possible sensational cycle times and achieve product and process quality standards that could never be reached manually. Through their interaction, the consumption of materials and energy can be reduced to minimum.

... “As technology races ahead, don’t be left behind... let Festo Didactic help you to make the most of your 60 seconds”.



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
- Design, read and construct control circuits
 - Improve maintenance & upkeep of equipment
 - Fault find & repair machinery more efficiently

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

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

Technology & Organisation Course Overview

Technology

| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|--|--------------|---------------|-----------------------|-------|-------|-------|--------------|-------|-------|--------------|-------|-------|
| Pneumatics (1) Basic PN111 | | | | | | | | | | | | |
| Johannesburg | 23-25 | 20-22 | 18-20 | 17-19 | 15-17 | 12-14 | 3-5 24-26 | 21-23 | 18-20 | 16-18 | 13-15 | 11-13 |
| Durban | | 27... 27.. | ..1 ..1 | 24-26 | | 19-21 | | 14-16 | | 9-11 | | 4-6 |
| Cape Town | | | 6-8 | | | 5-7 | | 28-30 | | | 20-22 | |
| East London | | | | 3-5 | | | | | | 2-4 | | |
| Port Elizabeth | | 13-15 | | | 29-31 | | | | | | 6-8 | |
| Pretoria | | | 18-20 | | | | 24-26 | | | | | |
| Pneumatics (2) Maintenance PN121 | | | | | | | | | | | | |
| Johannesburg | | 13-15 | | 3-5 | | 5-7 | | 6-8 | | 2-4 | 27-29 | |
| Durban | | | | | 8-10 | | | | 25-27 | | | |
| Cape Town | | | 26-28 | | | | | 14-16 | | | | |
| East London | | | | | | | | | 18-20 | | | |
| Port Elizabeth | | | | | | 26-28 | | | | 23-25 | | |
| Pneumatics (3) Advanced PN122 | | | | | | | | | | | | |
| Johannesburg | | | | | 22-24 | | | | | 23-25 | | |
| Durban | | | | | | | | | 4-6 | | | |
| Cape Town | | | | | | | 17-19 | | | | | |
| Port Elizabeth | | | | | | | 31.. 31.. | ..2 | | | | |
| Electro - Pneumatics PN211 | | | | | | | | | | | | |
| Johannesburg | | 6-8 | 26-28 | | 29-31 | | 17-19 | | 11-13 | | 6-8 | |
| Durban | | | | | 15-17 | | | | | 23-25 | | |
| Cape Town | | | | 3-5 | | | | | | 2-4 | | |
| East London | | | | | | 19-21 | | | | | | |
| Port Elizabeth | | | 6-8 | | | 5-7 | | | 18-20 | | | |
| Energy Saving in Pneumatics PN361 | | | | | | | | | | | | |
| Johannesburg | | | | 15-16 | | | | 19-20 | | | | |
| Hydraulics (1) Basic HY511 | | | | | | | | | | | | |
| Johannesburg | 30.. 30.. | ..1 ..1 | 26-28 27.. 27.. | 24-26 | 22-24 | 19-21 | 17-19 | 14-16 | 11-13 | 9-11 | 6-8 | 4-6 |
| Durban | | | | 10-12 | | | 31.. 31.. | ..2 | | | 20-22 | |
| Cape Town | | | | 17-19 | | | | | | 16-18 | | |
| East London | | | | | | 12-14 | | | | | | |
| Port Elizabeth | | 20-22 | | | | | | 21-23 | | | | |
| Hydraulics (2) Advanced HY521 | | | | | | | | | | | | |
| Johannesburg | | | 13-15 | | 8-10 | 26-28 | | 6-8 | 25-27 | | 20-22 | |
| Durban | | | | | | | 10-12 | | | | | |
| Cape Town | | | | | | | | | 11-13 | | | |
| Port Elizabeth | | | | | | | | | | | 13-15 | |
| Hydraulics (3) Proportional HY132 | | | | | | | | | | | | |
| Johannesburg | | | | 10-12 | | | | | | 16-18 | | |
| Durban | | | | | | 26-28 | | | | | | |
| Cape Town | | | | | | | | 6-8 | | | | |
| Port Elizabeth | | | | | | | | | 25-27 | | | |
| Hydraulics (4) Maintenance HY142 | | | | | | | | | | | | |
| Johannesburg | | 6-8 | 18-20 | | 15-17 | | 3-5 | | 4-6 | | 27-29 | |
| Durban | | | | | 29-31 | | | | | 30.. 30.. | ..1 | |
| Cape Town | | | | | | | 24-26 | | | | | |
| East London | | | | | | | | 28-30 | | | | |
| Port Elizabeth | | | | | | 12-14 | | | | | | |

| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|---------------------------------|-----|--------|-------|-------|-------|-------|--------|-------|-------|--------|-------|-------|
| Mobile Hydraulics HY152 | | | | | | | | | | | | |
| Johannesburg | | | | 17-19 | | | | 21-23 | | | | |
| PLC Introduction PLC111 | | | | | | | | | | | | |
| Johannesburg | | 6-8 | | | 15-17 | | 24-26 | | 25-27 | | | |
| Durban | | | | | | | | | | 16-18 | | |
| Cape Town | | | | | | | | 21-23 | | | | |
| PLC CoDeSys PLC281 | | | | | | | | | | | | |
| Johannesburg | | 27...1 | | | 22-24 | | 31...2 | | | | 13-15 | |
| Durban | | | | | | | | | | | 27-29 | |
| Cape Town | | | | | | | | | | 30...1 | | |
| East London | | | | | | | 10-12 | | | | | |
| Port Elizabeth | | | 13-15 | | | 19-21 | | | 4-6 | | | |
| PLC Siemens S7 Part 1 PLC211 | | | | | | | | | | | | |
| Johannesburg | | 19-22 | | | 7-10 | | | 13-16 | | | | 3-6 |
| Durban | | | | 16-19 | | | | | | | | |
| Cape Town | | | 25-28 | | | | | | | | | |
| East London | | | | | | 25-28 | | | | | | |
| PLC Siemens S7 Part 2 PLC222 | | | | | | | | | | | | |
| Johannesburg | | | 12-15 | | | | 2-5 | | | | | |
| Durban | | | | | | | 16-19 | | | | | |
| Cape Town | | | | | | | | 27-30 | | | | |
| East London | | | | | | | | | | 26-29 | | |
| PLC Siemens S7 Analog PID PA201 | | | | | | | | | | | | |
| Johannesburg | | | | 23-26 | | | | | | | | 10-13 |
| Durban | | | 5-8 | | | | | | | | | |
| Cape Town | | | | | | | | | 3-6 | | | |
| Servo and Stepper Drives ED811 | | | | | | | | | | | | |
| Johannesburg | | 20-22 | | | 8-10 | | 3-5 | | 18-20 | | | 11-13 |
| Durban | | | | 3-5 | | | | | | 2-4 | | |
| Cape Town | | | | | 29-31 | | | | | | 6-8 | |
| Port Elizabeth | | | | 24-26 | | | | 28-30 | | | | |
| Mechatronic Systems AUT211 | | | | | | | | | | | | |
| Johannesburg | | | 5-8 | | | | | | | 22-25 | | |
| Durban | | | | | | 11-14 | | | | | | |
| Cape Town | | | | | | | 30...2 | | | | | |
| Process Instrumentation PA211 | | | | | | | | | | | | |
| Johannesburg | | 13-15 | | | | | 10-12 | | | | 20-22 | |
| Durban | | | | | | 5-7 | | | | | | |
| Cape Town | | | | | | | | | | 9-11 | | |
| Port Elizabeth | | | | 10-12 | | | | | | 30...1 | | |
| Water Treatment Module 1 PA311 | | | | | | | | | | | | |
| Johannesburg | | | 12-15 | | | | | | | | 12-15 | |
| Durban | | | | | | | | | 10-13 | | | |
| Cape Town | | | | | 21-24 | | | | | | | |
| Port Elizabeth | | | | | | | | 5-8 | | | | |
| Water Treatment Module 2 PA321 | | | | | | | | | | | | |
| Johannesburg | | | | | | | 9-12 | | | | | |

Organisation & People

| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|------------------------------|-----|-----|-------|-------|-----|------|------|-----|-------|--------|-----|-----|
| Lean Production LP121 | | | | | | | | | | | | |
| Johannesburg | | | 18-19 | | | | | | 16-17 | | | |
| Maintenance Strategies LP141 | | | | | | | | | | | | |
| Johannesburg | | | | 8-9 | | | | | | 28-29 | | |
| Service Ambassador CO111 | | | | | | | | | | | | |
| Johannesburg | | | | 10-12 | | | | | | 30...1 | | |

Technology



Triple skills

Experience

For over 33 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 | <ul style="list-style-type: none"> • 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 | <p>The Participant:</p> <ul style="list-style-type: none"> • 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 | 12065113 |
| Price | R5 400 (excl. VAT) |
| Accreditation | NQF - Level 3 |



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|-------------------------------|-------|-------|-------|-------|-------|-------|--------------|-------|-------|-------|-------|-------|
| Pneumatics (1) Basic PN111 | | | | | | | | | | | | |
| Johannesburg | 23-25 | 20-22 | 18-20 | 17-19 | 15-17 | 12-14 | 3-5 24-26 | 21-23 | 18-20 | 16-18 | 13-15 | 11-13 |
| Durban | | 27-29 | 24-26 | 21-23 | 18-20 | 15-17 | 12-14 | 9-11 | 6-8 | 3-5 | | 4-6 |
| Cape Town | | | 6-8 | | | 5-7 | | 28-30 | | | 20-22 | |
| East London | | | | 3-5 | | | | | | 2-4 | | |
| Port Elizabeth | | 13-15 | | | 29-31 | | | | | | 6-8 | |
| Pretoria | | | 18-20 | | | | 24-26 | | | | | |

