MONROE COUNTY
COMMUNITY COLLEGE

Course Outcome Summary

Required Program Core Course

AST 102 Auto Electrical/Electronic I

Course Information

Division	ASET
Contact Hours	75
Theory	45
Lab Hours	30
Total Credits	4

Prerequisites – RDG090

Course Description

This course focuses on introducing the student to automotive electrical/electronic systems which includes basic theories, electrical/electronic components, wiring and circuit diagrams, circuit protection, switches, relays, solenoids and automotive battery fundamentals. This course also focuses on the use of test equipment such as digital multimeters, test lights, jumper wires and logic probes used to diagnose basic electrical/electronic faults.

This course is a required core course for students pursuing a (n) AAS or certificate in Automotive Technologies

Program Outcomes Addressed by this Course:

Upon successful completion of this course, students should be able to meet the program outcomes listed below:

A. Demonstrate the correct method of utilizing automotive service tools and equipment
B. Identify all related system diagnostic/repair information within automotive service information
C. Employ safe and professional work habits while conducting typical automotive service procedures.
D. Explain how the various systems of an automobile work
E. Demonstrate correct service procedures in the various automotive systems
F. Test and diagnose the proper operation of the various automotive systems

Course Outcomes

In order to evidence success in this course, the students will be able to:

1. **Demonstrate electrical system operation, diagnosis, and repair procedures utilized in the automotive industry.**
   This outcome is relevant to program outcomes: (A) , (B),(C),(D), (E) and (F)

   a) Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins.

   b) Demonstrate knowledge of electrical/electronic series, parallel, and series-parallel circuits using principles of electricity (Ohm's Law).

   c) Demonstrate proper use of a digital multimeter (DMM) when measuring source voltage, voltage drop (including grounds), current flow and resistance.

   d) Demonstrate knowledge of the causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits.

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e) Check operation of electrical circuits with a test light.
f) Check operation of electrical circuits with fused jumper wires.
g) Use wiring diagrams during the diagnosis (troubleshooting) of electrical/electronic circuit problems.
h) Diagnose the cause(s) of excessive key-off battery drain (parasitic draw); determine necessary action.
i) Inspect and test fusible links, circuit breakers, and fuses; determine necessary action.
j) Inspect and test switches, connectors, relays, solenoid solid state devices, and wires of electrical/electronic circuits; determine necessary action.
k) Replace electrical connectors and terminal ends.
l) Repair wiring harness.
m) Perform solder repair of electrical wiring.
n) Check electrical/electronic circuit waveforms; interpret readings and determine needed repairs.
o) Repair CAN/BUS wiring harness.

2. Understand and demonstrate battery operation, diagnosis and service

This outcome is relevant to program outcomes: (A) , (B),(C),(D), (E) and (F)

a) Perform battery state-of-charge test; determine necessary action.
b) Confirm proper battery capacity for vehicle application; perform battery capacity test; determine necessary action.
c) Maintain or restore electronic memory functions.
d) Inspect and clean battery; fill battery cells; check battery cables, connectors, clamps, and hold-downs.
e) Perform slow/fast battery charge according to manufacturer's recommendations.
f) Jump-start vehicle using jumper cables and a booster battery or an auxiliary power supply.
g) Identify high-voltage circuits of electric or hybrid electric vehicle and related safety precautions.
h) Identify electronic modules, security systems, radios, and other accessories that require reinitialization or code entry after reconnecting vehicle battery.
i) Identify hybrid vehicle auxiliary (12v) battery service, repair, and test procedures.

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By: Ross Oskui