



MAKING PLANTS SMARTER.

Education Services

Course Descriptions





Experitec, Inc. is pleased to offer to you, our customer, the finest in Emerson Process Management product and general process control courses available. Our goal is to provide the best training available in locations convenient to our customers.

Why wouldn't you want to train with the best? Our instructors have many years of experience in the subjects that they teach and are fully factory trained and certified by Emerson Process Management. Emerson Process Management is the leader in the process control industry with a large breadth of products and services designed to make you, our customer, a leader in your business.

Why travel to the ends of the earth for training? We place our courses in locations near your facilities to reduce the amount of time away from your job and your home. Our schedules include time for you to network with the other participants so that you can gain personally as well as professionally. Lunch is provided so you can spend your time relaxing with others in your career field.

What do I get out of my time invested? In addition to the educational experience, most of our courses qualify for Continuing Education Units that are needed by some to keep professional and job certifications. The units awarded are listed in each class description. You will also grow from the experience of the course instructors and fellow students.

What do I need to do to sign up? That's easy! Simply contact us at **888-874-6869** and ask to speak to someone about our Education Service offerings. We have a variety of payment options available to you and can assist you in making hotel arrangements if needed.

Thank you for your interest in Experitec, Inc.'s Education Service offerings. We look forward to hearing from you soon!

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Experitec Education Services

Gas Regulator Technician

Course 1101 CEU's: 2.1

Overview

This 3-day course is designed primarily for technicians responsible for the installation and maintenance of regulators and relief valves. Emphasizing hands-on training, this course teaches students to install, troubleshoot, and adjust gas regulators and relief valves. Students who complete this course will be able to:

- perform maintenance on regulators and relief valves
- troubleshoot field problems

Prerequisites

At least one year field experience with gas regulators is recommended.

Topics

- Self-Operated Regulators
- Pilot-Operated Regulators
- Overpressure Protection
 - Series Regulation
 - Monitors
 - Slam Shut Options
 - Relief Valves
- Regulator Failure Analysis
- Troubleshooting

Price \$1,550

ROC and FloBoss Engineering I

Course 1200 CEU's: 3.2

This Fisher Controls course is for engineers, technicians, and others involved in system operation and maintenance of ROC and FloBoss products.

Overview

This 4-1/2 day course provides an overall working knowledge of the ROC 300 series (ROC 312 and ROC 364) and an overview of FloBoss 407 of products. Students are presented with a comprehensive view of the hardware and software in the ROC family and then are taught how to completely configure a working unit.

Students who complete this course will be able to effectively configure, operate and maintain the ROC and FloBoss products.

Prerequisites

Students should have an understanding of personal computer (PC) operation.

Topics

- Overview ROC & FloBoss Hardware
- Overview of ROCLINK for Windows Software
- Configuring a ROC
- Basic Communication
- Operating the ROC Products
- Maintaining and Troubleshooting the ROC and Products
- Basic FST Use
- Discussing and Explaining Typical Oil & Gas Process Applications
- Calibration of A/I and A/O Modules

Price \$1,950

Experitec Education Services

ROC and FloBoss Troubleshooting and Problem Solving Course 1217 CEU's: 2.1

This Fisher Controls course is designed to provide ROC and FloBoss users with a broad experience in troubleshooting and field repair of ROC and FloBoss products.

Overview

This 3-day course teaches the student how to identify problems, determine their causes, and take the proper corrective action for quick resolution. In this lab-intense course, stations will be set up with faulty equipment and students will be challenged to identify and correct errors and malfunctions. The lab stations include common and not-so-common problem scenarios that have been collected from our field support group and from the factory repair department.

Prerequisites

Course 1200, Fundamentals of ROC and FloBoss Engineering I

Topics

- ROC/FloBoss Hardware Overview
- Configuration Software Review- all 3 programs
- Troubleshooting Procedures and Plans
- Planning Maintaining Schedules
- Problem Prevention

Price \$1,550

Control Valve Engineering I

Course 1304 CEU's: 2.8

This course is for engineers, technicians and others responsible for the selection, sizing, and application of control valves, actuators and control valve instrumentation.

