South Central College

AST 2752 Engine Performance and Drivability

Course Outcome Summary

Course Information

Description
This course emphasizes the accurate and efficient diagnosis and repair of drivability and emission system concerns associated with all aspects of engine operation. Particular attention will be placed on computerized engine management systems. (Prerequisite: Admission to the Automotive Service program)

Total Credits: 2
Total Hours: 48

Types of Instruction

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Pre/Corequisites

Admission to the Automotive Service program

Institutional Core Competencies

Communication - Students will be able to demonstrate appropriate and effective interactions with others to achieve their personal, academic, and professional objectives.

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
   Exhibit professional conduct, act responsibly, and accept responsibility for the successful and timely completion of assignments
   Identify and follow all shop operating and safety procedures

2. Describe the cause of engine performance and emission concerns - determine necessary action

   Learning Objectives
   Describe scan tool operation, retrieve diagnostic trouble codes, evaluate vehicle parameter identification data
Describe and test distributor, waste spark, and coil-on-plug ignition systems including analyzing ignition waveforms
Describe and diagnose a drivability or emission concern caused by a problem in the positive crankcase ventilation system, exhaust gas recirculation system, or evaporative emission system
Describe and diagnose a drivability or emission concern caused by a problem with the catalytic converter, a converter efficiency code, or the secondary air injection system

3. **Test the cause of engine performance and emission concerns - determine necessary action**

   **Learning Objectives**
   Verify and analyze customer drivability or emission concern, review vehicle service history, and technical service bulletins
   Analyze engine mechanical problems, perform a cylinder balance test, and check variable valve timing operation
   Analyze no start condition, hard start, cold and warm performance complaint, engine misfire, poor fuel economy, and power loss conditions
   Inspect and test computerized engine control system sensors, powertrain or engine control module operation, actuators, and circuits using a digital storage oscilloscope

4. **Diagnose the cause of engine performance and emission concerns - determine necessary action**

   **Learning Objectives**
   Evaluate and diagnose engine mechanical, electrical, fuel injection, ignition, and emission concerns
   Diagnose the cause of emission or drivability concerns with and without stored or active diagnostic trouble codes, graph and interpret scan tool data
   Diagnose drivability or emission problems caused by interrelated systems, e.g. security system, traction control, automatic transmission, and aftermarket accessories

5. **Repair or replace components**

   **Learning Objectives**
   Read and follow all required service manual procedures, caution statements, and technical service bulletins
   Replace the faulty component following the procedure outlined in the service information
   Determine if a component setup, coding, relearn, or system reprogram is required
   Clear stored trouble codes and verify proper engine and emission system operation following the repair
   Describe and perform an on-board diagnostic II monitor check to verify that the repair is complete

**SCC Accessibility Statement**
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Additional information and forms can be found at: [www.southcentral.edu/disability](http://www.southcentral.edu/disability)

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