Course Outline

2026-2027 Catalog

AUT 31 - Gas/Diesel Engine Performance Lab

Catalog Description

Transfer Status: CSU
Prerequisite: AUT 3
Corequisite: AUT 30
Unit(s): 5.00
Lab: 255.00 Contact hours/0.00 Out of class hours/255.00 Total hours/5.00 Unit(s)
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Course Description: In this course, students will develop and demonstrate the hands-on skills needed to diagnose and repair the ignition, fuel, engine management, and emission control systems used in today's gasoline and diesel vehicles. This course will help prepare the student to take the California State Smog Check Inspector and Repair Technician Licensing Exams.

Objectives

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

1. Diagnose and repair various vehicle ignition system problems, using industry-approved tools and techniques.
2. Diagnose and repair various gasoline and diesel fuel system problems, using industry- approved tools and techniques.
3. Diagnose and repair various gasoline and diesel computer-controlled engine management system problems, using industry-approved tools and techniques.
4. Diagnose and repair various gasoline and diesel emission control system problems, using industry-approved tools and techniques.
5. Diagnose and repair various gasoline and diesel induction and exhaust components
6. Properly use scan tools to monitor, interpret, record, play-back and up-load vehicle data stream information

Course Content

Topic Titles / Suggested Time Topic

Lab

Topics	Lab Hrs
Testing and repair of conventional and electronic automotive ignition systems, and diesel glow plug systems.	55.00
Testing and repair of various types of gasoline and diesel fuel systems, to include throttle body injection, multi-port fuel injection, and direct injection.	55.00
Testing and repair of various types of gasoline and diesel computer-controlled engine management systems. This section will also include working with On-Board Diagnostics 2nd Generation (OBDII) and Controller Area Network (CAN) type systems.	55.00
Testing and repair of various gasoline and diesel emission control systems, to include Positive Crankcase Ventilation (PCV), Evaporative Emission Control (EVAP), Exhaust Gas Recirculation (EGR), Air Injection Reactor (AIR), and catalytic converters (CAT).	55.00
Test and repair of gasoline and diesel induction and exhaust systems	17.00
Properly use and understand scan tool operation and navigation for diagnosis	18.00
Total Hours:	**255.00**

Methods of Instruction

A. Collaborative Group Work
B. Instructor Demonstrations
C. Laboratory Experiments
D. Problem-Solving Sessions
E. Reading Assignments

Methods of Evaluation

A. Class participation
B. Lab Projects
C. Final Examination
D. Performance Examinations
E. Practical Evaluations
F. Laboratory evaluation will be by observation and the number of completed jobs which are documented by job sheets and a hands-on performance lab final.

Examples of Assignments

Reading Assignments

1. Read the chapter on "Electronic Fuel Injection" in the Engine Performance Shop Manual. After studying this material, be prepared to demonstrate an injector balance test and a fuel pressure test.
2. Read the chapter on "Emission Control System Diagnosis and Service" in the Engine Performance Shop Manual. After studying this material, be prepared to demonstrate how to test a catalytic converter and an exhaust gas recirculation (EGR) system.

Writing Assignments

1. Perform a Smog Check Inspection in the lab. Complete a customer repair order following the standards set forth by the California BAR.
2. In the AUT31 Lab Worksheets Book, complete the "OBDII Lab Worksheet". The final requirement of this worksheet is to look up the OBDII Drive Cycle Enable Criteria, for the vehicle that you are working on. Describe, in writing, the difficulties that you might have in completing the drive cycle, such as traffic conditions, terrain, vehicle conditions, time required, etc. This writing assignment must be at least 100 words.

Out-of-Class Assignments

1. Go to an automotive repair facility of your choice (dealership, independent shop, or chain store) to observe the shop operations including the flow of repair orders, the parts ordering process, the technicians at work, etc. Post a blog of at least 300 words, describe your experiences at this facility. Read and comment on at least one other blog.
2. Pick a day when the BAR Smog Check Referee is working at the B.C. Skyway Center, and observe the work being performed. Post a blog of at least 300 words, comparing and contrasting the Referee to a Smog Check Station. Read and comment on at least one other blog.

Recommended Materials of Instruction

Pickerell, Ken. (2018). Today's Technician Automotive Engine Performance Classroom & Shop Manuals. *Delmar Cengage Learning, 7th.*

Other Learning Materials

Safety glasses

Minimum Qualifications

Automotive Technology

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