Direct Current

This one-credit course is designed to provide students with the fundamental knowledge and skills for this area of the electrical industry. Emphasis is placed on job safety, sources, terminology and symbols, components of a basic circuit, electrical quantities and measurements, characteristics of resistors, Ohm’s law in direct current circuits, circuit construction, and troubleshooting. Upon successful completion of this course, students perform basic tasks related to the electrical industry.

Career and technical student organizations are integral, cocurricular components of each career and technical education course. These organizations serve as a means to enhance classroom instruction while helping students develop leadership abilities, expand workplace-readiness skills, and broaden opportunities for personal and professional growth.

Sources

Students will:

1. Identify structure and characteristics of the atom.
2. Explain the relationship of the atom to an electrical charge, including electrostatic field and law of charges.
3. Identify sources of electricity, including chemical, mechanical, and solar.
   Examples: chemical—battery
              mechanical—generator

Terminology and Symbols

4. Explain electrical terms, including direct current (DC), voltage, resistance, power, conductors, and insulators.
5. Interpret electrical symbols.
   Examples: unit symbols, schematic symbols

Components of a Basic Circuit

6. Explain components of a basic circuit, including source, load, and conductor.

Electrical Quantities and Measurements

7. Explain electrical quantities and units of measure, including voltage, current, resistance, and power.
8. Determine electrical quantities of volts, ohms, and amperes utilizing appropriate test equipment.
**Characteristics of Resistors**

9. Identify different types of resistors, including fixed and variable resistors.

10. Determine resistance values using the standard resistor color code.

11. Determine electrical and physical characteristics of resistors.
   
   Examples: resistance, power rating, wattage

**Ohm’s Law in Direct Current Circuits**

12. Solve problems in electrical series, parallel, and combination circuits using Ohm’s law to determine voltage, current, resistance, and power.

**Circuit Construction**

13. Demonstrate the fabrication of specified DC circuits, including the use of soldering, breadboards, and wiring techniques.

**Troubleshooting**

14. Demonstrate troubleshooting techniques for circuits, including opens, shorts, and grounds.