

**HIBBING COMMUNITY COLLEGE
COURSE OUTLINE**

COURSE TITLE & NUMBER: Advanced Ignition Systems: ASES 2020
CREDITS: 2 (17 Lec / 34 Lab)
PREREQUISITES: Instructor Approval

CATALOG DESCRIPTION: Advanced Ignition Systems covers the ignition systems that are not distributor based. The systems taught will be EI (electronic Ignition) and the COP (coil on plug) system. Theory of operation and the proper diagnostic and repair procedures will be covered.

OUTLINE OF MAJOR CONTENT AREAS:

- I. Review of basic ignition theory
- II. Waste-Spark system theory including diagnosis and repair
- III. EI ignition systems
 - A. GM
 - B. Ford
 - C. Chrysler
 - D. Import
- IV. Coil On Plug theory including diagnosis and repair
 - A. GM
 - B. Ford
 - C. Daimler Chrysler
 - D. Import

COURSE GOALS/OBJECTIVES/OUTCOMES:

Students will

1. explain ignition coil position feed circuit.
2. test DIS ignition coil ground.
3. test DIS ignition coil power feed.
4. test each DIS coil primary triggering signal.
5. check GM DIS identifier on the crank signal.
6. check GM DIS ignition coil secondary output.
7. check GM DIS ignition module RPM output.
8. describe E core coil precautions.
9. describe GM RPM REF. Wire.
10. explain GM coil negative control.
11. explain GM EST wire.

12. explain GM EST bypass wire.
13. explain GM RPM signal creation.
14. explain GM distributorless ignition.
15. replace ignition control module.
16. test GM DIS 18 X signal.
17. test GM DIS crankshaft (hall sw) 3X signal.
18. test GM dist. Ref. Input.
19. test GM ignition module bypass input.
20. check Chrysler DIS cam input.
21. check Chrysler DIS crank input.
22. check Chrysler DIS ignition coil secondary output.
23. explain Chrysler ASD relay circuit.
24. explain Chrysler distributorless ignition.
25. explain Chrysler coil neg. control.
26. explain Chrysler pos. coil feed circuit.
27. check for the identifier on Ford PIP input.
28. check Ford DIS camshaft input.
29. check Ford DIS crankshaft input.
30. check Ford DIS ignition coil secondary output.
31. check Ford ignition coil triggering output.
32. explain Ford PIP signal.
33. explain Ford SPOUT signal.
34. explain Ford IDM monitor.
35. explain Ford ignition coil neg. control.
36. explain basic theory of operation for COP systems.
37. explain the GM COP system.
38. explain the Ford COP system.
39. explain the Daimler Chrysler COP system.
40. check for no spark conditions on each of the domestic COP systems.
41. check for COP system misfires.
42. check primary circuit waveforms using a DSO.
43. diagnose no-start condition.
44. perform power balance using scan tool.
45. inspect and replace spark plugs and wires.

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 be expected to

1. attend all class sessions.
2. participate in class activities and discussions.
3. request assistance when needed .
4. complete and hand in assigned work when due.

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

STUDENT ASSESSMENT SHALL TAKEPLACE USING INSTRUMENTS SELECTED/DEVELOPED BY THE COURSE INSTRUCTOR.

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

Handouts and other materials will be provided in class.

Factory and aftermarket service manuals will be used for reference.

Safety glasses

AASC APPROVAL DATE: December 18, 2013
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REVIEW DATE: December 2018

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