Overview

This 4-1/2 day course explains how to select the correct control valve, actuator and accessories to operate through the full range of process conditions. This course covers general applications and emphasizes the sizing and selection methods for a broad variety of control valves and actuators. Students will solve various sizing and selection problems using published materials and Firstvue software, plus participate in equipment demonstrations and workshops. Students who complete this course will:

- select the proper valve characteristic for a given process
- choose suitable styles of control valves for an application
- size control valves and actuators
- select the best actuator for all applications
- properly apply positioners

Prerequisites

Some experience with industrial controls equipment including control valves and actuators would be helpful.

Topics

- Actuator Selection and Sizing
- Cavitation
- Control Valve Selection: Rotary and Sliding Stem
- Corrosion Resistant Valves
- Liquid Valve Sizing
- Positioners and Transducers
- Valve Application Guidelines
- Valve Characteristics
- Valve Packing Considerations
- Valve Noise (IEC Prediction Method)
- Gas Valve Sizing

Price \$2,050

Experitec Education Services

Valve Technician I

Course 1401 CEU's: 2.1 or 1404 CEU's: 3.2

Overview

This 4-1/2 day course explains how valves and actuators function and how they are installed and calibrated. It emphasizes installation, troubleshooting, parts replacement, and calibration of control valves, actuators, and positioners. Students spend over 50% of their time in hands-on workshops. Those who complete this course will be able to:

- correctly perform installation procedures
- perform basic troubleshooting
- properly apply and calibrate positioners
- change valve trim, gaskets and packing
- properly perform valve lapping

Prerequisites

Some experience in instrument calibration and in control valve maintenance, installation, and operation would be helpful.

Topics

- Control Valve Terminology
- Globe Valves
- Packing
- Actuators and Positioners
- Bench Set
- Seat Leak Testing
- Ball Valves
- Butterfly Valves
- Eccentric Disc Valves
- Special Service Valves
- Valve Characteristics
- Control Valve Noise and Cavitation

Price 1401: \$1,550

Price 1404: \$1,950

Valve Maintenance with DVC Calibration

Course 1456 CEU's: 2.8

Overview

This is a 4-day session. The first 2-days of the course will cover sliding stem and rotary valves and actuators. Topics will include valve and actuator setup, maintenance, repair and troubleshooting. The following 2 days will be focused on the installation, calibration of the 5000 and 6000 series digital valve controllers (DVC's) using the 275 handheld communicator. An overview of Valvelink Software will be included. Students spend 50% of their time in hands-on workshops. Students who complete this course will be able to:

- correctly perform installation procedures
- perform basic troubleshooting
- change valve trim, gaskets and packing
- install and mount a digital valve controller onto a sliding stem actuator/valve and rotary actuator/valve

• configure and calibrate FIELDVUE

Instruments with the HART Model

275/375 Communicator

Prerequisites Experience in instrument calibration

and in control valve maintenance, installation, and operation would be helpful.

Topics

- Control Valve Terminology
- Globe Valves/Packing
- Actuators
- Bench Set
- Ball Valves / Butterfly Valves / Eccentric Disc Valves
- Valve Characteristics
- Control Valve Noise and Cavitation
- DVC Theory of Operation
- HART Communication Signal
- FIELDVUE Instrument Installation
- HART Model 275/375 Handheld Communicator
- Instrument Configuration and Calibration
- Instrument Troubleshooting
- Control Loop Wiring Practices

Price \$1,950

Experitec Education Services

Instrument Technician

Course 1711 CEU's: 2.1

This course is for instrument technicians responsible for pneumatic and electronic instrument calibration, installation and troubleshooting.

Overview

This 3 day course covers the principles of operation, calibration and installation procedures for electronic and pneumatic instruments. Computer process simulations and live loops are used to demonstrate loop dynamics. Approximately 50% of this course consists of hands-on workshops. Students will:

- calibrate a variety of pneumatic and electronic instruments
- correctly perform installation procedures
- perform basic troubleshooting, basic controller tuning, and positioner application

Prerequisites Some experience in electronic and pneumatic instrument maintenance and calibration would be helpful, but not required.

