

ATPL-2350: ELECTRICITY FOR PLUMBERS

Cuyahoga Community College

Viewing: ATPL-2350 : Electricity for Plumbers

Board of Trustees:

2012-06-28

Academic Term:

Spring 2019

Subject Code

ATPL - Applied Ind Tech - Plumbers

Course Number:

2350

Title:

Electricity for Plumbers

Catalog Description:

Fundamentals of electricity for the plumbing trade. Covers safety, transformers, direct and alternating current, and basic controls. Discussion of motors and troubleshooting exercises.

Credit Hour(s):

2

Lecture Hour(s):

2

Requisites

Prerequisite and Corequisite

Departmental approval: admission to Plumbers' apprenticeship program.

Outcomes

Course Outcome(s):

1. Identify the safety precautions related to electrical safety and discuss how they relate to mechanical service.

Course Outcome(s):

2. Explain the fundamentals of electrical circuits including basic principles, types and different currents.

Course Outcome(s):

3. Identify the different types of transformers, their function and applications and explain the purpose of different transformer coils that are used.

Course Outcome(s):

4. Classify the different currents as either alternating or direct and discuss why.

Course Outcome(s):

5. Identify different motors their uses, operating principles and various controls.

Methods of Evaluation:

1. Homework
2. Quizzes
3. Tests

Course Content Outline:

1. Safety
 - a. Occupational Safety and Health Administration (OSHA)
 - i. Personal protective equipment
 - ii. Substandard 70-E
 - iii. National Fire Protection Agency
 - b. Injuries
 - i. Burns
 - ii. Electrical shock
 - c. Grounding
 - i. Definition
 - ii. Purpose
 - iii. Tools
 - iv. Equipment
 - d. Service
2. Electrical circuits
 - a. Atomic theory
 - i. Atom structure
 - ii. Electron
 - b. Potential, current and resistance
 - i. Voltage
 - ii. Amperage
 - iii. Loads
 - c. Ohm's Law
 - i. Mathematical calculations
 - ii. Circuit solving
 - iii. Probability versus actual
 - d. Conduction and wiring methods
3. Transformers
 - a. Types
 - i. Oil
 - ii. Dry
 - b. Function
 - i. Voltage
 1. Step down
 2. Step up
 - ii. Isolation
 - c. Operation and use
 - i. Residential
 1. Circuit controls
 2. Safety circuits
 - ii. Commercial
 1. Power supply
 2. Safety and controls
 - iii. Industrial
 - d. Operation
 - i. Windings
 - ii. Wire size
 - e. Mutual induction
 - f. High efficiency
4. Currents
 - a. Alternating
 - i. Sine wave theory
 - ii. Field application
 - b. Direct

- c. Phases
 - i. Single
 - 1. Residential
 - 2. Commercial
 - ii. Three phase
 - d. Sine wave theory
 - i. Peak voltage
 - ii. Applicable voltage
 - iii. Change per second
 - e. Magnetic fields
 - i. Lines of flux
 - ii. Inductance
 - iii. Inductive reactance
 - iv. Lenz Law
5. Motors
- a. Types
 - i. Single phase 110 volts
 - ii. Single phase 220 volts
 - iii. Three phase 220 volts
 - b. Components
 - i. Stator
 - ii. Commutator
 - iii. Brushes
 - iv. Windings
 - c. Motor controls
 - i. Switches
 - ii. Starters
 - iii. Relays
 - d. Trouble shooting
 - i. Open circuit
 - ii. Grounded circuit
 - iii. High voltage draw

Resources

Herman, Stephen. *Standard Textbook of Electricity*. Current. Baytown, Texas Delmar, 2011.

Mazuk, Glen. *Electrical Principles and Practices*. 3rd. American Technical Publishers/Orland Park, IL, 2011.

Miller, Rex. *Industrial Electricity and Motor Controls*. 1st. McGraw-Hill / N.Y.N.Y., 2007.

Herrick, Clyde. *Electrical Wiring: Principles and Practices*. 2nd ed. Maintenance Resources/Rerra Haute, In, 2008.

Resources Other

1. www.allaboutcircuits.com (<http://www.allaboutcircuits.com>)
2. www.openbookproject.net/ (<http://www.openbookproject.net/>)
3. www.lightandmatter.com (<http://www.lightandmatter.com>)

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