

Minnesota State College Southeast

AUTO 1228: Engine and Diesel Performance Theory

A. COURSE DESCRIPTION

Credits: 2

Lecture Hours/Week: 2

Lab Hours/Week: *.*

OJT Hours/Week: *.*

Prerequisites: None

Corequisites: None

MnTC Goals: None

This course teaches the theory and operating principles of automotive computers, sensors, and control devices. It will include fuel injection theory as well as advanced test equipment and procedures that will lead to developing skills in diagnostics, testing, and correcting problems related to engine performance. (Prerequisites: AUTO1105, AUTO1106, AUTO1118, AUTO1208, or instructor approval) (2 Credits: 2 lecture/0 lab)

B. COURSE EFFECTIVE DATES: 04/27/1998 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Safety Procedures
2. Theory and Operating Principles of Automotive Computers, Sensors, and Control Devices
3. Advanced Carburation and Fuel Injection Theory
4. Testing Equipment and Procedures

D. LEARNING OUTCOMES (General)

1. Identify safety procedures
2. Identify technical information sources
3. Describe customer complaint procedures
4. Review basic engine system testing
5. Explain emission system operation
6. Explain emission system testing
7. Explain exhaust backpressure test
8. Explain vacuum leak testing procedures
9. Explain cylinder balance testing procedures
10. Explain scan tool operation
11. Explain lab scope test procedures
12. Explain data stream information
13. Explain exhaust gas data related to engine performance and driveability
14. Explain operation of fuel delivery systems
15. Explain spark management operation
16. Explain mode operation
17. Explain computer operation
18. Explain sensor operation and testing
19. Explain computer output actuators and testing procedures
20. Identify computer system schematics
21. Identify computer control system components
22. Complete mid-term exam
23. Explain torque converter clutch operation
24. Explain electronic shift
25. Explain computer system diagnosis
26. Explain OBD II drive cycle
27. Identify fuel injection systems and operation
28. Explain injector balance test
29. Explain diagnostic connector
30. Explain turbocharger operation
31. Explain supercharger operation
32. Explain multiplexing
33. Explain OBD II operation
34. Complete final exam

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted