

**HIBBING COMMUNITY COLLEGE
COURSE OUTLINE**

COURSE TITLE & NUMBER: ASES 1010: Brakes
CREDITS: 2 (Lecture Hours 17 / Lab Hours 34 per Semester)
PREREQUISITES: None

CATALOG DESCRIPTION:

Brakes covers basic principles of brakes, hydraulic system basics, disc and drum brakes, parking brakes and power assist units. Rear wheel anti-lock systems are also covered. Emphasis is placed on operation, diagnosis and repair of various types of braking systems.

OUTLINE OF MAJOR CONTENT AREAS:

- I. Wheel hub and bearings
 - A. Design
 - B. Service
- II. Brake hydraulics
 - A. Fluids, lines and hoses
 - B. Filling, flushing and bleeding
- III. Master cylinders
- IV. Brake-system control valves
 - A. Operation
 - B. Diagnosis
- V. Drum brakes
 - A. System operation
 - B. Removal and replacement
- VI. Disc brakes
 - A. Operation
 - B. Service
- VII. Brake measuring and machining
 - A. Brake rotor
 - B. Brake drum
- VIII. Power-assist units
 - A. Vacuum
 - B. Hydro-Boost
- IX. Rear-wheel anti-lock systems
 - A. Ford, G.M. and Chrysler
 - B. Diagnosis and service

COURSE GOALS/OBJECTIVES/OUTCOMES:

Students will

1. torque wheel lug nuts.
2. inspect wheel bearings.
3. repack wheel bearings.
4. adjust wheel bearings.
5. replace wheel bearing and race.
6. explain basic braking principles.
7. explain hydraulic operation.
8. identify dual master cylinder function.
9. flare steel brake line.
10. replace brake hose.
11. flush brake system.
12. inspect lines and hoses.
13. bench-bleed master cylinder.
14. store, select, handle and identify brake fluid.
15. explain diagonal brake system.
16. identify brake fluid loss.
17. describe metering valve operation.
18. describe proportioning valve operation.
19. identify duo-servo brake components.
20. identify non-servo brake components.
21. identify duo and non-servo brake component function.
22. inspect brake linings and/or pads.
23. replace rear brake shoes.
24. adjust brakes.
25. identify wheel cylinder parts.
26. replace wheel cylinder parts.
27. explain parking brake operation.
28. adjust parking brake.
29. identify disc brake components.
30. replace disc brake pads.
31. replace disc brake caliper.
32. measure brake drum.
33. measure disc brake rotor.
34. machine brake drum.
35. machine disc brake rotor.
36. explain vacuum-suspended booster operation.
37. explain hydraulic assist power brake operation.
38. diagnoses power brake vacuum and hydraulic assist operation.
39. describe rear-wheel anti-lock operation.
40. diagnose rear-wheel anti-lock system.

41. bleed and fill rear-wheel anti-lock system.
42. diagnose brake performance problems.
43. perform road test.
44. measure brake pedal height, travel and free play.
45. test brake fluid for contamination.

MNTC GOALS AND COMPENTENCIES MET:

N/A

HCC COMPETENCIES MET:

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

STUDENT CONTRIBUTIONS:

Students are expected to attend all lectures and participate in class discussions. Attendance in lecture and lab is crucial. All assignments must be completed when requested.

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

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

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

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