SOUTHEAST COMMUNITY COLLEGE
TRANSPORTATION OCCUPATIONS
AUTOMOTIVE SERVICE EDUCATIONAL PROGRAM (ASEP)
COURSE SYLLABUS
January 2, 2020
Syllabus Statements

I. CATALOG DESCRIPTION

Course Number: ASEP1161
Course Title: GM Electrical Systems I & HVAC
Prerequisite: None

Catalog Description: This course covers operating principles, diagnosis, service and repair of GM electrical systems. Study of theory, operation, testing, and service of electrical circuits, wires, terminals, and power sources. Study of theory, operation, testing, and service of batteries, starting and charging systems. Study of basic GM scan tool operation. Study of GM Heating, Ventilation, and Air-Conditioning Systems

Credit Hours: 6.0
Class Hours: 30
Lab Hours: 180
Total Contact Hours: 210

II. COURSE OBJECTIVES: *Course will:*

- **A.** Introduce and identify fundamental principles of electricity.
- **B.** Discuss theory of electrical circuits and Ohm's Law.
- **C.** Introduce and identify Series, Parallel, and Series-Parallel Circuits.
- **D.** Discuss theory, operation, and diagnosis using Circuit Testers and Digital Meters.
- **E.** Discuss proper applications and procedures for Automotive Wiring and Wire Repair.
- **F.** Discuss theory, operation and diagnosis using Wiring Schematics and Circuit Testing.
- **G.** Discuss theory, operation, diagnosis and service of automotive batteries.
- **H.** Discuss theory, operation, diagnosis and service of automotive cranking systems.
- **I.** Discuss theory, operation, diagnosis and service of automotive charging systems.
- **J.** Discuss theory, operation, diagnosis and service of automotive lighting and signaling circuits.
- **K.** Introduce and identify types of General Motor heating, ventilation and air conditioning systems.
- **L.** Discuss theory, operation, diagnosis and repair of General Motors heating, ventilation and air conditioning systems.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES

A. STUDENT LEARNING OUTCOMES: *Student will be able to:*

1. Perform lab exercises in a safe and workmanlike manner according to General Motor Service Information procedures.
2. Recall theory and diagnostic procedures for electrical fundamentals.
3. Perform electrical circuit measurements in series, parallel, and series-parallel circuits.

4. Properly operate circuit testers and digital multi-meters.
5. Perform automotive wire, terminal, and connector repair according to General Motors published service procedures.
6. Analyze General Motors wiring schematics for content.
7. Perform basic automotive circuit testing using General Motors published service procedures.
8. Recall theory and construction of automotive batteries.
9. Perform battery testing and service procedures according to General Motors service procedures.
10. Recall theory and construction of automotive cranking systems.
11. Perform cranking system diagnosis and service procedures according to General Motors service procedures.
12. Recall theory and construction of automotive charging systems.
13. Perform charging system diagnosis and service procedures according to General Motors service procedures.
14. Perform diagnosis and repair procedures on lighting and signaling circuits.
15. Perform basic scan tool operations using General Motors scan tools and diagnostic interface hardware and software.
16. Recall theory of operation for General Motors air conditioning systems – refrigerant loop.
17. Diagnose General Motors manual and automatic air conditioning systems.
18. Demonstrate the ability to properly recover, recycle and recharge air conditioning systems using GM vehicles and equipment.

B. GENERAL EDUCATION LEARNING OUTCOMES

GELO #3: Critical Thinking and Problem Solving

Outcome:

1. Collect, identify interpret and analyze data.

IV. CONTENT/TOPICAL OUTLINE

A. Electrical fundamentals
B. Electrical circuits and Ohm's Law
C. Series, parallel, and series-parallel circuits
D. Circuit testers and digital meters
E. Automotive wiring and wire repair
F. Wiring schematics and circuit testing
G. Batteries
H. Battery testing and service
I. Cranking system
J. Cranking system diagnosis and service
K. Charging system
L. Charging system diagnosis and service
M. Lighting and signaling circuits
N. Scan tools
O. Heating and air-conditioning principles
P. The refrigeration cycle
Q. Air-conditioning compressors and service
R. Refrigerants and refrigerant oils
S. A/C system components, operation, and service
T. Air management system

U. Cooling system operation and diagnosis
V. Heating system operation and diagnosis
W. Automatic temperature control systems
X. Hybrid and electric vehicle HVAC systems
Y. Refrigerant recovery, recycling, and recharging
Z. A/C system diagnosis and repair

V. INSTRUCTIONAL MATERIALS

The Course Information Document lists the current text(s) required for this class. The list is also available in the campus bookstore. The Course Information Document also lists the tools/equipment or other supplies required for this class.

VI. METHODS OF PRESENTATION/INSTRUCTION

A. Methods of presentation typically include a combination of the following:

1. Lecture
2. Small and large group discussion
3. Video presentation
4. Demonstrations
5. Project boards
6. Handouts
7. Observations
8. Assigned lab projects
9. Online information
10. Field trips

VII. METHODS OF EVALUATION

A. Methods of evaluation typically include a combination of the following:

1. Notebook (if required)
2. Quizzes
3. Tests
4. Lab grades
5. Attendance/class conduct

Letter grades will be based on the SCC Standard Grade Scale Policy. **Note:** See Course Information Document for specific details on how the course grades will be calculated.

VIII. SPECIFIC COURSE REQUIREMENTS

A. Student must:

1. Complete all tests, projects, assignments, and notebook (if required).
2. Must earn a final grade of 70% (2.0) or higher.

B. Attendance:

1. Students must following the Attendance Policy as stated in the college student handbook, automotive lab and classroom policies handbook or Course Information Document.

C. Shop safety rules will be followed.

D. Any additional course requirements as stipulated by the Instructor.