Topics

- Actuators and Bench Set
- Controller Tuning
- Current to Pneumatic (I/P) Transducers
- Instrument Terminology
- Pneumatic Temperature Controllers (Filled Bulb)
- Pneumatic Pressure Controllers
- Pneumatic and Electro-Pneumatic Positioners
- Pneumatic Displacer Level Controllers
- FIELDVUE Digital Valve Controller
- Pneumatic and Digital Level Transmitters

Price \$1,550

Fundamentals of FIELDVUE Digital Instruments and the Handheld Communicators

Course 1755-3 CEU's: 2.1

This course is for technicians, engineers and others responsible for installing, calibrating and basic troubleshooting FIELDVUE and related instruments using the 275/375 Handheld Communicator. The primary focus of this course is to provide a comprehensive experience in managing DVC's using the HART 275/375 Handheld Communicator.

Overview

This 3-day course provides the fundamental skills necessary to:

- install and mount a DVC5000 & DVC6000 series positioner onto a Sliding Stem Actuator/Valve and Rotary Actuator/Valve
- configure and calibrate FIELDVUE Instruments with the HART Model 275/375 Communicator

This lecture/lab style course provides maximum class time with hands-on experience working with FIELDVUE instrumentation and the HART Model 275/375 Handheld Communicator. The proper configuration and calibration of the Digital Valve Controller will be featured.

Prerequisites

One to two years of experience and/or course 1400, (Valve Technician I).

Topics

- FIELDVUE Theory of Operation
- DVC5000 & DVC6000
- FIELDVUE Instrument Installation
- HART Model 275/375 Handheld Communicator
- Instrument Configuration and Calibration
- Instrument Troubleshooting
- Control Loop Wiring Practices & Tri-loop
- ValveLink Overview
- Introduction to ValveLink
- AMS ValveLink Tag and Database Issues
- Configuration with ValveLink
- Calibration with ValveLink
- AMS ValveLink Diagnostics
- HART Multiplexer
- AMS ValveLink Performance Diagnostics
- FIELDVUE & AMS ValveLink

Troubleshooting

Price \$1650

Experitec Education Services

Basic Vibration Analysis

Course 2031 CEU's: 2.8

This 4-day class is intended for the student who desires an integrated, hands-on approach to vibration analysis. Although this course is not product specific, students will be using CSI products for demonstration purposes.

Overview This is an introductory course, however the student will benefit greatly with prior understanding of basic vibration concepts. The class shows the student how to use machinery analyzer in conjunction with AMS Machinery Health software to analyze basic vibration defects. This course combines basic vibration analysis and basic machinery analyzer operation into one comprehensive approach to vibration problem solving. Students attending this course will receive a complimentary copy of the CSI Pocket Vibration Analysis Troubleshooter Guide.

Prerequisites Fundamentals of Vibration or up to 6 months of vibration experience is recommended.

Topics

- Vibration Theory and Background
- Vibration Terminology/Transducer Selection
- Data Collection Techniques
- The Class Shows Students How to Recognize Machine Defects such as:
 - Unbalance; - Shaft Misalignment
 - Looseness; - Rolling Element Bearing Defects; - Gear Problems; - Resonance;
 - Introduction to Electrical Defects
- Basic Machinery Analyzer Functions such as:
 - Utility Functions; - Program Functions;
 - Route Data Collection on Lab Equipment;
 - Setup Basics; - Off-Route Data Collection
- Computer Software Operations such as:
 - Loading Routes into the Analyzer
 - Transferring Data to the Computer
 - Basic Plot Data Analysis Tools

Price \$1,639

Tools for Optimizing Maintenance Performance

Course 2085 CEU's: 1.8

This course is for engineers and technicians looking to develop the future stages of their maintenance management strategy as well as those less experienced wishing to gain an understanding of the latest procedures and techniques available to them.

Overview

This 3-day course provides participants with an incisive understanding of maintenance best practice and the role of organizational and new technology policies. During the course, participants will gain a new vision of asset management and maintenance performance. The student will acquire the knowledge and skills to align asset management

for dramatic effect on the capabilities of the maintenance function and essential elements of a proactive maintenance and inspection organization.

