



South Central College

AST 1212 Basic Electrical

Common Course Outline

Course Information

Description	This course covers the fundamentals of electricity. The battery, DC electrical circuits, circuit components, wiring diagrams, digital multimeter use, Ohm's law, Watt's law, and circuit testing will be presented in this course. (Prerequisite: Admission to the Automotive Service program)
Total Credits	2
Total Hours	48

Types of Instruction

Instruction Type	Credits/Hours
Lecture	1/16
Lab	1/32

Pre/Corequisites

Prerequisite Admission to the Automotive Service program

Institutional Core Competencies

Critical and Creative Thinking - Students will be able to demonstrate purposeful thinking with the goal of using a creative process for developing and building upon ideas and/or the goal of using a critical process for the analyzing and evaluating of ideas.

Course Competencies

1. Exhibit professionalism, demonstrate proper shop safety procedures, and reference service information

Learning Objectives

Demonstrate professional conduct and accept responsibility for the successful and timely completion of assignments

Identify and explain safety considerations, demonstrate proper safety procedures

Research applicable vehicle service information - such as electrical/electronic system operation, vehicle service history, service precautions, and technical service bulletins

2. Explain principles of electricity

Learning Objectives

Describe types of circuits and circuit fundamentals

Describe voltage, resistance, current, and wattage

Explain the principle of magnetism

3. Identify and explain circuits and components found on a wiring diagram

Learning Objectives

Identify electrical symbols, components, and circuit protection devices
Identify component location on wiring diagrams
Interpret and follow wiring diagrams
Demonstrate the effective use of wiring diagrams during circuit diagnosis

4. Describe and use Ohm's law and Watt's law

Learning Objectives

Using Ohm's law, explain the effect of voltage, resistance, and current on a circuit
Calculate voltage, voltage drop, resistance, current, and wattage in a series, parallel, and series parallel circuit

5. Demonstrate proper digital multimeter (DMM) use during electrical system diagnosis

Learning Objectives

Measure voltage and voltage drop in a series circuit - determine necessary action
Measure voltage and voltage drop in a parallel and series parallel circuit - determine necessary action
Check for continuity and measure resistance in circuits and components using an ohmmeter - determine necessary action
Measure current flow through circuits and components using an ammeter - determine necessary action

6. Test and diagnose various electrical system faults

Learning Objectives

Identify and interpret electrical system concerns - determine necessary action
Use wiring diagrams during diagnosis of electrical circuit problems
Check circuits with a test light and a fused jumper wire - determine necessary action
Identify, inspect, and test fusible links, circuit breakers, and fuses - determine necessary action
Inspect and test switches, connectors, relays and wires - determine necessary action
Diagnose short circuit, open circuit, and high resistance circuit problems - determine necessary action
Measure and diagnose the cause of an excessive parasitic draw - determine necessary action

7. Perform wire and terminal repair

Learning Objectives

Identify wire type and gauge
Perform solder repair of electrical wiring
Repair wiring harness, replace terminals and connectors