

COCONINO COMMUNITY COLLEGE
COURSE OUTLINE

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Status: Permanent

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A. Identification:

1. Subject Area: Construction Technology Management
2. Course Number: CTM 150
3. Course Title: Basic Electrical Theory
4. Credit Hours: 3
5. Catalog Description: Introduction to electrical theory, trade math, Electrical theory & math. Electrical safety and first aid, Introduction to DC Theory & Batteries , AC theory, Induction , Ohm's Law , Series & parallel Circuit diagram & Schematics, Wire Gauges, Ampacity & Loads, Grounding & Bonding. Prerequisite: *MAT 121 or *MAT 122. May be taken for S/U credit with instructor approval. Three lecture.

B. Course Goals: Introduce the student to DC theory and the fundamentals of electricity including Ohm's Law as it applies to the methods, procedures, operations used in electrical theory, electrical safety, Bonding symbols & Schematic drawings, proper circuit layouts used in electrical testing and electrical blueprint reading.

C. Course Outcomes: Upon completion of course, student will

1. demonstrate the proper use of hand and power tools;
2. identify the differences in Electrical trades & its history;
3. identify Electrical Inventors, their history & inventions;
4. explain magnetism;
5. explain the fundamentals of electricity;
6. explain fundamental electrical terminology;
7. calculate Ohm's Law & other electrical laws;
8. identify specific electrical symbols, circuits, diagrams and devices;
9. identify the use of Series & Parallel Circuits;
10. solve calculations for specific electrical circuits;
11. determine proper circuit layout and solve series & parallel circuits problems;
12. explain the purpose of various types of switches;
13. explain Electrical shock & electrical shock hazards;
14. demonstrate Cardiopulmonary Resuscitation (CPR), choking respiratory techniques;
15. explain Bonding & Grounding;
16. identify specific types of wire & wire sizes; calculate wire size for ampacity;
17. identify Electrical Overload Hazards & Over Current Protection;
18. demonstrate proper use of electrical meters and their differences;
19. identify hazardous materials and interpret Materials Safety Data and Sheet (MSDS);
20. state the jurisdictions that govern electrical work.

D. Assessment of Course Outcomes will include:

1. department & faculty level review of student results from a variety of testing instruments;
2. and department level review of class integration with electrical programs current a future for student preparedness.

E. Course Content will include:

1. Hand and Power Tools for electricians
2. Electrical History & Inventions
3. Electrical Inventors
4. Fundamentals of Magnetism
5. Electrical Fundamentals
6. Fundamental Electrical Terms, Signs & symbols,
7. Ohm's Law & calculations
8. Read Electrical Circuit diagrams
9. Series & Parallel Circuits
10. Series & Parallel calculations
11. Electrical Circuit calculations
12. Wire Types, Calculate wire size, Calculate Power and Roots
13. Electrical Shock Hazard Identification
14. CPR Choking and Respiratory
15. Bonding & Grounding Theory & Circuits & Calculations
16. Current Carrying Capacity of Wire Sizes
17. Circuit Wiring and Loading –
18. Electrical Measuring Devices, Tools & Meters
19. Hazardous Materials, Material Safety Data Sheets
20. Governing Entities and Electrical Fundamentals: National Electrical Code (NEC), American National Standards (ANSI), Underwriters Laboratories (UL), National Electrical Manufacturers Association (NEMA)

*Course has additional pre or co requisite(s)