Instrumentation

Electrical Systems for Instrumentation (12.5 Hours)
Trainee $20
Instructor $20
(Module ID 12116-14) Covers basic electrical concepts and terms, DC circuit calculations, electrical measuring instruments, and electrical wiring.

Fasteners (7.5 Hours)
Trainee $20
Instructor $20
(Module ID 12106-14) Explains how to properly identify, select, and install threaded and non-threaded fasteners and anchors used in instrumentation work.

Gaskets, O-Rings, and Packing (10 Hours)
Trainee $20
Instructor $20
(Module ID 12108-14) Teaches how to recognize, select, and properly install gaskets, packing, and O-rings. Covers the various materials used in gaskets and O-rings, along with their applications and limitations.

Lubricants, Sealants, and Cleaners (7.5 Hours)
Trainee $20
Instructor $20
ISBN 978-0-13-378844-0
(Module ID 12109-14) Covers the proper use, storage, handling, and safety practices associated with various lubricants, cutting fluids, sealants, and cleaners. Includes coverage of the tools and materials used in applying lubricants and cleaning products.

Steel Piping Practices (10 Hours)
Trainee $20
Instructor $20
(Module ID 12111-14) Introduces types of tubing, tubing materials, fittings, and tools. Covers proper storage and handling, cutting, deburring, reaming, bending, and joining of tubing.

Hoses (7.5 Hours)
Trainee $20
Instructor $20
(Module ID 12113-14) Describes different types of hoses and related fittings, along with proper storage and handling. Includes instructions for cutting hoses and installing standard reusable fittings.

Temperature, Pressure, Level, and Flow (15 Hours)
Trainee $20
Instructor $20
(Module ID 12110-15) Examines the characteristics of temperature, pressure, level, and flow, and describes the units of measure for each variable. Introduces common devices used to measure these process variables and the basic principles of operation for each device.

Instrument Fitter’s Math (15 Hours)
Trainee $20
Instructor $20
(Module ID 12301-15) Discusses the application of right triangles in bending and installing tubing and conduit as it applies to instrumentation. Shows how to use a scientific calculator in applying instrumentation piping and fitting math.

Instrument Drawings and Documents, Part Two (17.5 Hours)
Trainee $20
Instructor $20
ISBN 978-0-13-448259-0
(Module ID 12202-15) Covers reading and interpreting piping and instrumentation drawings, loop sheets, flow diagrams, isometrics, and orthographics to enable the identification of types of instrumentation and the specifications for installation.

Test Equipment (10 Hours)
Trainee $20
Instructor $20
(Module ID 33205-10; from Electronic Systems Technician Level 2)

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Instrumentation Level 2 (continued)

Protective Measures for Instrumentation  
*(20 Hours)*  
Trainee $20  
Instructor $20  
(Module ID 12308-15) Covers protective measures applied in instrumentation installations, including heat tracing, chemical treatment, and insulation.

Layout and Installation of Tubing and Piping Systems  
*(35 Hours)*  
Trainee $20  
Instructor $20  
(Module ID 12302-15) Introduces piping and tubing layout procedures. Explains the steps in creating a hand-drawn isometric drawing that can be applied in the piping and tubing installation. Introduces methods and procedures used to measure, cut, and bend support piping and tubing.

Instrument Air Filters, Regulators, and Dryers  
*(7.5 Hours)*  
Trainee $20  
Instructor $20  
(Module ID 12210-15) Presents the construction, operation, and use of filters, regulators, and dryers. Covers identification and selection of the correct component for installation using applicable specifications and schematics.

Instrumentation Electrical Circuity  
*(25 Hours)*  
Trainee $20  
Instructor $20  
(Module ID 12305-16) Describes various types of series and parallel circuits; resistance, inductance, and capacitance in AC circuits; DC power supplies; analog and digital signals; and common applications of electrical and electronic circuitry.

Relays and Timers  
*(10 Hours)*  
Trainee $20  
Instructor $20  
(Module ID 12208-16) Presents the principles of operation and applications of various relays and timers. Also reviews the selection process for these devices.

Switches and Photocell Devices  
*(10 Hours)*  
Trainee $20  
Instructor $20  
(Module ID 12209-16) Covers the principles of operation and applications of switches and photoelectric devices in the instrumentation environment.

Grounding and Shielding of Instrumentation Wiring  
*(10 Hours)*  
Trainee $20  
Instructor $20  
ISBN 978-0-13-448291-0  
(Module ID 12306-16) Teaches the basic concepts of grounding and shielding, including wire and cable identification. Defines various types of noise that can be induced into instrumentation wiring and describes the methods used to reduce or eliminate it.

Process Control Theory  
*(25 Hours)*  
Trainee $20  
Instructor $20  
(Module ID 12204-16) Describes the principles of process control and how various types of control loops are applied. Discusses ON-OF and modulating control schemes. Explains how process control principles are applied to flow, level, temperature, and process control loops.

Controllers  
*(10 Hours)*  
Trainee $20  
Instructor $20  
(Module ID 12206-16) Covers the theory of operation and the application of common process controllers, including both pneumatic and electronic devices.

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**Distributed Control Systems** (15 Hours)
Trainee $20  
Instructor $20  

(Module ID 12407-16) Surveys DCS technologies, including an overview of their development. Discusses key components, fieldbuses, servers, and human-machine interfaces. Also introduces maintenance and the increasingly important aspect of DCS security.

**Analyzers and Monitors** (30 Hours)
Trainee $20  
Instructor $20  

(Module ID 12409-16) Introduces the key concepts of chemistry, with an emphasis on their application in instrumentation. Explains crucial physical and chemical properties of matter. Discusses the different analytical methods used in industry to assess processes. Includes pH, conductivity, ORP, gas analysis, and particulate counts. Explores specific instruments and techniques.

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