

Advanced Process Control Techniques Implementation



Course Overview

Course number: 4517

Course length: 4.5 days

This course provides a thorough grounding in the conventional advanced control techniques, with emphasis on how to put theory into practice. A variety of life-like plant simulations are provided.

Course Benefits

- To teach the theory and practical application of advanced control technology.
- Hands on practice with process control simulations.

Course Delivery Options

- In-Center Instructor-Led Training.
- On-Site Instructor-Led Training.

Who Should Take This Course?

Process Control Engineers

- Responsible for tuning control loops.
- Responsible for maintaining process controls.

Prerequisite/Skill Requirements

Desirable Skills and/or Experience

- Familiarity with Plant, process, and controls.
- Exposure to process control loop tuning techniques.

Course Topics

Participants will learn...

- **Process Dynamics:**
 - Gain, Deadtime and Lag.
 - Deriving Process Dynamics.
- **Control Algorithms and Tuning:**
 - Feedback Control.
 - On/Off Control.
 - Proportional Control.
 - Integral Control.
 - Derivative Control.
 - Trail and error tuning.
 - Manipulated Variable Overshoot.
 - Open-loop Tuning Methods.
 - Other Algorithms.
 - Latest technology and Robust PID.
- **Digital Filtering.**
- **Level Control:**
 - Types of level control.
 - Tight level control.
 - Averaging level control.
 - Error squared algorithms.
 - Non-linear Algorithms.
- **Furnace Control and Feedforward:**
 - Types.
 - Tuning.
 - Balancing methods.
- **Deadtime Compensation:**
 - Tuning PID for deadtime.
 - Predictor forms.
- **Introduction to Quality Control:**
 - Cut and Separation.
 - Location of tray temperature.
 - Inferential Control.
 - Temperature/Pressure Correction.
 - Model Based control.
 - Dual composition control.
 - Relative gain analysis.
 - Decoupling.
- **Adaptive Control:**
 - Tuning PI Algorithm for non-linear system.
 - 2 band, 3 band gain scheduling.
 - Programmed adaptive control.
 - Model reference adaptive control.
 - Self tuning controllers.
- **Constraint Control:**
 - Incentives.
 - Steadystate.
 - Dynamic single PID.
 - Dynamic multiple PID.
 - Smart selector switching.
 - Hard and soft constraints.
 - Constraint modification and augmentation.
- **Introduction to Multivariable Predictive Control:**
 - How it works in simple terms.
 - Degrees of freedom.
 - Where MVPC should be used.
 - MVPC application.
 - Independent and Dependent Variable specification.
 - The Step response model.
 - Step test methods.
 - Model identification.

- **Optimization:**
 - Hierarchy.
 - Using RMPCT.
 - DQP Optimization.
 - Rigorous model based optimization.
- **RMPCT Introduction, Controller structure, robust control and tuning.**
- **Advanced Control Methodology, Advanced Control Standards and QA.**

Additional Information

For additional information, please contact
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