



## Instrumentation, Controls and Electrical Systems Overview for Non-Electrical Engineers - ICE-21

### COURSE

#### About the Course

This course provides an introduction and overview of electrical systems, instrumentation, process control, and control/safety systems typically encountered in oil and gas facilities. The focus is to understand terminology, concepts, typical equipment configurations, and common pitfalls in order to improve communication with electrical and I&C professionals. This course covers similar content to our E3 and IC3 courses, but at a more conceptual level.

Although not required, a computer with Excel is recommended for in-class exercises.

*"The problems and the overall course documentation were both very good."* - Facilities Engineer, United States

*"I certainly feel more equipped to discuss instrumentation and controls than before."* - Participant

#### Target Audience

Process, chemical, and mechanical engineers, (i.e. non-instrumentation and non-electrical disciplines), as well as other technical and non-technical professionals with little or no background in IC&E systems. Electrical and Instrumentation Engineers should consider E3 and IC3 for more in-depth coverage.

#### You Will Learn

- Fundamentals of electricity, such as voltage, current, resistance, power factor, and single/three phase power systems
- Electrical specifications, such as voltage selection, load lists, and power
- How to read one-line diagrams and understand the function of the components of power distribution, including transformers, switchgear, MCCs, VFDs, and power distribution
- The function and considerations of infrastructure components, such as cable, conduit, cable tray, and duct banks
- Awareness of the concepts behind classification of hazardous locations and equipment specifications
- Safety risks and mitigation strategies for power systems, including short circuit and overcurrent protection, ground faults, shock hazards, and arc flash
- Fundamentals of control systems, sensors, controllers, and final elements
- Key requirements for instrument specifications such as accuracy, signal selection, process conditions, material compatibility, installation considerations, capabilities and limits, and relative cost

- Basics of specification of shutdown and control valves
- Control system functions, limitations, and architectures, including PLC, DCS, SIS, RTU, and SCADA; common networking systems, including Ethernet, Modbus and Fieldbus
- Exposure to the typical documentation and drawings necessary for the design, specification, installation, operation and maintenance of electrical, instrumentation and control systems

Course Content

- Fundamentals of electricity
- Power distribution and motor control systems for oil and gas applications
- Emergency power systems
- Hazardous area classification for oil and gas applications
- Electrical safety in industrial facilities
- Control system fundamentals
- Field measurement and control devices
- Programmable electronic systems (PLC, DCS, SIS, SCADA)
- Control system networking
- Drawings and documentation for IE&C projects

Product Details

Categories: [Upstream](#)

Disciplines: [Instrumentation, Controls & Electrical](#)

Levels: [Basic](#)

Product Type: [Course](#)

Formats Available: [In-Classroom](#) [Virtual](#)

Instructors: [Jason Pingenot](#) [Rodney Jacobs](#) [Michael Bayer](#)

In-Classroom Format

14 Oct '24	18 Oct '24	-		Course		In-Classroom (in London)	\$5,385.00
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4 Nov '24	8 Nov '24	-		Course		In-Classroom (in Houston)	\$4,610.00
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Virtual Format

12 Aug '24 23 Aug '24 - | Course | Virtual ( Houston UTC)

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\$3,970.00