Prerequisites

None

Topics

- Maintenance Obj. & Intro. to Key Tools
- Developing a Proactive Maintenance Plan
- The Asset Reliability Process & Program Implementation
- Managing/Measuring- Impact Maintenance Optimization

Price \$1,739

Experitec Education Services

Pressure, Temperature & Magnetic Flow Smart Transmitters

Course 2329 CEU's: 1.4

This 2-day course is designed for those individuals responsible for the installation, configuration, calibration, troubleshooting, and maintenance of the Rosemount Model 3051C Smart Pressure Transmitter, 3144P Smart Temperature Transmitter, and the 8700 Series Smart Magnetic Flow Transmitter. This course is a combination of courses: 2305, 2321, and 2340.

Overview

This course uses lectures and labs to maximize the hands on experiences and teach the student how to install, configure, calibrate, troubleshoot, and maintain the Rosemount Model 3051C, 3144P, and 8700 Series Smart Transmitter.

Topics Day 1

- 3051C Smart Pressure Transmitter
- 275/375 Operation, Digital Trims/Calibration

Topics Day 2

- Topics Specific to the 3144P Smart Temperature Transmitter
- 8700 Series Smart Magnetic Flow Transmitter

Note: Students must attend both days

Prerequisites: Knowledge of basic pressure fundamentals and analog pressure instrumentation.

Price \$995

3095MV Multi-Variable Transmitters

Course 2343 CEU's .7

This course is designed for those individuals responsible for the installation and maintenance of the Rosemount Fieldbus Flowmeter System.

Overview

This 1-day course uses lecture and labs to teach the student how to install and maintain the Rosemount Model 3095MV Smart Transmitters

The student will also learn the operation and interface capabilities of the Rosemount Model 275 or 375 Communication Interface. Student who complete this course will be able to:

- Identify transmitter parts and explain their functionality
- Explain the principles of operation of the transmitter
- Configure and test using the Rosemount Model 275 or 375 and the 3095MV Engineering Assistant Snap-on software
- Configure the compensated flow parameters using AMS with the 3095MV Engineering Assistant Snap-on software
- Properly install and troubleshoot the transmitters

Prerequisites: Knowledge of basic pressure and temperature fundamentals and instrumentation.

Topics

- DP Flow Fundamentals
- Overview and Principles of Operation
- Test Equipment Selection
- Sensor Selection and Wiring
- Bench Testing the Smart Transmitters
- AMS Software with the 3095MV Engineering Assistant Snap-On Software
- Rosemount Model 275/375 Operation and AMS
- Digital Trims/Calibration
- Installation and Start-Up
- Troubleshooting and Maintenance
- Configure, Wire and Setup the HART Tri-Loop

Price \$545

Experitec Education Services

MicroMotion Comprehensive Product Training

Course 2352 CEU's: 2.1

Overview

This 3-day course covers the installation, configuration, and calibration of the Micro Motion flowmeter system. Students will learn about Micro Motion's product line and will use and troubleshoot the RFT9739 and series 1000/2000 transmitters using the HC275, ProLink and Series 3000 interface devices. Students will perform a master reset of the RFT9739, use ProLink to configure the RFT9739, perform a flow calibration on the RFT9739, and solve troubleshooting problems. On the third day of class, the instructor will customize the class based on student need. Some topics that we may cover are the T-series and R-series sensors, the Series 3000 platform, and the IFT9701 and RFT9712 transmitters. Specific customer applications can also be reviewed during this time. Students who complete this course will be able to:

- Correctly install, configure and calibrate the flowmetering system
- Perform basic troubleshooting and diagnostic procedures

Topics

- Principles of Operation
- Installation Recommendations
- Transmitter Configuration
- Series 3000 Platform Configuration
- Sensor Calibration
- Troubleshooting

Price \$1,100

DeltaV Implementation I

Course 7009 CEU's: 3.2

This course is for users of DeltaV Operate Graphics.

Overview

This 4-1/2 day course covers a complete DeltaV system implementation. The student will be able to define system capabilities, define nodes, configure continuous and sequential control strategies, operate the system and define users and security.

