

BUTTE COLLEGE

COURSE OUTLINE

I. CATALOG DESCRIPTION

AUT 56 - Manual Transmissions/Drivetrains Lecture

2 Unit(s)

Prerequisite(s): AUT 41 (or concurrent enrollment)

Co-requisite(s): AUT 57

Recommended Prep: AUT 1

Transfer Status: CSU

35 hours Lecture

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.

II. OBJECTIVES

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

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

III. COURSE CONTENT

A. Unit Titles/Suggested Time Schedule

Lecture	
<u>Topics</u>	<u>Hours</u>
1. Transmission and transaxle identification, gear types and theory of operation.	3.00
2. Rear wheel drive transmission powerflow.	2.00
3. Rear wheel drive transmission synchronizer operation, shifting, and shifting mechanisms.	3.00
4. Front wheel drive transaxle power-flow.	2.00
5. Front wheel drive transaxle synchronizer operation, shifting, and shifting mechanisms.	3.00
6. Transmission and transaxle diagnosis and repair.	2.00
7. Clutch component identification and clutch system description and operation.	3.00
8. Clutch system diagnosis and repair.	2.00
9. Drive shaft and half shaft component identification and description of operation.	1.00
10. Drive shaft and half shaft diagnosis and repair.	2.00
11. Differential and drive axle component identification and theory of operation.	3.00
12. Differential and drive axle diagnosis and repair.	3.00

13. Four wheel drive system and transfer case component identification. Four wheel drive system theory of operation.	2.00
14. Four wheel drive and transfer case diagnosis and repair.	2.00
15. Electronic four wheel drive systems theory of operation and diagnostics.	2.00
Total Hours	35.00

IV. METHODS OF INSTRUCTION

- A. Lecture
- B. Collaborative Group Work
- C. Class Activities
- D. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
- E. Discussion
- F. Demonstrations
- G. Problem-Solving Sessions
- H. Reading Assignments
- I. Multimedia Presentations

V. METHODS OF EVALUATION

- A. Exams/Tests
- B. Quizzes
- C. Homework
- D. Group Participation
- E. Final Examination

VI. EXAMPLES OF ASSIGNMENTS

- A. 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.
- B. Writing Assignments
 - 1. Fill out a repair order on the front and back using B.A.R. standards and ensure the story has the "3 C's".
 - 2. In your work book, describe powerflow in a manual 5-speed transmission in reverse gear.
- C. Out-of-Class Assignments
 - 1. PACT students complete the cognitive modules found in Honda's Online University related to manual transmissions, transaxles, and four wheel drive systems.
 - 2. View the videos and animations provided by the instructor related to powerflow, complete the weekly quiz assignment, and submit to the instructor.

VII. RECOMMENDED MATERIALS OF INSTRUCTION

Textbooks:

- A. Jack Erjavec. Today's Technician: Automatic Transmissions and Transaxles Set. 6th Edition. Cengage Learning, 2015.