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 | <ul style="list-style-type: none"> • 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 | <p>The Participant:</p> <ul style="list-style-type: none"> • 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 | 12065115 |
| Price | R5 600 (excl. VAT) |
| Accreditation | NQF - Level 3 |



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|---|-----|-------|-------|-----|------|-------|------|-------|-------|-------|-------|-----|
| Pneumatics (2) Maintenance PN121 | | | | | | | | | | | | |
| Johannesburg | | 13-15 | | 3-5 | | 5-7 | | 6-8 | | 2-4 | 27-29 | |
| Durban | | | | | 8-10 | | | | 25-27 | | | |
| Cape Town | | | 26-28 | | | | | 14-16 | | | | |
| East London | | | | | | | | | 18-20 | | | |
| Port Elizabeth | | | | | | 26-28 | | | | 23-25 | | |

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 12065114

Price R5 700 (excl. VAT)

Accreditation NQF - Level 4



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|-------------------------------|-----|-----|-----|-----|-------|------|-------|-----|-----|-------|-----|-----|
| Pneumatics (3) Advanced PN122 | | | | | | | | | | | | |
| Johannesburg | | | | | 22-24 | | | | | | | |
| Durban | | | | | | | | | 4-6 | 23-25 | | |
| Cape Town | | | | | | | 17-19 | | | | | |
| Port Elizabeth | | | | | | | 31.. | ..2 | | | | |

Electro - Pneumatics

| | |
|---------------|---|
| PN211 | After the course, you will be technically and didactically 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 | <ul style="list-style-type: none"> • 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 | <p>The Participant:</p> <ul style="list-style-type: none"> • 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 |
| Duration | 3 days |
| Order no | 12065116 |
| Price | R5 600 (excl. VAT) |
| Accreditation | NQF - Level 4 |



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|----------------------------|-----|-----|-------|-----|-------|-------|-------|-----|-------|-------|-----|-----|
| Electro - Pneumatics PN211 | | | | | | | | | | | | |
| Johannesburg | | 6-8 | 26-28 | | 29-31 | | 17-19 | | 11-13 | | 6-8 | |
| Durban | | | | | 15-17 | | | | | 23-25 | | |
| Cape Town | | | | 3-5 | | | | | | 2-4 | | |
| East London | | | | | | 19-21 | | | | | | |
| Port Elizabeth | | | 6-8 | | | 5-7 | | | 18-20 | | | |

Energy saving in pneumatic systems

NEW!

| | |
|--------------|--|
| 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 | <ul style="list-style-type: none"> • 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 | <p>The Participants can:</p> <ul style="list-style-type: none"> • 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 |
| Price | R3 600 (excl. VAT) |



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|-----------------------------------|-----|-----|-----|-------|-----|------|------|-------|-----|-----|-----|-----|
| Energy Saving in Pneumatics PN361 | | | | | | | | | | | | |
| Johannesburg | | | | 15-16 | | | | 19-20 | | | | |

Hydraulics (1) Basic

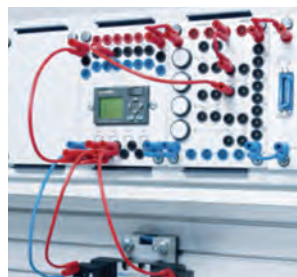
| | |
|---------------|---|
| HY511 | This course provides you with an insight into hydraulic hardware technology and its function. You will learn to produce and read circuit diagrams and set the speed, pressure and position for hydraulic drives. As in all courses, practical work is an important component. |
| Target group | Everyone who has to deal with hydraulic systems in their working environment |
| Contents | <ul style="list-style-type: none"> • 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 | <p>The Participant:</p> <ul style="list-style-type: none"> • 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 | 12065118 |
| Price | R6 800 (excl. VAT) |
| Accreditation | NQF - Level 3 |



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|---------------------------|-------|----------------------|-------|-------|-------|-------|----------|-------|-------|-------|-------|-----|
| Hydraulics (1) Basic | HY511 | | | | | | | | | | | |
| Johannesburg | | 30.. ..1 27.. ..1 | 26-28 | 24-26 | 22-24 | 19-21 | 17-19 | 14-16 | 11-13 | 9-11 | 6-8 | 4-6 |
| Durban | | | | 10-12 | | | 31.. ..2 | | | | 20-22 | |
| Cape Town | | | | 17-19 | | | | | | 16-18 | | |
| East London | | | | | | 12-14 | | | | | | |
| Port Elizabeth | | 20-22 | | | | | | 21-23 | | | | |

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 | <ul style="list-style-type: none"> • 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 | <p>The Participant:</p> <ul style="list-style-type: none"> • 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 | 12065119 |
| Price | R6 900 (excl. VAT) |
| Accreditation | NQF - Level 4 |



