Course Title: Control System Techniques in Equipment Design and Operations

Course ID:	Course Type:
CH762	Instructor-led (classroom) Course
http://www.aiche.org/ch762	

Course Schedule

Day One

8:00 – 8:30	Registration
8:30 – 10:00	Automatic Control Systems o Evolution of control systems o Principles of control systems o Block diagram representation and manipulation o Transfer function o Open-loop control o Feedback and closed-loop control
10:00 – 10:15	Morning Break
10:15 – Noon	Mechanical, Electrical and Fluid Power Control Components o Define mechanical vibrating elements o Electrical and electronic components o Liquid, gas flow and thermal control elements o Combined electro-mechanical and electro-hydraulic components
Noon – 1:00	Lunch Break
1:00 – 3:00	Mechanical, Electrical and Fluid Power Control Components (cont.) o Electrical circuits o Fluid circuits o Impact of resonant frequency o Potential sources of forced excitation o Illustrated examples to control output gain and bandwidth o Frequency and transient response o Analogy between mechanical, electrical and hydraulic control systems o Example problems and Class quiz

3:00 – 3:15	Afternoon Break
3:15 – 5:00	Control Methods o Analog and digital control

Day Two

8:30 – 10:00	Control Methods – *Continued* on Regulator and follow-up methods o Process control o Sequential and numerical control
10:00 – 10:15	Morning Break
10:15 – Noon	Sensors for Detection and Measurement o Accuracy, sensitivity and speed of measurement o Signal conditioning o Discrete sensors and transducers o Continuous sensors
Noon – 1:00	Lunch Break
1:00 – 3:00	Valve, Manipulator and Actuator o Proportional and pilot operated control valves o Pressure relief and direction flow control and servo valves o DC, induction and synchronous motors o Hydraulic and pneumatic cylinder and motor o Oscillating actuator
3:00 – 3:15	Afternoon Break
3:15 – 5:00	Controller Design o Ramp and lag processes o Dead time, delay and compensation o Process characteristics o Ultimate cycle method of controller design o Self-tuning adaptive controllers o Concentration, temperature and level control in blending and heating process

