Basic Instrumentation
This five-day course provides technicians with an understanding of basic instrumentation theory and application.

I. Fundamentals of Electronic Instrumentation
   · Electronic Transmitters
   · Electronic Controllers
   · Common Electronic Circuits
   · Power Supplies
   · Oscillators

II. Instrumentation Amplifiers
   · Noise and Drift
   · Discrete Component Instrument Amplifiers
   · Chopper Input DC Amplifier
   · Integrated Circuit Instrument Amplifiers

III. Electronic Transmitters
   · LVDT Motion to Current Transmitters
   · Force Balanced Motion to Current Transmitters
   · Capacitive Motion to Current Transmitters
   · Resistance to Current Transmitters
   · Motion to Resistance to Current Transmitters
   · EMF to Current Converters

IV. Transmission of Control Signals by Wire
   · Electric Signal Noise
   · Capacitive Coupled Noise
   · Inductive Coupled Noise
   · Directly Coupled Noise
   · Noise Elimination
   · Single Ended Grounded
   · Single Ended Floating
   · Balanced Floating
   · Noise Reduction

V. Electronic Controllers
   · Physical Arrangements-Front
   · Physical Arrangements-Side
   · Controller Block Diagram
   · Controller Proportional Response
   · Controller Proportional plus Integral Response
   · Controller Proportional plus Integral plus Derivative Response
   · Controller Output
   · Characteristics of Commercial Controllers
   · Bailey Type 701
   · Westinghouse Type 7300
   · Foxboro Spec. 200 Series Control Unit

VI. Electronic Control Arrangements
   · Basic Control Channel
   · Control Valves
   · Pneumatic Control Valve Actuators
   · Electro-Hydraulic Actuator
   · Manual Actuators
   · Valve Positioners
   · Electric Proportional Valve Actuators
   · Solenoid Actuators
   · Electrical Power Control
   · Process Control Loops
   · Temperature Control Loops
   · Pressure Control Loops
   · Flow Control Loops
   · Level Control Loops
· Cascade Control
· Ratio Control
· Feedforward Control

**VII. Transducers and Converters**
· Pneumatic to Current Voltage Converter
· Electronic to Pneumatic Transducers