



South Central College

AST 1222 Advanced Electrical

Course Outcome Summary

Course Information

Description	This course covers the operation and diagnosis of lighting systems, gauges and warning systems, horns, windshield wiper and washer systems, power locks, power windows and seats, and other automotive electrical systems. Prior knowledge gained by the successful completion of AST1212 is required for student success in this course. (1 lecture credit, 1 lab credit)
Total Credits	2
Total Hours	48

Types of Instruction

Instruction Type	Credits/Hours
Lecture	
Lab	

Pre/Corequisites

Admission into 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 and demonstrate proper shop safety procedures

Learning Objectives

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

Identify and explain safety considerations and follow all safety procedures

Identify system voltage and safety precautions associated with high intensity discharge headlights.

2. Explain the operation of various automotive electrical systems

Learning Objectives

Describe the operation of the horn circuit
Explain the operation of various interior and exterior lighting systems
Describe the operation of the turn signal and hazard light systems
Explain the operation of various warning light circuits
Describe the operation of the fuel, oil pressure, coolant temperature and voltmeter gauges
Describe the function and operation of the various gauge sending units or sensors
Explain the purpose of the instrument cluster voltage regulator
Explain the operation of two speed, three speed and intermittent windshield wiper systems and also the operation of the washer system
Describe the operation and methods used to control the blower fan motor speeds
Explain the principles of operation for the power seats, power windows and locks
Describe the operation of electric and electro/mechanical cruise control systems
Describe the operation of keyless entry/remote-start systems.

3. Demonstrate accurate diagnosis of various electrical system concerns

Learning Objectives

Diagnose the cause of brighter than normal, intermittently dim and no light operation - determine necessary action
Inspect and diagnose incorrect turn signal, hazard lights, stop lights and tail light operation - determine necessary action
Inspect and test sensors, connectors and wires of electronic instrument circuits and printed circuit boards of gauge circuits- determine necessary action
Inspect and test gauges and gauge sending units for abnormal gauge readings; determine necessary action. - determine necessary action
Diagnose the cause of incorrect horn operation, warning devices and other driver information systems - perform necessary action
Diagnose incorrect operation of windshield wipers, wiper speed control and park problems - perform necessary action
Diagnose incorrect operation of the windshield washer system - perform necessary action
Troubleshoot the incorrect operation of the blower motor - determine necessary action
Inspect and test problems associated with motor driven accessory circuits - determine necessary action
Troubleshoot incorrect electric lock, remote keyless entry, power windows and power seat operation - determine necessary action
Diagnose incorrect operation of the cruise control system, test speed sensor for opens and shorts -determine necessary action
Diagnose incorrect heated glass and mirror operation - determine necessary action
Inspect and test for causes of radio static, weak, intermittent or no radio reception - determine necessary action
Inspect and test solid state control devices - determine necessary action
Diagnose supplemental restraint system (SRS) concerns; determine necessary action.

4. Perform accurate electrical system repairs

Learning Objectives

Inspect, replace and aim headlights
Replace wiper blades, motor and control switch
Perform other electrical system repairs as required
Disarm and enable the airbag system for vehicle service.
Remove and reinstall door panel.

5. Identify hybrid vehicle service procedures

Learning Objectives

Identify location of hybrid vehicle high voltage circuit disconnect (service plug) location and safety procedures.
Identify high voltage circuits of electric or hybrid electric vehicle and related safety precautions.
Identify hybrid vehicle auxiliary (12v) battery service, repair and test procedures.

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.