

**SOUTHEAST COMMUNITY COLLEGE**  
**TRANSPORTATION OCCUPATIONS**  
**AUTOMOTIVE SERVICE EDUCATIONAL PROGRAM (ASEP)**  
**COURSE SYLLABUS**  
**January 24, 2023**

**I. CATALOG DESCRIPTION**

Course Number: ASEP 2212  
Course Title: GM Engine Repair  
Prerequisite: ASEP1111 & ASEP1116

Catalog Description: This course covers theory of engine operation and construction of General Motors gasoline engines. Testing and diagnosis of engine mechanical condition. Complete engine disassembly, component inspection, measurement, and reassembly. Covers principles of vibration (NVH) diagnosis and repair.

Credit Hours: 3.0  
Class Hours: 23  
Lab Hours: 68  
Total Contact Hours: 91

**II. COURSE OBJECTIVES: *Course will:***

- A.** Introduce basic 4-cycle internal combustion engine operation, designs, part identification, measurable and calculable engine specifications.
- B.** Discuss techniques and procedures for safe, proper and complete disassembly of General Motors engines.
- C.** Discuss cooling and lubrication system operation, inspection, diagnosis and testing of General Motors engines.
- D.** Discuss component purpose, function, construction, cleaning, inspection, measurement, and service procedures for General Motors engines.
- E.** Discuss techniques and skills for testing and diagnosis of mechanical condition for General Motors engines.
- F.** Discuss techniques and procedures for safe, and proper reassembly of General Motors gasoline engines including reassembly measurements, component orientations, bolt torque, and special tool usage.
- G.** Introduce NVH and the necessity for diagnosis and repair of such concerns.
- H.** Discuss theory, diagnosis and repair of NVH concerns according to General Motors Service Information and procedures.

**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 Motors Service Information procedures.
- 2. Recall basic operation, design, and part identification of a 4-cycle internal combustion engine.
- 3. Calculate engine compression ratio and displacement.
- 4. Explain engine cooling system operation and diagnosis for GM engines.

5. Explain engine lubrication system operation and diagnosis for GM engines.
6. Perform complete disassembly, cleaning, inspection of GM engine assemblies.
7. Inspect GM engine components for cracks and abnormal wear, and perform accurate measurements. Assess the results and determine necessary service based on General Motors Service Information.
8. Perform Timesert thread repair as per GM Service Information.
9. Perform complete reassembly of GM engine assemblies including: GM special service tool usage, reassembly measurements to verify proper installation of components, accurate bolt torque/angle, gasket replacement, use of torque to yield bolts, use of gaskets, gasket sealers, thread sealants and thread lockers.
10. Recall diagnostic tests in GM Service Information to determine engine mechanical condition.
11. Investigate General Motors engine mechanical service bulletins summarize content.
12. Recall principles and theory of NVH (noise, vibration and harshness).
13. Utilize Picoscope to record vehicle vibrations including: engine, wheel/tire, and propshaft speed related vibrations according to General Motors Service Information and procedures.
14. Analyze recorded Picoscope information to determine source of vehicle vibrations including: engine, wheel/tire, and propshaft speed related vibrations according General Motors Service Information and procedures.
15. Perform component inspections based on Picoscope findings to determine the root cause of engine, wheel/tire and propshaft speed related vibrations according to General Motors Service Information and procedures.
16. Explain diagnostic principles for wheel/tire vibration concerns.
17. Diagnose and correct wheel/tire vibration concerns using Hunter Road force balancing techniques.
18. Recognize the importance of verifying the validity of the repair to ensure customer satisfaction.
19. Recognize the ethical responsibilities of proper automotive service in these areas and their responsibility in society for performing proper diagnosis and effective repair.

**B. GENERAL EDUCATION LEARNING OUTCOMES:**

**GELO #3: Critical Thinking & Problem Solving**

**Outcome:**

1. Collect, identify, interpret and analyze data.

**IV. CONTENT/UNIT OF INSTRUCTION**

- A. Gasoline engine operation, parts and specifications
- B. Coolant system operation and diagnosis
- C. Lubrication system operation and diagnosis
- D. Engine condition diagnosis
- E. Engine cleaning and crack detection
- F. Cylinder head and valve guide service
- G. Valve and seat service
- H. Camshaft and valve trains
- I. Variable valve timing systems
- J. Pistons, rings and connecting rods
- K. Engine blocks

- L. Crankshafts, balance shafts and bearings
- M. Gaskets and sealants
- N. Engine assembly
- O. Noise, vibration and harshness

**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 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.**