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|-------------------------------|-----|-----|-------|-----|------|-------|-------|-----|-------|-----|-------|-----|
| Hydraulics (2) Advanced HY521 | | | | | | | | | | | | |
| Johannesburg | | | 13-15 | | 8-10 | 26-28 | | 6-8 | 25-27 | | 20-22 | |
| Durban | | | | | | | 10-12 | | | | | |
| Cape Town | | | | | | | | | 11-13 | | | |
| Port Elizabeth | | | | | | | | | | | 13-15 | |

Hydraulics (3) Proportional

| | |
|---------------|---|
| 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 | <ul style="list-style-type: none"> • Basic principles of proportional hydraulics • Design, function and characteristics data for proportional, directional control, pressure and flow control valves • Generation of target values (analog 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 | <p>The Participant:</p> <ul style="list-style-type: none"> • 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 |
| Order no | 12221201 |
| Price | R6 900 (excl. VAT) |
| Accreditation | NQF - Level 5 |



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|-----------------------------------|-----|-----|-----|-------|-----|-------|------|-----|-------|-------|-----|-----|
| Hydraulics (3) Proportional HY132 | | | | | | | | | | | | |
| Johannesburg | | | | 10-12 | | | | | | 16-18 | | |
| Durban | | | | | | 26-28 | | | | | | |
| Cape Town | | | | | | | | 6-8 | | | | |
| Port Elizabeth | | | | | | | | | 25-27 | | | |

Hydraulics (4) Maintenance

HY142

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

12230632

Price

R6 800 (excl. VAT)

Accreditation

NQF - Level 3



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|----------------------------------|-----|-----|-------|-----|-------|-------|-------|-------|-----|------|-------|-----|
| Hydraulics (4) Maintenance HY142 | | | | | | | | | | | | |
| Johannesburg | | 6-8 | 18-20 | | 15-17 | | 3-5 | | 4-6 | | 27-29 | |
| Durban | | | | | 29-31 | | | | | 30.. | ..1 | |
| Cape Town | | | | | | | 24-26 | | | | | |
| East London | | | | | | | | 28-30 | | | | |
| Port Elizabeth | | | | | | 12-14 | | | | | | |

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 | <ul style="list-style-type: none"> • 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 | <p>The Participant:</p> <ul style="list-style-type: none"> • 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 | 3 days |
| Order no | 573359 |
| Price | R7 100 (excl. VAT) |
| Accreditation | NQF - Level 3 |



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|---------------------------|-----|-----|-----|-------|-----|------|------|-------|-----|-----|-----|-----|
| Mobile Hydraulics HY152 | | | | | | | | | | | | |
| Johannesburg | | | | 17-19 | | | | 21-23 | | | | |

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 | <ul style="list-style-type: none"> • 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 | <p>The Participant:</p> <ul style="list-style-type: none"> • 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) Electro - Pneumatics & experience in operating a PC with a Windows interface |
| Duration | 3 days |
| Order no | 12065117 |
| Price | R5 400 (excl. VAT) |
| Accreditation | NQF - Level 3 |



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|---------------------------|-----|-----|-----|-----|-------|------|-------|-------|-------|-------|-----|-----|
| PLC Introduction PLC111 | | | | | | | | | | | | |
| Johannesburg | | 6-8 | | | 15-17 | | 24-26 | | 25-27 | | | |
| Durban | | | | | | | | | | 16-18 | | |
| Cape Town | | | | | | | | 21-23 | | | | |

Programmable Logic Controllers

CoDeSys: The standard in IEC 61131-3 – Introduction

| | |
|---------------|---|
| PLC281 | 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 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 | <ul style="list-style-type: none"> • 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 | <p>The Participant:</p> <ul style="list-style-type: none"> • 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 | <p>(a) Pneumatics (1) Basic (b) Electro- Pneumatics & experience in operating a PC with a Windows interface</p> |
| Duration | 3 days |
| Order no | 570612 |
| Price | R5 600 (excl. VAT) |
| Accreditation | NQF - Level 3 |



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|---------------------------|-----|------|-------|-----|-------|-------|-------|-----|-----|-------|-------|-----|
| PLC CoDeSys PLC281 | | | | | | | | | | | | |
| Johannesburg | | 27.. | ..1 | | 22-24 | | 31.. | ..2 | | | 13-15 | |
| Durban | | | | | | | | | | | 27-29 | |
| Cape Town | | | | | | | | | | 30... | ..1 | |
| East London | | | | | | | 10-12 | | | | | |
| Port Elizabeth | | | 13-15 | | | 19-21 | | | 4-6 | | | |

