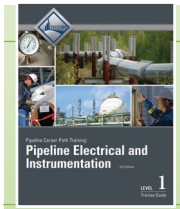
V1 PIPELINE ELECTRICAL AND INSTRUMENTATION



VOLUME 1

Curriculum Notes

- Volume 1: 240 Hours
- Volume 2: 240 Hours
- To Be Released: 2017, Third Edition
- Instructor's Package includes access to lesson plans, PowerPoints®, and performance exams available from the Instructor Resource Center at www.nccerirc.com.

PAPERBACK	ISBN
VOLUME 1	
Trainee Guide: $100	**978-0-13-480564-1**
Instructor's Guide: $100	**978-0-13-479537-9**
VOLUME 2	
Trainee Guide: $100	**978-0-13-480565-8**
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MODULES (Volume 1)

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following pricing information is for ordering individual modules which can be purchased through the online bookstore at www.nccer.org/bookstore.

Pipeline E&I Safety *(15 Hours)*
Trainee $20 **ISBN 978-0-13-038376-1**
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(Module ID 64102-02) Describes the types and uses of personal protective equipment and covers hazard communications. Covers lockout/tagout and MSDS requirements; safety rules, regulations, and tools; and worksite hazards.

Trade Math *(40 Hours)*
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Tools of the Trade *(15 Hours)*
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Instructor $20 **ISBN 978-0-13-038388-4**
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Pipeline E&I Drawings *(30 Hours)*
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(Module ID 64107-02) Identifies drawing classifications and written specifications. Describes the uses of electrical drawings and piping and instrumentation drawings. Also covers special drawings and documentation as well as pipeline maps and alignment sheets.

Understanding the *National Electrical Code®* *(7.5 Hours)*
Trainee $20 **ISBN 978-0-13-038383-9**
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(Module ID 64108-02) Provides a map for using the NEC®. Introduces the layout and the types of information found within the code book. Presents an easy-to-follow procedure for finding information in the NEC®.

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Instructor $20 **ISBN 978-0-13-038392-1**
(Module ID 64109-02) Introduces hardware and systems used to mount and support boxes, receptacles, and other electrical components. Covers types of anchors and supports, their applications, and their safe installation.

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Instructor $20 **ISBN 978-0-13-038404-1**
(Module ID 64201-02) Explains Class I, II, III, and IV pipeline areas. Describes intrinsically safe devices and systems and their ratings. Also covers allowable conduits and fittings, and explosion-proof enclosures. Explains safe work practices in classified areas, including barriers, PPE, monitoring requirements, and gas detectors.

Use of Meters and Test Equipment *(15 Hours)*
Trainee $20 **ISBN 978-0-13-038394-5**
Instructor $20 **ISBN 978-0-13-038405-8**
(Module ID 64202-02) Explains general, personal, and test equipment for E&I safety. Covers measuring current, voltage, and resistance and the types of meters used. Includes specialty instruments such as calibrators, simulators, and gauges. Includes sections on oscilloscope operation, waveform characteristics, and measurement techniques.

Grounding *(30 Hours)*
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Instructor $20 **ISBN 978-0-13-038406-5**
(Module ID 64203-02) Explains grounding basics, system types, NEC® requirements, equipment grounding, and how to bond service equipment. Includes discussion of effective grounding paths, conductors, separately derived systems, grounding at more than one building, and systems over 1,000 volts. Describes how to test grounding and measure earth resistance, three-point testing, and tank grounding.

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Supervisory Control Systems *(15 Hours)*
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Instructor $20 **ISBN 978-0-13-038409-6**
(Module ID 64205-02) Explains pipeline supervisory control systems, PLCs, HMIs, and RTUs. Describes data highways and protocols, including data transfer methods, and SCADA-related communications, including transfer media, wireless radios, and Ethernet, and transmission and interface methods.

Transformers *(25 Hours)*
Trainee $20 **ISBN 978-0-13-103140-1**
Instructor $20 **ISBN 978-0-13-103148-7**
(Module ID 64301-02) Describes power systems and explains transformer construction, taps, installation requirements, and connections. Describes power distribution, instruments, control, and isolation transformer types. Also covers transformer maintenance and testing.

Switchgear and MCCs *(25 Hours)*
Trainee $20 **ISBN 978-0-13-103141-8**
Instructor $20 **ISBN 978-0-13-103149-4**
(Module ID 64302-02) Explains power factor and medium versus low-voltage cable and MCCs. Describes types of switchgear and cables, feeders, bussing, and bracing. Includes testing and maintenance on switchgear and MCCs and associated components.

Low-Voltage and Standby Power *(25 Hours)*
Trainee $20 **ISBN 978-0-13-103142-5**
Instructor $20 **ISBN 978-0-13-103150-0**
(Module ID 64303-02) Explains pipeline system standby generators, batteries, chargers, inverters, converters, and rotary and static UPSs. Also addresses the maintenance and testing of each.

Power Quality *(25 Hours)*
Trainee $20 **ISBN 978-0-13-103143-2**
Instructor $20 **ISBN 978-0-13-103152-4**
(Module ID 64304-02) Explains power quality and types of defects, power systems, protection, and conditioning equipment. Discusses types of electrical noise and related problems, and possible solutions. Describes static electricity and its effect, system verification testing, and equipment maintenance.

Prime Movers *(32.5 Hours)*
Trainee $20 **ISBN 978-0-13-103145-6**
Instructor $20 **ISBN 978-0-13-103153-1**
(Module ID 64305-02) Describes various electric motors and drives and their components. Discusses their maintenance and testing. Explains engine types, cooling and lubrication systems, turbine operation, fuel sources, and controls.

Facility Auxiliary Systems *(22.5 Hours)*
Trainee $20 **ISBN 978-0-13-103146-3**
Instructor $20 **ISBN 978-0-13-103154-8**
(Module ID 64306-02)Includes information on pipeline facility buildings and related systems, including fire, security, vapor recovery, injection, water treatment, cathodic protection, and blending systems.

SCADA *(30 Hours)*
Trainee $20 **ISBN 978-0-13-103147-0**
Instructor $20 **ISBN 978-0-13-103155-5**
(Module ID 64307-02) Explains pipeline operations systems, including control, communications, SCADA, and PLCs. Explains redundant systems and control system troubleshooting.