

Course Objectives/Course Outline
Spokane Community College

Course Title: Basic Electrical Theory

Prefix and Course Number: HEQ 111

Course Learning Outcomes:

By the end of this course, a student should be able to:

- describe basic electrical theory and its application to heavy equipment components
- identify the types and purposes of electrical testing equipment
- explain the functions of low voltage DC generators and AC generators (alternators)
- identify the components of starting systems
- identify the components of ignition systems
- interpret wiring and circuitry diagrams

Course Outline

- I. Basic Electrical Theory
 - A. Electrical Terminology
 - B. Electron Theory
 - C. Ohm's Law
 - D. Circuit Types and Symbols
- II. Magnetism
 - A. Magnetic Materials
 - B. Permanent Magnets
 - C. Electromagnetism
- III. Test Meters
 - A. Analog/Digital Meters
 - B. Inductive Meters
 - C. Amp, Volt, and Ohmmeters
 - D. Use of Test Equipment
- IV. Batteries
 - A. Operation and Construction
 - B. Safety Precautions
 - C. Applications
 - D. Ratings
 - E. Testing Procedures
- V. Charging Systems
 - A. DC Generators
 - B. AC Generators (Alternators)
 - C. Voltage Regulators
 - D. Dual Voltage Systems
- VI. Starting Systems
 - A. Starter Motors
 - B. Solenoids
 - C. Relays
 - D. Switches
 - E. Dual Voltage Systems
 - F. Wiring and Circuitry

VII. Ignition Systems

- A. Conventional Distributor Systems
- B. Electronic Distributor Systems

VIII. Safety

- A. Shop Safety and Awareness
- B. Federal and State Regulations
- C. Shop Tool Use and Safety