

**HIBBING COMMUNITY COLLEGE
COURSE OUTLINE**

COURSE TITLE & NUMBER: Automotive Computers: ASES2027

CREDITS: 4 (34 Lec / 68 Lab)

PREREQUISITES: Instructor Approval

CATALOG DESCRIPTION:

Automotive Computers covers the operation and diagnosis of the engine control computer. The operation and diagnosis of the inputs and outputs used on Ford, GM, and Daimler Chrysler are stressed.

OUTLINE OF MAJOR CONTENT AREAS:

- I. Computer logic: computer circuitry
- II. Digital lab scope usage
- III. Computer power feeds
- IV. Computer grounds
- V. Computer inputs for domestic vehicles
 - A. Theory
 - B. Diagnosis
- VI. Computer outputs for domestic vehicles
 - A. Theory
 - B. Diagnosis
- VII. Scan-tool usage
- VIII. Basic scan data interpretation

COURSE GOALS/OBJECTIVES/OUTCOMES:

Students will

1. define duty cycle.
2. define ground side and feed side driver.
3. describe computer logic.
4. describe emission history.
5. identify computer memory types.
6. describe switch inputs.
7. explain analog input.
8. explain computer inputs.
9. explain computer outputs.
10. identify digital.
11. restate ohms law.
12. describe voltage drop.
13. describe test connector function.

14. describe trouble codes.
15. describe serial data.
16. explain component locator.
17. define fault codes.
18. draw data link connector.
19. test serial data.
20. describe fuel pump circuit.
21. use component locator.
22. check data link connector pins.
23. describe fault code activation.
24. retrieve diagnostic trouble codes.
25. operate scan tool.
26. diagnose DTC using manufacturer flow charts.
27. diagnose concerns using system based diagnosis.
28. describe O₂ feedback logic.
29. explain closed loop logic.
30. access trouble codes.
31. describe trouble code reading.
32. explain scan tool usage.
33. perform actuator tests using scan tool.
34. describe code erasing.
35. describe self test operation.
36. activate scan self-test.
37. define baud rate.
38. define root cause.
39. explain fuel injector operation.
40. test MAF function.
41. test MAP sensor operation.
42. test thermistor operation.
43. test O₂ sensor operation.
44. explain closed loop.
45. define clearing memory.
46. explain TPS operation.
47. explain DSO operation.
48. use DSO for circuit testing.
49. use DRUM to test computer inputs and outputs.
50. discuss interaction among engine, transmission and body functions.
51. interpret data stream information.
52. test proper fuel injector operation.
53. display fuel injector wave forms on DSO.
54. test relay controlled components and operation.
55. perform data record on scan tool.
56. test idle speed control device.

The instructor may deviate from the above list to meet industry changes and time or space availability.

MNTC GOALS AND COMPETENCIES MET:

N/A

HCC COMPETENCIES MET:

Working Productively & Cooperatively
Communicating Clearly & Effectively
Thinking Creatively & Critically

STUDENT CONTRIBUTIONS:

The student will

1. attend all lectures.
2. participate in discussion.
3. perform assigned tasks.
4. follow safety rules.

Attendance is critical: if the student is not present they cannot participate in or, contribute to the learning process.

**STUDENT ASSESMENT SHALL TAKE PLACE USING INSTRUMENTS
SELECTED/DEVELOPED BY THE COURSE INSTRUCTOR.**

**SPECIAL INFORMATION: (SPECIAL FEES, DIRECTIVES ON HAZARDOUS
MATERIALS, ETC.)**

Tasks lists, handouts, and other materials will be provided.
Safety glasses are required in the lab.

AASC APPROVAL DATE: December 18, 2013
--

REVIEW DATE: December 2018

ASES2027:so
121813