



Course Outline

2026-2027 Catalog

AUT 30 - Gas/Diesel Engine Performance Lecture

Catalog Description

Transfer Status: CSU

Prerequisite: AUT 3 (or concurrent enrollment)

Unit(s): 5.00

Lecture: 85.00 Contact hours/170.00 Out of class hours/255.00 Total hours/5.00 Unit(s)

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Course Description: This course introduces the theory, operation, and repair of the ignition, fuel, engine management, and emission control systems on gasoline and diesel-powered vehicles. It will help students identify, analyze and devise comprehensive assessments and diagnostic procedures of vehicle issues or abnormal operations commonly seen in the industry.

Objectives

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

1. Describe the theory and operation of various types of automotive ignition systems.
2. Describe the theory and operation of various types of gasoline and diesel fuel systems.
3. Describe the theory and operation of the gasoline and diesel computer-controlled engine management system.
4. Describe the theory and operation of various gasoline and diesel engine emission control systems.
5. Describe the theory and operation of gasoline and diesel induction and exhaust systems.
6. Properly use scan tools to monitor, interpret, record, play-back and up-load ve data stream information.
7. Create an industry-based diagnostic procedure that appropriately considers all systems and sub-systems of the modern automobile.

Course Content

Topic Titles / Suggested Time Topic	
<u>Lecture</u>	
<u>Topics</u>	<u>Lec Hrs</u>
Ignition and glow plug system theory, design, operation and diagnosis.	18.00
Gasoline and diesel fuel system theory, design, operation, and diagnosis.	18.00
Theory, design, and operation of gasoline and diesel computer-controlled engine management systems, and diagnosis.	18.00
Theory, design, and operation of gasoline and diesel emission control systems, and diagnosis.	18.00
Theory, design, and operation of gasoline and diesel induction and exhaust systems, and diagnosis.	8.00
Properly use and understand scan tool operation and navigation for diagnosis of failed systems.	5.00
Total Hours:	85.00

Methods of Instruction

- A. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
- B. Instructor Demonstrations
- C. Lecture
- D. Multimedia Presentations
- E. Problem-Solving Sessions
- F. Reading Assignments

Methods of Evaluation

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

Examples of Assignments

Reading Assignments

1. After reading the chapter on "Electronic Fuel Injection" in the Engine Performance Classroom Manual, be prepared to verbally discuss how the fuel injector pulse width is affected by changes in engine load and RPM.

2. After reading the section on “Four Stroke Engines” in the Engine Performance textbook, be prepared to verbally describe the differences between the Otto-cycle and Atkinson-cycle 4-stroke engine design.

Writing Assignments

1. In the AUT 30 Homework Book, write short answers of at least 30 words, for each of the ten questions at the end of Chapter 8 "Electronic Fuel Injection," in the Engine Performance Classroom Manual.
2. In the AUT 30 Homework Book, write a 100-word response explaining the relationship of the three exhaust gases (CO, HC, NOx), and explain how a catalytic converter can minimize these gases.

Out-of-Class Assignments

1. Research current California Diesel Exhaust emission requirements, then post an original response in the discussions. Summarize what you read in at least 200 words. Reply to two of your peers' posts. Be prepared to discuss in class.
2. In at least 100 words, post an original discussion about new or emerging technology in the area of "Engine Performance." Reply to two of your peer's posts. Be prepared to discuss in class.

Recommended Materials of Instruction

Goodnight, N. & VanGelder, K. (2019). Automotive Engine Performance. *Jones & Bartlett*, 1st. 9781284102062.

Wright, G. (2019). Light Vehicle Diesel Engines. *Jones & Bartlett*, 1st. 9781284145090.

Minimum Qualifications

Automotive Technology

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