Programmable Logic Controllers

Siemens – SIMATIC S7 Maintenance Part 1 (ST-7SERV1)

| | |
|---------------|---|
| PLC211 | This course is directed at users and maintenance personnel of SIMATIC S7 programmable controllers. You will learn the structure and mode of operation of the Simatic S7 as well as how to create simple logic association and sequence programs. A key element of the course is applying the programming terminology into practice, taking into account the various interfaces between the individual technologies, such as mechanics, electrics, pneumatics, sensors, and the PLC. |
| Target group | Maintenance, Engineering, Trainer |
| Contents | <ul style="list-style-type: none"> • The Simatic Step 7 system family • STEP 7 installation techniques • PLC installation and wiring techniques • Hardware handling • From process to project – the SIMATIC Manager • Hardware configuration and addressing of signal modules • CPU properties • Symbolic notation and symbols table • LAD / FBD / STL programming languages • Commissioning and monitoring / modifying variables • Linear / structured programming techniques • Debugging a program • Binary operations and gates • Flip flops • Edge detection • Number formats, load and transfer operations • Counters and timers • Rewiring of programs • Documentation functions, saving and archiving • Copying a program to a memory card |
| Outcomes | <p>The Participant:</p> <ul style="list-style-type: none"> • can configure and commission a Simatic S7 controller • can create, read out and change hardware configurations • can create and commission PLC programs with logic associations and sequences • can combine various program modules into structured programs • can find and eliminate faults and errors using the diagnostic buffer and status display |
| Prerequisites | Involvement in PLC maintenance |
| Duration | 4 days |
| Order no | 559381 |
| Price | R9 700 (excl. VAT) |
| Accreditation | Siemens Accredited, NQF - Level 3 Siemens Certificate issued |



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|------------------------------|-----|-------|-------|-------|------|-------|------|-------|-----|-----|-----|-----|
| PLC Siemens S7 Part 1 PLC211 | | | | | | | | | | | | |
| Johannesburg | | 19-22 | | | 7-10 | | | 13-16 | | | | 3-6 |
| Durban | | | | 16-19 | | | | | | | | |
| Cape Town | | | 25-28 | | | | | | | | | |
| East London | | | | | | 25-28 | | | | | | |

Programmable Logic Controllers

Siemens – SIMATIC S7 Maintenance Part 2 (ST-7SERV2)

PLC222

This course provides the fault-finding techniques required for maintenance and in-depth exercises with standard libraries for those wanting to handle organisation and data blocks, documentation, networking and analog as well as sequence control. This course focuses on the process to be automated. The material in this seminar will allow you to implement and maintain your automation solutions with the Simatic S7.

Target group

Maintenance, Engineering, Trainer

Contents

- Hardware commissioning
- Memory reset
- Variable tables
- Modifying outputs in STOP state
- STEP 7 project structure
- Cyclic and sequential program execution
- DB Data storage in data blocks
- Complex data types
- FB Functions and function blocks
- Multiple instance model
- Trouble shooting
- B, I, L stack handling
- Cross reference
- Break points in a program
- OB Organisation blocks
- Analog processing
- Documentation and printing
- Archiving a project
- Communication via MPI
- Totally Integrated Automation, examples of programming methods

Outcomes

The Participant:

- can understand and create complex program structures
- can find errors in complex programs quickly and efficiently
- can establish the reasons for machine stoppages with the aid of the PLC program
- can make changes and additions to programs developed by others

Prerequisites

Successful completion of S7 Maintenance Part 1 (ST-7SERV1)

Duration

4 days

Order no

559383

Price

R9 700 (excl. VAT)

Accreditation

Siemens Accredited, NQF - Level 4
Siemens Certificate issued



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|------------------------------|-----|-----|-------|-----|-----|------|-------|-------|-----|-----|-------|-----|
| PLC Siemens S7 Part 2 PLC222 | | | | | | | | | | | | |
| Johannesburg | | | 12-15 | | | | 2-5 | | | | | |
| Durban | | | | | | | 16-19 | | | | | |
| Cape Town | | | | | | | | 27-30 | | | | |
| East London | | | | | | | | | | | 26-29 | |

Programmable Logic Controllers

Siemens – SIMATIC S7 Analog and PID Control (ST-7PID)

| | |
|---------------|---|
| PA201 | This course will enable service and commissioning personnel to work with analog signals and effectively optimise plant loops. In this course you will master the principles of automatic process control using the Simatic S7 PLC and the operation of the feedback loop to include proportional, integral and derivative control modes. Also advanced concepts of cascade, ratio and 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 | <ul style="list-style-type: none"> • Fundamentals of analog value processing • Fundamental concepts of closed-loop control • Optimising criteria • Controller selection • PID algorithm for digital control • Continuous, quasi-continuous and discontinuous control • Multi-loop control • Hands-on exercises • Flow, level, temperature, pressure loops |
| Outcomes | <p>The Participant:</p> <ul style="list-style-type: none"> • can perform analog 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 analyze a control system • can identify the fundamentals of closed loop control technology • can operate a control system with a P.I.D controller • can choose the correct loop tuning method |
| Requirements | Successful completion of S7-7SERV2 or ST-7PRO1 courses |
| Duration | 4 days |
| Order no | 12221243 |
| Price | R11 300 (excl. VAT) |
| Accreditation | Siemens Accredited, NQF - Level 5 Siemens Certificate issued |



