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Pennsylvania College of Technology

Workforce Development & Continuing Education

Basic Industrial Electricity TRS 266

Course Outline

Course Description: Gain a basic understanding of how electricity works in commercial and industrial settings. Starting with easily understood analogies to explain the fundamentals of electricity, participants will then be quickly immersed in practical, real world examples used to illustrate how electricity is distributed and used in their own plants and facilities. Different types of electrical test equipment and how to use this equipment in everyday jobs will be explained. Participants will learn how safety and installation codes pertain to their jobs and how to choose the right materials for the job. Participants are taught how to perform basic electrical repairs and installations. Safety is stressed throughout the course.

Textbook: TBD

Prerequisites: A basic understanding of industrial electricity

Course Length: 40 hours

Course Outline:

- ✚ **Electrical Fundamentals**
 - Production & distribution of electricity
 - DC & AC in plants & facilities
 - Voltage, current & resistance: Ohm's Law
 - Basic electric circuits
 - Series circuits
 - Parallel circuits
 - Series/parallel circuits
 - Power: types & control
 - Single-phase & three-phase systems

- Workplace electrical safety

+ Electrical Test Equipment for Everyday Use

- Multimeters
- Voltage testers
- Verifying a circuit de-energized
- 3 modes of failure: opens, shorts, ground faults
- Clamp-on ammeter
- Megohmmeters
- Meters for special circumstances

+ Understanding Your Building Electrical System

- Reading electrical single-line diagrams
- Major components
- The electrical service
- Main distribution centers
- Transformers
- Switchgear & circuit breakers
- Overcurrent protective devices
- Feeders
- Disconnects
- Motors
- Panel boards & branch circuits
- Lighting circuits
- Electrical floor plans & facility wiring

+ Electrical Installation Codes

- Purpose & overview
- Important definitions & terminology
- Overview of installation requirements
- “Qualified persons”

+ Wire Selection

- Conductor types & materials
- Selection of wire insulation
- Sizing the wire for the job

+ Installing Wire (Conductors)

- Raceways
- Cable trays
- Conduits
- Fittings & boxes

+ Installing & Wiring Equipment

- Wire nuts, terminals & crimpers
- Switches & receptacles
- Fluorescent ballasts

- Motors
- Temporary wiring

Electrical Maintenance Activities

- Why perform electrical maintenance
- Overview of an electrical maintenance program
- Building your own walk-through inspection checklist
- Performing checks as part of an assured equipment grounding program
- Use & operation of GFCI's
- Types of electrical maintenance
- Special precautions