

Las Positas College  
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## Course Outline for APAU 97L

### AUTOMOTIVE TESTING & DIAGNOSIS

Effective: Fall 2009

#### I. CATALOG DESCRIPTION:

APAU 97L — AUTOMOTIVE TESTING & DIAGNOSIS — 4.00 units

Inspection, diagnosis and repair of connected and related components, and malfunctioning parts; replacing and adjusting components for maximum efficiency and emission standards. Students are encouraged to enroll in Automotive Lab concurrently. Only students who are part of the automotive apprenticeship may enroll in an APAU class. 3 hours lecture, 3 hours laboratory.

3.00 Units Lecture 1.00 Units Lab

#### Grading Methods:

#### Discipline:

	<b>MIN</b>
<b>Lecture Hours:</b>	54.00
<b>Lab Hours:</b>	54.00
<b>Total Hours:</b>	108.00

#### II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 3

#### III. PREREQUISITE AND/OR ADVISORY SKILLS:

#### IV. MEASURABLE OBJECTIVES:

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

1. research Rules and Regulations for Smog Check Stations, and Technicians
2. Emission control Theory and Operation
3. Test Analyzer System (TAS) operation
4. Computer System Theory
5. Diagnosis and repair of computerized Vehicles
6. Outline hazardous waste handling
7. Maintain a clean professional environment

#### V. CONTENT:

- A. Rules and Regulations
  1. Research Rules and Regulations
    - a. Smog Check Stations
    - b. Smog Check Technicians
- B. Emission Control Theory and Operation
  1. Discuss impact of automotive emissions on the environment
  2. Evaluate exhaust gas emission smog test results
- C. Test Analyzer System (TAS) operation
  1. TAS calibration
    - a. Perform three day calibration
  2. TAS Maintenance
    - a. Service filters
    - b. Lock out procedures
- D. Computer System Theory
  1. Closed and Open Loop operation
    - a. Closed Loop operation
      1. Components and function
    - b. Open Loop operation
      1. Components and function
- E. Diagnosis and repair of computerized Vehicles
  1. Analyze Emission system function and failures
    - a. Proper closed loop operation
    - b. System malfunction inspection and repair
- F. Handling of hazardous waste materials
  1. Storage and handling of gasoline
  2. Storage and handling of diesel fuel
- G. Professional environment

1. Safety glasses (clear lens) worn in all Laboratory areas
2. No loose clothing (coveralls strongly recommended)
3. Long Hair secured
4. No open toe shoes (safety shoes recommended)
5. Work areas maintained: clean free of debris and spills.

#### VI. METHODS OF INSTRUCTION:

- A. **Audio-visual Activity** - 1. PowerPoint presentations 2. Mockup parts from automotive
- B. **Discussion** - Group discussion
- C. **Lecture** -
- D. Student Hands-on labor

#### VII. TYPICAL ASSIGNMENTS:

- A. Lecture based assignments 1. Text reading 2. Oral presentation 3. Class discussion B. Lab based assignments 1. Completion of applied activities 2. Lab activity worksheet 3. Diagnosis and debugging C. Student Lab work sheets with emphasis on Hands-on applications D. Review of Lab sheets in both Lab and class settings E. Text reading assignments F. Class discussions of reading assignments G. Demonstrations pertaining to reading assignments

#### VIII. EVALUATION:

##### A. **Methods**

1. Exams/Tests
2. Quizzes
3. Projects
4. Home Work
5. Lab Activities

##### B. **Frequency**

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

#### IX. TYPICAL TEXTS:

1. Hollembeak, Barry *Automotive Fuels & Emissions Classroom Manual.*, Thomson Delmar Learning, 2005.
2. Hollembeak Barry *Automotive Fuels & Emissions Shop Manual.*, Thomson Delmar Learning, 2005.
3. James D. Halderman *Automotive Technology: Principles, Diagnosis, and Service.* 2nd ed., Prentice Hall, 2003.

#### X. OTHER MATERIALS REQUIRED OF STUDENTS:

- A. Safety Glasses