South Central College

AST 1212 Basic Electrical

Course Outcome Summary

Course Information

Description
This course covers the fundamentals of electricity and electronics. Electrical circuits and components, magnetism, resistance, current flow, capacitance, instruments, diodes and solid-state devices will be presented in a manner which relates the subject to the occupation.

(1 lecture credit, 1 lab credit)

Total Credits 2
Total Hours 48

Types of Instruction

Instruction Type Credits/Hours
Lecture
Lab

Pre/Corequisites

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, act responsibly 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 circuit basics
Describe voltage, resistance, current and wattage
Explain the principle of magnetism

3. **Identify and explain different types of 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**

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

5. **Demonstrate proper digital multimeter (DMM) operation 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/electronic 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
   Find shorts, grounds, opens and high resistance problems in electrical circuits - determine necessary action
   Measure and diagnose the cause of an abnormal parasitic draw - determine necessary action
   Check electrical/electronic circuit waveforms; interpret readings and determine needed repairs.

7. **Describe and test electrical and solid state components**

   Learning Objectives
   Identify, explain and test relays
   Identify, explain and test diodes
   Identify and explain transistor operation
   Describe electrical/electronic controls and system operation

8. **Perform wire and terminal repair**

   Learning Objectives
   Identify wire type and gauge
   Perform solder repair of electrical wiring
   Repair wire harnesses including CAN/BUS; Remove and replace terminal end from connector; replace connectors and terminal ends.

**SCC Accessibility Statement**

South Central College strives to make all learning experiences as accessible as possible. If you have a disability and need accommodations for access to this class, contact the Academic Support Center to request and discuss accommodations. North Mankato: Room B-132, (507) 389-7222; Faribault: Room A-116, (507) 332-7222.
Additional information and forms can be found at:  www.southcentral.edu/disability

This material can be made available in alternative formats by contacting the Academic Support Center at 507-389-7222.