Course Outline

2026-2027 Catalog

AUT 56 - Manual Transmissions/Drivetrains Lecture

Catalog Description

Transfer Status: CSU

Prerequisite: AUT 3 (or concurrent enrollment)

Unit(s): 2.00

Lecture: 34.00 Contact hours/68.00 Out of class hours/102.00 Total hours/2.00 Unit(s)

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Course Description: This course provides theory and principles of operation in automotive manual transmissions/transaxles, drive lines and axles. Shop practice includes diagnostics, testing, and repairing of each system.

Objectives

Upon successful completion of this course, the student should be able to:

1. Identify the different types of manual transmission, transaxles and four wheel drive configurations used in cars and light trucks.
2. Describe power-flow through manual transmissions and transaxles.
3. Identify clutch related components using industry terminology and describe the theory and operation of the clutch system.
4. Distinguish the difference between Constant Velocity (CV) joints and propeller shafts and describe the operational characteristics of them both.
5. Identify the components and describe power-flow through differential assemblies.

Course Content

Topic Titles / Suggested Time Topic

Lecture

Topics	Lec Hrs
Transmission and transaxle identification, gear types and theory of operation.	3.00
Rear wheel drive transmission powerflow.	2.00
Rear wheel drive transmission synchronizer operation, shifting, and shifting mechanisms.	2.50
Front wheel drive transaxle power-flow.	2.00
Front wheel drive transaxle synchronizer operation, shifting, and shifting mechanisms.	3.00
Transmission and transaxle diagnosis and repair.	2.00
Clutch component identification and clutch system description and operation.	2.50
Clutch system diagnosis and repair.	2.00
Drive shaft and half shaft component identification and description of operation.	1.00
Drive shaft and half shaft diagnosis and repair.	2.00
Differential and drive axle component identification and theory of operation.	3.00
Differential and drive axle diagnosis and repair.	3.00
Four wheel drive system and transfer case component identification. Four wheel drive system theory of operation.	2.00
Four wheel drive and transfer case diagnosis and repair.	2.00
Electronic four wheel drive systems theory of operation and diagnostics.	2.00
Total Hours:	**34.00**

Methods of Instruction

A. Class Activities
B. Demonstrations
C. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
D. Instructor Demonstrations
E. Lecture

Methods of Evaluation

A. Exams/Tests
B. Quizzes
C. Homework
D. Class participation
E. Final Examination

Examples of Assignments

Reading Assignments

1. Read the assigned reading on manual transmission power-flow. Complete the assigned end of chapter quiz.
2. Using Mitchell or All Data, read the procedure on checking mainshaft end play and demonstrate the procedure to the instructor.

Writing Assignments

1. In at least 100 words, write in your workbook the powerflow in a manual 5-speed transmission in reverse gear. Be prepared to discuss in class.
2. Fill out a repair order on the front and back using B.A.R. standards and ensure the story has the "3 C's".

Out-of-Class Assignments

1. View the videos and animations provided by the instructor related to powerflow, complete the weekly quiz assignment, and submit to the instructor.
2. Using Mitchell or Alldata, locate the procedure to service the manual transmisssion on one of our manual powertrain vehicles. Using 100 words, summarize the steps into a narrative. Note any cautions. Be prepared to discuss in class.

Recommended Materials of Instruction

Erjavec, J., et al. (2026). Today's Technician: Manual Transmissions and Transaxles Classroom Manual and Shop Manual. *Cengage, 8th.* 9780357935286.

Minimum Qualifications

Automotive Technology

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