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|---------------------------------|-----|-----|-----|-------|-----|------|------|-----|-----|-----|-----|-------|
| PLC Siemens S7 Analog PID PA201 | | | | | | | | | | | | |
| Johannesburg | | | | 23-26 | | | | | | | | 10-13 |
| Durban | | | 5-8 | | | | | | | | | |
| Cape Town | | | | | | | | 3-6 | | | | |

Principles of Industrial Measurement, Control, Instrumentation and Process Valves

| | |
|---------------|--|
| PA211 | Process control is a unique part of industry that deals with the measuring and controlling of variables that influence materials and equipment during the development of a product. This course describes the working principles of these instruments that are used to do the measuring and controlling. |
| Target group | Everyone who has to deal with Instrumentation in their working environment. |
| Contents | <ul style="list-style-type: none"> • Basic principles of pressure, level, flow and temperature measurement • Calibration of measuring instruments • Control valves • Instrumentation Drawings and Symbols |
| Outcomes | <p>The Participant:</p> <ul style="list-style-type: none"> • can identify and explain the working principles of process measuring instruments • can identify control valves used for various applications • can read and identify piping and instrumentation drawings |
| Requirements | Basic knowledge of electricity |
| Duration | 3 days |
| Order no | 12217003 |
| Price | R5 600 (excl. VAT) |
| Accreditation | NQF - Level 3 |



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|-------------------------------|-----|-------|-----|-------|-----|------|-------|-----|-----|--------|-------|-----|
| Process Instrumentation PA211 | | | | | | | | | | | | |
| Johannesburg | | 13-15 | | | | | 10-12 | | | | 20-22 | |
| Durban | | | | | | 5-7 | | | | | | |
| Cape Town | | | | | | | | | | 9-11 | | |
| Port Elizabeth | | | | 10-12 | | | | | | 30...1 | | |

Water Treatment – Module 1

NEW!

| | |
|--------------|---|
| 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 | <p>Water purification and treatment</p> <ul style="list-style-type: none"> • Flocculation • Sedimentation • Chlorine dosing and disinfection • Activated carbon absorption • Biological treatment <p>Water supply</p> <ul style="list-style-type: none"> • Operation of pumps • Water transport to high tower • Water supply to different pressure zones <p>Water loss</p> <p>Wastewater transport</p> <ul style="list-style-type: none"> • Hydraulic of water flow in pipes • Transport of solids • Operation of sewer systems |
| Outcomes | <p>The Participant is able to:</p> <ul style="list-style-type: none"> • Influence coagulation, flocculation and sedimentation processes • Identify the load of solids and calculate the peak value • Create a sediment graph • Measure and interpret chlorine dosage • Understand activated sludge processes in wastewater treatment • Analyze an activated carbon percolation graph • 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 | 4 days |
| Order no | 12345678 |
| Price | R7 200 (excl. VAT) |



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|--------------------------------|-----|-----|-------|-----|-------|------|------|-----|-------|-----|-------|-----|
| Water Treatment Module 1 PA311 | | | | | | | | | | | | |
| Johannesburg | | | 12-15 | | | | | | | | 12-15 | |
| Durban | | | | | | | | | 10-13 | | | |
| Cape Town | | | | | 21-24 | | | | | | | |
| Port Elizabeth | | | | | | | | 5-8 | | | | |

Water Treatment – Module 2

NEW!

| | |
|--------------|--|
| PA321 | Huge amounts of money are spent to treat water to ensure it is safe for human consumption. More is being spent to distribute the same water to our homes, schools and hospitals. In the meantime, millions of litres of valuable water are lost by leakage due to excess pressure. New technologies have opened doors for more efficient methods of controlling the distribution of water. In addition, monitoring and controlling the processes in water and wastewater treatment plants is an important part to ensure good water quality. It is also essential that water and wastewater treatment plants are continuously optimised after being commissioned. This ensures that all the devices and units perform smoothly so that the water quality reaches the required level. Furthermore, it is important to pay attention to operational costs. An optimised system consumes less electrical power, results in reduced maintenance work and increased life-time of the operational units. |
| Target group | Technical staff and supervisors of water and wastewater treatment plants |
| Contents | <p>Adjustment of electronic amplifiers Collection and visualisation of the following parameters</p> <ul style="list-style-type: none"> • Filling levels • Volume rates • Line pressure • Electric current/voltage/power • Oxygen • Chlorine • pH-value <p>Interpretation of characteristic data parameters Quality management for water and wastewater treatment Impact of different control strategies on the overall energy consumption of pump stations Energy optimisation of aeration Efficient energy circuits Costs of air consumption Causes for waste of energy Energy management</p> |
| Outcomes | <p>The participant is able to:</p> <ul style="list-style-type: none"> • define and supervise quality goals related to water and wastewater treatment • manage the various disinfection and oxidation processes • take part in problem solving and decision making processes • identify relationships within the processes • run control systems • operate electronic equipment for water and wastewater process control • interpret different pressure zones and implement measures to ensure water quality • understand the technical structures of complex water and wastewater treatment plants • evaluate the relation between energy consumption and the cost of energy sources • apply efficiency measures in the consumption of air • correct failures that cause waste of energy • define and supervise quality goals related to energy consumption |
| Requirements | Water and Wastewater Treatment – Module 1 |
| Duration | 4 days |
| Order no | 12345678 |
| Price | R7 500 (excl. VAT) |



