

Las Positas College
3000 Campus Hill Drive
Livermore, CA 94551-7650
(925) 424-1000
(925) 443-0742 (Fax)

Course Outline for APAU 97N
ENHANCED CLEAN AIR CAR COURSE
Effective: Spring 2017

I. CATALOG DESCRIPTION:

APAU 97N — ENHANCED CLEAN AIR CAR COURSE — 1.50 units

This course covers the operating procedures of the BAR-97 dynamometer smog testing equipment and procedures as well as advanced diagnostic and repair procedures to repair vehicles that fail the loaded mode emission test. Industry Advisory: Successful completion of the Basic Clean Air Car Course is required to enroll in this class. In order to be eligible to take the State Licensing Exam at completion of the course/program, students must also have one-year trade experience in engine performance/emissions, or nine semester units (13 quarter units) in Automotive Technology, or 180 hours at an accredited automotive school. Only students who are part of the automotive apprenticeship may enroll in an APAU class. 1 hour lecture, 1.5 hours laboratory.

1.00 Units Lecture 0.50 Units Lab

Grading Methods:

Discipline:

	MIN
Lecture Hours:	18.00
Lab Hours:	27.00
Total Hours:	45.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

IV. MEASURABLE OBJECTIVES:

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

1. analyze and diagnose a vehicle with emission control problems, including NOx problems, to a criterion established by the instructor based on Bureau of Automotive Repair and industry standards
2. demonstrate setup and operation of diagnostic and testing equipment including but not limited to Digital Storage Oscilloscope, BAR97 smog machine, and a dynamometer. Explain results obtained during operation of said equipment
3. demonstrate loaded mode emissions base lining techniques and use of diagnostic flow charts
4. explain catalytic converter theory, operation, and efficiency testing procedures
5. explain and demonstrate the differences in emissions testing procedures between the BAR90 and the BAR97 gas analyzer systems including dynamometer use of the Enhanced Smog Check Program

V. CONTENT:

- A. The (20 hour) Advanced Clean Air Car Course will cover:
 1. Nox emissions diagnostic and repair procedures
 2. Setup and operation of a Digital Storage Oscilloscope (DSO), and oxygen sensor waveform analysis
 3. Loaded mode emissions base lining techniques, and application of BAR's diagnostic flowcharts
 4. Catalytic converter theory, operation, and efficiency testing procedures
- B. The (8 hour) BAR97 Dynamometer Transition Course covers operating and emissions testing procedures using the BAR97 5-Gas Analyzer and dynamometer for the Enhanced Smog Check Program.

VI. METHODS OF INSTRUCTION:

- A. **Audio-visual Activity** -
- B. **Lab** - Hands-On Lab Exercises
- C. **Discussion** -
- D. **Lecture** -

VII. TYPICAL ASSIGNMENTS:

A. Read each module in the text and be prepared to seek clarification and ask questions in class.. B. Orally discuss the material covered in each chapter. C. Complete the review questions and related lab exercises for each chapter. 1. High levels of Nox emissions are created whenever the temperature inside any part of the combustion chamber exceeds _____degrees F. 2. A three-way catalytic converter is capable of reducing what tailpipe emissions? D. Read, interpret, and apply a Vehicle Information Report and a diagnostic flow chart to a hands-on emissions related diagnostic lab exercise.

VIII. EVALUATION:

A. **Methods**

1. Exams/Tests
2. Class Participation
3. Lab Activities

B. **Frequency**

1. Weekly Quizzes
2. Weekly Lab Assignments
3. Midterm
4. Final

IX. TYPICAL TEXTS:

1. S. Myron Maurseth *Advanced Emissions Diagnostics.*, Automotive Technology, 1997.
2. Bureau of Automotive Repair *Revision 6 Smog Check Inspection Manual.*, Department of Consumer Affairs, 2004.
3. Bureau of Automotive Repair *Laws and Regulation.*, Department of Consumer Affairs, 2004.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

- A. Safety glasses – required
- B. Slip resistant, steel-toed boots