

**Course Overview:**

Control in process industries refers to the regulation of all aspects of the process. Precise control of level, temperature, pressure and flow is important in many process applications. This course introduces you to advanced control in process industries, explains why control is important and identifies different ways in which precise control is ensured for main process equipment such as reactors, pumps, compressors, fired heaters and heat exchangers just to name a few.

**Course Objective:**

- Understand process dynamics and show their relevance to controller tuning.
- Describe the inner workings of PID controllers.
- Recognize different controller types, algorithms, and options, and describe when to use each.
- Apply the appropriate tuning techniques for different process types and tuning objectives.
- Employ techniques for quickly assessing the performance of control loops.
- Identify control valve and instrumentation problems.
- Find sources of process nonlinearity.
- Recognize performance issues that are not related to control loop problems.
- Identify how and when to apply cascade and feedforward controls.
- Understand the interaction of feedforward and cascade
- Understand the design, use and tuning of ratio and override controls.
- Optimize control loop performance.

**Course Outline:**

- Do we need to control at all ?
- Principles of equipment-wise control Pipe control systemControl of a single pipeControl of pressure in a pipeControl of flow in a pipeFlow mergingFlow splittingCentrifugal pump controlControl valve vs Variable Frequency Drive (VFD) for centrifugal pumpsMinimum flow control for centrifugal pumpsPositive displacement pump controlControl by a recirculation pipe for PD pumpsVariable Speed Drive (VSD) control for PD pumpsControl by stroke adjustment for PD pumpsCompressor control systemCompressor capacity controlCompressor anti-surge controlHeat transfer equipment controlHeat exchanger direct control systemHeat exchanger bypass control systemReactor temperature controlAir cooler controlHeat exchanger for heat recoveryHeat exchanger back pressure controlBasic fired heater controlComplex fired heater controlContainer and vessel controlContainer blanket gas control
- Introduction to Advance Process Control (APC)
- What is APC?
- Case Study: An illustration through Distillation Column
- APC: Advantages, Applications and Extraction
- APC: Implementation Steps
- Functional Design of APC Controller

**Training Language:**

EN / AR

**Training Methodology:**

- Presentation & Slides
- Audio Visual Aids
- Interactive Discussion
- Participatory Exercise
- Action Learning
- Class Activities
- Case Studies
- Workshops
- Simulation

- Cost Benefit Analysis of APC
- Evolution of APC

**Who Should Attend:**

- Process control engineers & technicians
- Instrumentation engineers & technicians
- Design engineers & technicians
- Piping engineers & technicians
- Maintenance engineers & technicians