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|--------------------------------|-----|-----|-----|-----|-----|------|------|-----|-----|-----|-----|-----|
| Water Treatment Module 2 PA321 | | | | | | | | | | | | |
| Johannesburg | | | | | | | 9-12 | | | | | |

Servo and Stepper Motor Drives - Basic

ED811 (E831)

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

Duration

3 days

Order no

562553

Price

R5 600 (excl. VAT)

Accreditation

NQF - Level 3



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|--------------------------------|-----|-------|-----|-------|-------|------|------|-------|-------|-----|-----|-------|
| Servo and Stepper Drives ED811 | | | | | | | | | | | | |
| Johannesburg | | 20-22 | | | 8-10 | | 3-5 | | 18-20 | | | 11-13 |
| Durban | | | | 3-5 | | | | | | 2-4 | | |
| Cape Town | | | | | 29-31 | | | | | | 6-8 | |
| Port Elizabeth | | | | 24-26 | | | | 28-30 | | | | |

Mechatronic Systems

| | |
|---------------|--|
| AUT211 | <p>Planning, assembly, programming, commissioning operation, maintenance and troubleshooting of production systems are taught at various levels of complexity:-</p> <ul style="list-style-type: none"> - 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 | <ul style="list-style-type: none"> • 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 | <p>The Participant:</p> <ul style="list-style-type: none"> • 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 | 12064186 |
| Price | R7 400 (excl. VAT) |
| Accreditation | NQF - Level 5 |



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|----------------------------|-----|-----|-----|-----|-----|-------|-------|-----|-----|-------|-----|-----|
| Mechatronic Systems AUT211 | | | | | | | | | | | | |
| Johannesburg | | | 5-8 | | | | | | | 22-25 | | |
| Durban | | | | | | 11-14 | | | | | | |
| Cape Town | | | | | | | 30... | ..2 | | | | |

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 - A Business Simulation Game

| | |
|---------------|--|
| LP121 | <p>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.</p> |
| Target group | <p>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.</p> |
| Contents | <ul style="list-style-type: none"> • 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 | <p>The Participant:</p> <ul style="list-style-type: none"> • can analyse the causes of delivery problems and low productivity • can develop and implement ideas for meeting customer requirements and process improvements |
| Requirements | <p>Some experience in production control</p> |
| Duration | <p>2 days</p> |
| Order no | <p>561209</p> |
| Price | <p>R3 600 (excl. VAT)</p> |
| Accreditation | <p>NQF - Level 5</p> |



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|---------------------------|-----|-----|-------|-----|-----|------|------|-----|-------|-----|-----|-----|
| Lean Production LP121 | | | | | | | | | | | | |
| Johannesburg | | | 18-19 | | | | | | 16-17 | | | |

Maintenance Strategies and Total Productive Maintenance

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|---------------|---|
| 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 maximize availability in your own company. |
| Target group | Maintenance, Design/Engineering, Trainer, Management |
| Contents | <ul style="list-style-type: none"> • Production systems and their influence on maintenance • Six typical types of machine and system loss • Roles and self-image in maintenance • Organizational structures for maintenance • Comparison of maintenance strategies: <ul style="list-style-type: none"> - 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 | <p>The Participant:</p> <ul style="list-style-type: none"> • 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 | R3 600 (excl. VAT) |
| Accreditation | NQF - Level 4 |



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|------------------------------|-----|-----|-----|-----|-----|------|------|-----|-----|-------|-----|-----|
| Maintenance Strategies LP141 | | | | | | | | | | | | |
| Johannesburg | | | | 8-9 | | | | | | 28-29 | | |

Service Ambassador - Communication skills for service engineers

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|--------------|--|
| 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 | <ul style="list-style-type: none"> • 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 | <p>The Participant:</p> <ul style="list-style-type: none"> • has developed and 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 |
| Price | R3 600 (excl. VAT) |



| Course Title and Venue... | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|---|-----|-----|-----|-------|-----|------|------|-----|-----|--------|-----|-----|
| Service Ambassador C0111 Johannesburg | | | | 10-12 | | | | | | 30...1 | | |

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.



Book direct through e-mail: helen_pretorius@festo.com and sammy_kanye@festo.com

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.

