

BASICS OF INDUSTRIAL ELECTRICITY

CLASS FORMAT:

Lab + classroom

The participant is able to “learn-by-doing” in the course; this knowledge can be transferred to the workplace.

STANDARD CLASS SIZE:

NTT recommends a course size of 15 participants for the best results.

NTT PROVIDES:

- 3 days (24 contact hours) of on-site instruction
- Textbooks and lab manuals
- Classroom consumables
- Completion certificates
- Shipping and instructor travel logistics

CLIENT PROVIDES:

- The classroom, with easy access, of 750 square feet or greater
- Projection screen, white board and/or flip chart(s).
- A dock facility or forklift
- A pallet jack to move the crates around after they have been unloaded may also be needed
- The equipment needs to be relocated to the training room for the NTT instructor to test and set up prior to the course start

SHIPPING:

1 Crate at 58" x 47" x 62" (1,100 lbs.)

Gain a basic understanding of electricity generation and delivery. Learn how electricity is applied to transformers, motors and common electrical devices; how and where these components work and their applications. You will also learn and practice safe methods and how to choose the proper instruments and tools to measure and comprehend the characteristics and properties of electrical signals in terms of voltage, current and impedance (resistance).

Gain invaluable experience in using and understanding electricity and its function in an electrical circuit. The course covers all aspects of electricity, including ohm's law, terminology, common circuits, test equipment, safety, generators, motors and relays. Theory and explanations support numerous practical hands-on exercises, and can apply to real world situations.

The course content is for apprentices, machine operators, mechanics, technicians, supervisors and other trades people. Its benefit is being able to find, understand and fix electrical problems more easily, thereby reducing downtime.

COURSE AGENDA

BASIC ELECTRICITY

- Current, voltage, and resistance
- Ohm's Law and calculations
- Series-parallel circuits
- Kirchhoff's Laws and corollaries

BASICS OF MULTIMETERS

- Analog and digital multimeters
- Solenoid meters
- Accessories

ELECTRICAL SAFETY

- Basic safety guidelines
- Lockout/tagout
- Test safety equipment

COMMON WIRING DEVICES

- Measure voltage receptacles
- Types/grades of current
- Voltage check*
- Using the probe*
- Probing a circuit
- Hot and grounding reversed
- GFCI connections*



*Hands-On Lab Exercises

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COURSE AGENDA, continued

COMMON WIRING DEVICES, CONTINUED

- Hot reversed with neutral and open
- Problem receptacles*
- Switch loops
- Dimmer and double-pole switches
- Installing a switch*
- 4-way switches*
- 3-way switches*
- Installing 3- and 4-way switches*

LIGHTING & HEATING

- Types of lamps
- Preheat, rapid start, and instant start
- Series resistance*
- Parallel resistance*
- Series/parallel resistance*

CONDUCTORS & RACEWAYS

- Solid and stranded
- Cables and conduit

WIRES

- Splitbolts and terminal blocks
- Conductor fill and in parallel
- Low-voltage circuits

ELECTRICIANS' TOOLS & TEST EQUIPMENT

- Cutting tools
- Measuring devices
- Tools for conduit
- Phase-rotation meter
- The megohmmeter
- Voltage and continuity testers

GENERATORS & TRANSFORMERS

- DC power sources and voltmeter
- Measuring DC volts*
- Series circuit*
- Parallel circuit*
- AC generators
- Generators and sine voltage
- Current lags/leads wave
- Transformers
- Transformer voltages*
- Wyes and deltas*
- Measuring a wye or connectors

SOLID-STATE DEVICES

- Resistor color codes
- Resistor board*
- Diodes and continuity*
- Rectifiers
- Capacitor sine waves
- Capacitor check*
- Solid-State switches
- Checking a solid-state switch*

PROTECTIVE DEVICES

- Overcurrent
- Circuit breaker
- Overload relays
- Testing fuses*
- Ground-fault selectivity
- Coordination and sensors/lights

ELECTRICAL DRAWING AND SYMBOLS

- Drawing symbols
- Blueprints
- One-line drawings
- NEMA symbols
- Schematics
- Ladder diagrams
- Physical layout

INDUSTRIAL WIRING DEVICES

RELAYS

MOTORS

- Single-phase, three-phase and DC
- Connection diagrams
- Motor construction
- Theory of operation

BASICS OF INDUSTRIAL ELECTRICITY HANDS-ON LAB EXERCISES

- Basic trainer set up series circuit
- Parallel circuit
- Series-parallel circuits
- DC voltage transformers
- Resistors
- Capacitor
- Rectifiers
- Problem receptacles single-pole switch multiple-way switches