

SOUTHEAST COMMUNITY COLLEGE
TRANSPORTATION OCCUPATIONS
AUTOMOTIVE SERVICE EDUCATIONAL PROGRAM (ASEP)
COURSE SYLLABUS
November 29, 2022

I. CATALOG DESCRIPTION

Course Number: ASEP 2182
Course Title: GM Engine Performance
Prerequisite: ASEP1111, ASEP1116

Catalog Description: This course covers operating principles, diagnosis, service and repair of GM engine performance systems. Study of theory, operation, testing, and service of powertrain electronic circuits, input sensors, output components, and module controls. Study of theory, operation, testing and service of fuel, ignition and engine mechanical condition.

Credit Hours: 6.0
Class Hours: 53
Lab Hours: 113
Total Contact Hours: 166

II. COURSE OBJECTIVES: *Course will:*

- A. Introduce and identify gasoline engine operation, parts, and specifications.
- B. Discuss theory of intake and exhaust systems.
- C. Discuss theory of turbocharging and supercharging.
- D. Introduce and identify engine condition diagnosis procedures and equipment.
- E. Discuss theory of gasoline fuel.
- F. Discuss theory of alternative fuels.
- G. Discuss theory and operation of GM ignition system components.
- H. Discuss diagnosis and service of ignition systems using General Motors service procedures.
- I. Discuss theory of computer and network fundamentals.
- J. Discuss theory, operation and diagnosis of temperature sensors.
- K. Discuss theory, operation and diagnosis of throttle position sensors.
- L. Discuss theory, operation and diagnosis of manifold absolute pressure, barometric, and pressure sensors.
- M. Discuss theory, operation and diagnosis of mass air flow sensors.
- N. Discuss theory, operation and diagnosis of oxygen sensors.
- O. Discuss theory, operation and diagnosis of wide-band oxygen sensors.
- P. Discuss theory, operation and diagnosis of fuel pumps, lines, and filters.
- Q. Discuss theory, operation and diagnosis of fuel-injection components.

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 of gasoline engine operation, parts, and specifications.
3. Recall theory of intake and exhaust systems.
4. Recall theory of turbocharging and supercharging.
5. Perform engine condition diagnosis according to General Motors published service procedures.
6. Analyze General Motors wiring schematics for content.
7. Recall theory of gasoline fuel properties and applications.
8. Recall theory of alternative fuel properties and applications.
9. Recall theory of ignition system components and operation.
10. Perform ignition system diagnostic tests according to General Motors service procedures.
11. Recall theory and perform testing of automotive temperature sensors.
12. Recall theory and perform testing of automotive throttle position sensors.
13. Recall theory and perform testing of automotive MAP and BARO sensors.
14. Recall theory and perform testing of automotive mass air flow sensors.
15. Recall theory and perform testing of automotive oxygen sensors.
16. Recall theory and perform testing of automotive wide-band oxygen sensors.
17. Recall theory and perform testing of automotive of fuel pumps, lines, and filters.
18. Recall theory and perform testing of automotive fuel injection components.

B. GENERAL EDUCATION LEARNING OUTCOMES

**GELO #3: Critical Thinking and Problem Solving
Outcome:**

1. Collect, identify interpret and analyze data.

IV. CONTENT/UNIT OF INSTRUCTION

- A. Gasoline engine operation, parts, and specifications
- B. Intake and exhaust systems
- C. Turbocharging and supercharging
- D. Engine condition diagnosis
- E. Gasoline
- F. Alternative fuels
- G. Ignition system components and operation
- H. Ignition system diagnosis and service
- I. Computer and network fundamentals
- J. Temperature sensors
- K. Throttle Position (TP) sensors
- L. MAP/BARO and pressure sensors
- M. Mass air flow sensors
- N. Oxygen sensors
- O. Wide-band oxygen sensors
- P. Fuel pumps, lines, and filters
- Q. Fuel-injection components and operation

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. Earn a final grade of 70% (2.0) or higher.

B. Attendance:

1. Students must follow 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.