Prerequisites

Microsoft Windows experience. It is recommended that prospective attendees new to process Automation Systems attend PlantWeb/DeltaV Introduction, Course 7101, or DeltaV Hardware & Troubleshooting, Course 7018

Topics

- System Overview
- Explorer
- Control Modules
- Control Studio
- Motor Control
- Regulatory Control
- WorkSpace
- System Operation
- Alarms & Process History View
- Sequential Function Charts
- Phase Logic Modules
- Security

Price \$3,095

Experitec Education Services

DeltaV Systems Batch Implementation

Course 7016 CEU's: 3.2

This course is designed for individuals responsible for configuring and commissioning DeltaV Batch Software. It is intended for users that have completed introductory courses 7009.

Overview

This 4-1/2 day course covers the implementation of a complete batch application. A process simulator will provide a batch application. Students will use DeltaV Batch Software to configure recipe entities including aliasing, phase logic, operations and unit procedures. Equipment entities will also be configured including units modules and process cells.

Prerequisites

Course 7009, DeltaV Implementation I

Topics

- Batch overview
- Unit phase
- Alias definition
- Unit module
- Process cell
- Operation
- Unit Procedure
- Procedure
- Batch Historian
- Version Control
- Campaign Manager

Price \$3,095

AMS Device Manager

Course 7022 CEU's: 2.1

This 3-day course is designed to teach technicians and engineers how to commission, calibrate, configure, maintain, and troubleshoot Fisher smart devices using AMS and the ValveLink SNAP-ON.

Overview

The course begins with an introduction to the features and functionality of the AMS software. It proceeds to discuss important database design and management issues, and then delves into device-specific techniques for commissioning, maintaining, and troubleshooting the following Fisher smart devices:

- DVC5000
- DVC6000
- DLC3000

Prerequisites

None, though an basic familiarity with Fisher smart devices will be beneficial.

Topics

- Introduction to AMS
- Getting Started with AMS
- Viewing and Modifying Devices
- Role and Function of the AMS Database
- AMS Database Architecture
- Database Design Considerations
- Database Maintenance Issues
- Managing Device Configurations
- Replacing and Deleting Devices
- AMS and the Hart Communicator
- Using the AMS Audit Trail
- Monitoring System Alerts
- DVC5000 View from AMS
- DVC6000 View from AMS
- ValveLink SNAP-ON Features and Functionality
- ValveLink SNAP-ON DVC Diagnostics
- AMS and the DLC3000

Price \$1,750

Experitec Education Services

Introduction to DVC and ValveLink

Course 7030

This 2-day course is designed to teach technicians and engineers how to commission, calibrate, configure, maintain, and troubleshoot Fisher DVCs using ValveLink SNAP-ON.

Overview

The course begins with an introduction to the features and functionality of the ValveLink software. It proceeds to discuss device-specific techniques for commissioning, maintaining, and troubleshooting the following Fisher smart devices:

- DVC5000
- DVC6000
- DVC2000

Prerequisites

None, though an basic familiarity with Fisher terminology will be beneficial.

Topics

- Introduction to ValveLink
 - Getting Started with ValveLink
 - Connecting to Devices
 - DVC5000 View from ValveLink
 - DVC6000 View from ValveLink
 - DVC2000 View from ValveLink
 - ValveLink SNAP-ON Features and Functionality
 - ValveLink SNAP-ON DVC Diagnostics
- Price** \$895

DeltaV Implementation for System Integrators

Course 7070

Overview

This 4-day course is designed for System Integrators configuring and commissioning DeltaV automation systems in a continuous environment.

This course covers the implementation of a DeltaV system used in continuous processes. Upon completion of this course the student will be able to define system capabilities, define nodes, configure continuous and sequential control strategies, operate the system & define users & security.

Prerequisites

Microsoft Windows experience. It is recommended that prospective attendees new to process Automation Systems attend PlantWeb/DeltaV Introduction, Course 7101, or DeltaV Hardware & Troubleshooting, Course 7018.

Schedule:

Course requires a minimum of eight students. If interested, please email your interest to education@experitec.com and we will communicate the session's dates when there are enough students to fill the class.

Price \$4,150

Experitec Education Services

DeltaV Advanced Control

Course 7201 CEU's: 3.2

Overview

This 4-1/2 day course introduces students to the advanced control tools available within DeltaV and how they may be used to improve plant operations. The principal technology that is utilized in each product will be discussed. The areas of improvement that may be achieved will be detailed. Also, each student will gain hands on experience with these tools in class exercises based on realistic process simulations.

