# Process Measurement and Control

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This five-day course begins with a look at fundamentals of electronic instrumentation. Instrument amplifiers, electronic transmitters, transmission of control signals by wire, electronic measuring instrument arrangements are thoroughly describe

### I. Electronic Instrumentation Fundamentals

- Electronic Transmitters and Controllers
- Common Electronic Circuits
- Power Supplies
- Oscillators

### II. Instrument 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 and Floating
- Balanced Floating
- Noise Reduction
- Common Mode Rejection Ratio
- Electronic Signal Ranges
- Instrument Supply Voltages
- Signal Cable Installation

### V. Electronic Measuring Instrument Arrangements

- Process Connections
- Instrument Mounting
- Basic Measurement Loops
- Temperature Measuring Channel
- Pressure Measuring Channel
- Flow Measuring Channel
- Level Measuring Channel
- Analytical Measurement Channel
- The Electronic Recorder and Alarm

### VI. Electronic Controllers

- Physical Arrangements (Front and 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