



Course Outline

2026-2027 Catalog

AUT 60 - EV, Hybrid and Alternative Fuel Technologies

Catalog Description

Transfer Status: CSU

Prerequisite: AUT 3

Unit(s): 2.00

Lecture: 17.00 Contact hours/34.00 Out of class hours/51.00 Total hours/1.00 Unit(s)

Lab: 51.00 Contact hours/0.00 Out of class hours/51.00 Total hours/1.00 Unit(s)

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

Course Description: This course covers the theory of operation and service of electric vehicles and other alternative fuel-powered cars and light trucks. Topics include fuel tank and high-voltage battery inspection service, regenerative braking systems, motor/generator and transmission, and fuel cell technologies. Emphasis is placed on safety precautions necessary when servicing electric, hybrid and alternative-fueled vehicles. Students will be working on and around the high voltage electrical systems.

Objectives

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

1. Identify and practice the specific safety precautions to take when servicing EV, hybrid and other alternative-fueled vehicles.
2. Identify the different types of fuels used in alternative fuel and clean diesel vehicles, and apply fuel-specific repair procedures to diagnostics and servicing.
3. Distinguish between series, parallel, and pure electric vehicles.
4. Describe principles of electricity and electromagnetism and explain their application in EV and hybrid vehicles.
5. Identify high voltage and high pressure components to explain and perform safe service procedures on EV, hybrid and other alternative-fueled vehicles.

Course Content

Topic Titles / Suggested Time Topic

Lecture

<u>Topics</u>	<u>Lec Hrs</u>
Introduction to EV, hybrid and alternative fueled vehicles.	2.00
EV, Hybrid and alternative fuel vehicle safety precautions and tools.	5.00
Alternative fuel tank inspection and service procedures.	2.00
EV and Hybrid battery inspection and battery service precautions.	3.00
EV and Hybrid motor/generator inspection and service precautions.	2.00
EV and Hybrid regenerative braking system service and safety precautions.	1.00
EV and Hybrid climate control service and safety precautions.	1.00
EV, Hybrid and other alternative-fueled vehicles specific tools and testers.	1.00
Total Hours:	17.00

Lab

<u>Topics</u>	<u>Lab Hrs</u>
Identifying EV, hybrid, and alternative fuel vehicle systems.	12.00
EV, Hybrid, and alternative fuel safety precautions and tool use.	12.00
Alternative fuel tank identification, inspection and certification procedures.	6.00
EV and Hybrid battery service.	6.00
EV and Hybrid motor/generator service.	6.00
EV and Hybrid braking system service.	3.00
EV and Hybrid transmission service.	3.00
EV and Hybrid heating and air conditioning service.	3.00
Total Hours:	51.00

Methods of Instruction

- A. Collaborative Group Work
- B. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
- C. Instructor Demonstrations

- D. Lecture
- E. Reading Assignments

Methods of Evaluation

- A. Exams/Tests
- B. Quizzes
- C. Demonstration
- D. Class participation
- E. Final Examination
- F. Performance Examinations

Examples of Assignments

Reading Assignments

- 1. Using All Data or Mitchell, interpret the service procedures for the assigned vehicle system and be ready to discuss in class.
- 2. Read the chapter about EV battery safety and servicing, then complete the questions at the end of chapter review, and be prepared to discuss in class.

Writing Assignments

- 1. Complete the work sheets in the supplied lab work book titled "Battery Safety and Servicing," and submit to the instructor for grading.
- 2. Complete a repair order following B.A.R. requirements. When you have completed the prescribed service, write a story on the back of the R.O. and make sure it contains the "3 C's".

Out-of-Class Assignments

- 1. Complete "Mechanical Safety" training using the S/P2 online safety website, print out certificate of completion and submit to the instructor.
- 2. Write a short explanation that shows your understanding of how to use a megohm meter. Your response should describe the proper operation and purpose of the tool, identify the type of fault it is designed to diagnose, and outline the steps or flow of diagnosis while using it. Finally, explain how to read and interpret the scale of the meter.

Recommended Materials of Instruction

Halderman, J. & Ward, C. (2026). Electric & Hybrid Electric Vehicles. *Pearson*, 1st. 9780135434215.

Minimum Qualifications

Automotive Technology

Created/Revised by: Kielb, Craig

Date: 12/01/2025