

**HIBBING COMMUNITY COLLEGE
COURSE OUTLINE**

COURSE TITLE & NUMBER: ASES 1021: Automatic Transmission/Transaxle
CREDITS: 5 (34 Lec / 102 Lab)
PREREQUISITES: Instructor approval.

CATALOG DESCRIPTION:

Automatic Transmission/Transaxle covers the operation, diagnosis and repair of automotive automatic transmissions and transaxles. Topics include internal components and operation, power flow through the unit, and overhaul.

OUTLINE OF MAJOR CONTENT AREAS:

- I. Safety precautions
- II. Fundamentals of hydraulics
 - A. Pascal's Law
 - B. Pressure versus surface area
- III. Internal components and operation
 - A. Holding devices
 - B. Driving devices
 - C. Planetary gear sets
 - D. Governors
 - E. Valve bodies
- V. Four speed trans operation-overdrive
 - A. Internal
 - B. Add-on
- VI. Torque converters
- VII. Service and overhaul

COURSE GOALS/OBJECTIVES/OUTCOMES:

Students will

- 1. describe transmission safety procedures.
- 2. perform transmission safety practices.
- 3. identify basic automatic transmission types.
- 4. describe converter operation.
- 5. inspect torque converters.
- 6. describe stall test procedure.
- 7. describe lock-up torque converter operation.
- 8. describe servicing automatic transmission.
- 9. identify special tool usage.

10. identify seals, function, and types.
11. describe planetary gears.
12. explain clutch and band operation.
13. explain power flow.
14. describe endplay requirements.
15. inspect case and components.
16. describe bearing and bushing replacement.
17. explain one-way clutch operation.
18. explain Pascal's Law.
19. explain friction materials.
20. explain multiple disc clutch operations.
21. explain basic valve types.
22. explain main control pressure system operation.
23. explain converter cooler and lube circuits.
24. describe governor system.
25. explain throttle valve system.
26. explain vacuum modulator testing procedures.
27. explain accumulator and servo systems.
28. describe basic valve body components and functions.
29. inspect valve body.
30. inspect governor assembly.
31. inspect front pumps.
32. trace basic hydraulic circuits.
33. describe TV system manual linkage adjustments.
34. describe basic pressure test procedure.
35. explain seal replacement.
36. inspect transmission bands.
37. explain band adjustment.
38. describe case repair.
39. describe pretest procedure.
40. describe road or dyno test.
41. describe linkage diagnosis.
42. describe throttle valve system diagnosis.
43. describe clutch and band diagnosis.
44. describe hydraulic pressure test.
45. describe converter and cooler cleaning and testing.
46. perform air pressure test.
47. describe governor systems analysis.
48. service cooler and lines.
49. replace modulator.
50. service filters.
51. perform road test.
52. perform stall test.
53. adjust shift linkage.
54. adjust throttle valve linkage and cable.
55. perform transmission pressure tests.

56. diagnose improper shifting.
57. diagnose overheating.
58. diagnose no-drive condition.
59. diagnose no individual gear condition.
60. diagnose abnormal noises.
61. remove and replace transmission.
62. overhaul transmission.
63. diagnose transmission leaks.
64. diagnose slippery condition.
65. describe TCC operations.
66. diagnose improper TCC operation.
67. check fluid level on trans without dipstick.
68. discuss trans fluid types and precautions.

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

MNTC GOALS AND CEOMETENCIES MET:

N/A

HCC COMPETENCIES MET:

Thinking Working Productively & Cooperatively
 Communicating Clearly & Effectively
 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 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
REVIEW DATE: December 2018

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