ELECTRICAL THEORY IN CONSTRUCTION
Course Syllabus

Course Number: CNST-0204
OCAS Code: None
Course Length: 120 Hours
Career Cluster: Architecture and Construction
Career Pathway: Construction
Career Major(s): Commercial Electrician’s Assistant, Electrical Assistant - Entry Level

Pre-requisite(s):

Course Description: This course covers Ohms law and the concepts of electrical theory necessary to install, maintain, and troubleshoot electrical circuits.

Textbooks: Amatrol Electrical Training Systems

Course Objectives: A. Demonstrate Knowledge of Basic Electrical Circuits.

1. Define electricity and explain how it flows.¹
2. List and describe the two theories concerning current flow.¹
3. List, describe, and name one source of the two types of electrical current.¹
4. List two basic electrical safety rules and explain why they are important.¹
5. Describe the function of an electrical circuit and name four applications.¹
6. List the four basic components of an electrical circuit and describe their function.¹
7. Connect and operate a power supply.¹
8. Describe the purpose and operation of a circuit tester.¹
9. Use an AC tester to check wall outlet output.¹
10. Describe what an electrical schematic is and why it is used.¹
11. Describe the operation of a switch in a circuit.¹
12. List and describe the operation of the two main components of an electrical switch.¹
13. List and describe the function of the two types of switch contacts.¹
14. Name two types of switch operators and describe their function.¹
15. List three types of manual switch operators.¹
16. Describe the operation, function, and give the schematic symbol of a knife switch.¹
17. Connect and operate an electrical circuit using a knife switch.¹
18. Describe the operation, function, and give the schematic symbol of a pushbutton switch.¹
19. Connect and operate a circuit that uses a pushbutton switch.¹
20. Describe the operation, function, and give the schematic symbol of a selector switch.¹
21. Connect and operate a circuit that uses a selector switch.¹
22. List five types of electrical output devices.¹
23. Describe the operation, function, and give the schematic symbol of a lamp.¹
24. Describe the operation, function, and give the schematic symbol of a resistor.¹
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25. Connect and operate an electrical circuit with a resistor.¹
26. Describe the operation, function, and give the schematic symbol of a buzzer.¹
27. Connect and operate an electrical circuit with a pushbutton switch and a buzzer.¹
28. Describe the operation, function, and give the schematic symbol of a solenoid.¹
29. Connect and operate an electrical circuit with a solenoid.¹
30. Describe the operation, function, and give the schematic symbol of a motor.¹
31. Connect and operate an electrical circuit with a motor.¹

B. Understand Electrical Theory.
   1. Recognize what atoms are and how they are constructed.²
   2. Define voltage and identify the ways in which it can be produced.²
   3. Explain the difference between conductors and insulators.²
   4. Define the units of measurement that are used to measure the properties of electricity.²
   5. Explain how voltage, current, and resistance are related to each other.²
   6. Using the formula for Ohm’s Law, calculate an unknown value.²
   7. Explain the different types of meters used to measure voltage, current, and resistance.²
   8. Using the power formula, calculate the amount of power used by a circuit.²

¹ Amatrol objective
² NCCER objective

Teaching Methods: The class will primarily be taught by the lecture and demonstration method and supported by various media materials to address various learning styles. There will be question and answer sessions over material covered in lecture and media presentations. Supervised lab time is provided for students to complete required projects.

Grading Procedures: 1. Students are graded on theory and shop practice and performance.
   2. Each course must be passed with seventy (70%) percent or better.
   3. Grading scale: A=90-100%, B=80-89%, C=70-79%, D=60-69%, F=50-59%.

Description of Classroom, Laboratories, and Equipment: Tulsa Technology Center campuses are owned and operated by Tulsa Technology Center School District No. 18. All programs provide students the opportunity to work with professionally certified instructors in modern, well-equipped facilities.

Available Certifications/College Credit: The student may be eligible to take state, national or industry exam after completion of the program. College credit may be issued from Oklahoma State University-Okmulgee or Tulsa Community College. See program counselor for additional information.

College Credit Eligibility: The student must maintain a grade point average of 2.0 or better.