Prerequisites

Courses 7101, PlantWeb/DeltaV Intro. or 7009, DeltaV Implementation I or equivalent field experience.

Topics

- The Control Foundation in DeltaV
 - Traditional Tools e.g. Override, Cascade, Ratio
 - Improvements Provided by Advanced Control
- DeltaV Inspect
 - Detection of Abnormal Conditions
 - Variability Index, Utilization
- DeltaV Tune
 - Tuning Response, Robustness
 - Expert Options e.g. Lambda, IMC
- DeltaV Fuzzy
 - Principles of Logic Control
 - FLC Function Block, Tuning
- DeltaV Neural
 - Creation of Virtual Sensor
 - Data Screening, Training
- DeltaV Predict
 - MPC for Multi-Variable Control
 - Model Identification, Data Screening
 - Simulation of Response, Tuning
- DeltaV Simulate
 - Operator Training and Engineering
 - Using High Fidelity Process Simulation

Price \$2,650

EnTech - Process Control for Engineers I (PCE I)

Course 9030 CEU's: 3.2

This course is for those who have responsibility for process control design and implementation, process optimization, or process design and troubleshooting.

Overview

PCE I is a 4-1/2 day course that provides the fundamental theory governing process dynamic behaviour, control system operation and controller tuning. Course material is based on experience gained in process variability optimization work and is based on modern control engineering concepts coupled with practical process application knowledge. This course presents a systematic approach to optimizing the control of a process unit operation in order to manufacture uniform product more efficiently. High fidelity process simulators are used as the basis for the labs and simulation analysis.

Prerequisites An engineering degree or equivalent knowledge/functionality in the mathematics to understand concepts below.

Topics

- Process Dynamics -Steady State/Dynamic and Linear/Non-Linear
- First Order Process; Process Deadtime
- Second Order System Model
- Integrating Process Model
- Nonlinearity- Process Dy./Final Cntrl Elem.
- Laplace Transform and Transfer Functions
- Feedback Control and PID Controllers
- Tuning PID Controllers - QAD Methods, Lambda Tuning
- Tuning PI Controllers - Lambda Tuning
- Root Locus Analysis
- Frequency Response - Sinusoidal Inputs, Bode Plots;Setpoint & Load Response
- Level Control - Lambda Tuning
- Tuning Interacting Control Loops & Midranging Control
- Useful Process Control Concepts
- Tuning Coordination Concepts for Unit Operation Optimization

Price \$2,095

Experitec Education Services

EnTech - Modern Loop Tuning

Course 9032 CEU's: 2.8

This course is for those responsible for maintaining

process control performance using instrumentation and control loop tuning.

Overview MLT is a 4-day on-site or registration course that introduces participants to effective methods for determining optimal tuning

parameters for regulation of processes.

The non-oscillatory EnTech tuning techniques, based on Lambda concepts, are taught with a focus on minimizing process variability.

Effectiveness is gained by the implementation of a tuning strategy that matches control element

dynamics to process operating requirements.

Participants learn how to recognize acceptable/unacceptable control loop performance

and to identify the most common source of problems. Fundamental tuning concepts, including the PID controller, process dynamics, valve motion characteristics (backlash and stiction),

setpoint tracking and regulation, minimum variance, integrating processes, and level control are reviewed/demonstrated using case study examples.

Prerequisites Some experience with process instrumentation and control is helpful.

Topics

- Process Dynamics - Control Loops, Bump Tests, Process Responses, First Order, Gain, Time Constant, Deadtime, Filtering, Non-Linearities, Control Res., Valve Dynam.
- PI Controller Tuning First Order Processes - Automatic Control, PID Equations, Tuning Methods, Lambda Tuning, Filtering
- Setpoint/Disturbance Responses - Regulatory Control, Setpoint Tracking, Frequency Response- Cascade Control and Interactive Loops
- Tuning Level Controllers for Load Recovery - Integrating Processes, Tuning for Load Recovery, Setpoint Responses, Dampening
- Hands-on Labs, Using a High Fidelity Process Simulator, Provide the Student with an Opportunity to Exercise all the Loop Tuning Concepts Presented

Price \$2,095