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.
3 Day courses 08h00 - 16h00

How to find us

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

Should you require a detailed map please contact our service line

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

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



Please copy and fax this form to:

Festo Didactic
Training and Consulting
P.O. Box 255
Isando
1600

Seminar registration

Tel No: 011 971-5586/5500
Fax No: 011 974-9020
Service Line: 0860 033 786
(Free of charge)

We would like to register for the following seminars:

Seminar _____ Date _____

Location _____

Participants _____

Seminar _____ Date _____

Location _____

Participants _____

Seminar _____ Date _____

Location _____

Participants _____

Contact person _____

Telephone/fax _____

Company/department _____

Address _____

E-mail _____

Invoice address _____

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

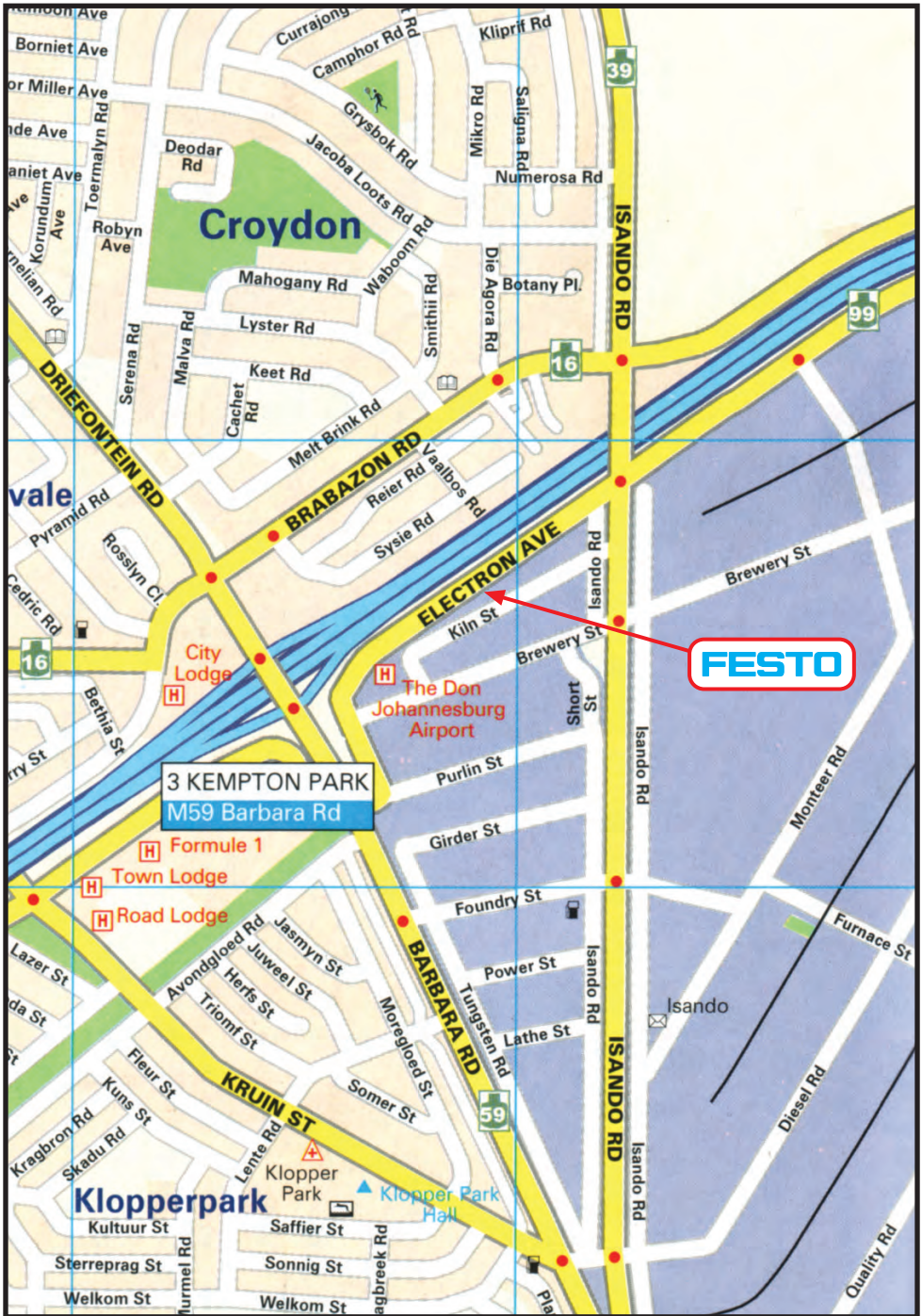
I enclose a cheque made payable to FESTO (PTY) LTD for the amount of R _____

I am supplying an official order number _____

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

Signature: _____ Date: _____ / _____ 2013

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



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(free of charge)

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55-57 Buro Crescent
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✉ 30060, Mayville, 4058
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FAX (031) 209-4646

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36 Gold Street
Northgate Business Park
Ysterplaat
✉ 101, Maitland, 7405
☎ (021) 593-8605
FAX (021) 593-4482

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17 Pontoon Road, Central
East London
✉ 7387, East London, 5200
☎ (043) 731-2095/6
FAX (043) 731-2094

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