Las Positas College
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Course Outline for AUTO 67B

SPECIAL ADV DIAG/TRBLSHTNG

Effective: Fall 2008

I. CATALOG DESCRIPTION:
AUTO 67B — SPECIAL ADV DIAG/TRBLSHTNG — 4.00 units

Continuation of Automotive Technology 67A and 61B with an emphasis on diagnosis of complex electronic problems in computer controlled systems. Students are strongly recommended to enroll in Automotive Lab concurrently. Prerequisite: Automotive 67A (completed with a grade of "C" or higher).

3.00 Units Lecture 1.00 Units Lab

Prerequisite
AUTO 67A - Adv Diag/Trblshtng Auto Sys
with a minimum grade of C

Strongly Recommended
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Grading Methods:
Letter or P/NP

Discipline:

	MIN
Lecture Hours:	54.00
Lab Hours:	54.00
Total Hours:	108.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 4

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering the course a student should be able to:

A. AUTO67A
1. obtain and interpret scan tool data, retrieve and record stored On Board Diagnostics (OBD) diagnostic trouble codes, and other On Board controllers;
2. diagnose the causes of electrical failures or concerns resulting from malfunctions in the computerized control systems with or without diagnostic trouble codes;
3. chart, inspect and test computerized engine control system sensors, Powertrain control module (PCM), actuators, and circuits using a graphing multi-meter (DMM)/digital storage oscilloscope (DSO), and perform necessary action;
4. access and use service information to perform step-by-step diagnosis;
5. evaluate complex electrical system problems;
6. develop diagnostic paths using wiring schematics;
7. diagnose malfunctions of electronic control systems causing vehicle performance problems, and determine necessary action;
8. outline hazardous waste handling
9. maintain a clean professional environment.

IV. MEASURABLE OBJECTIVES:

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

A. evaluate communication systems using multiplexing designs;
B. explore the impact of high resistance circuits on computerized vehicles;
C. inspect and test computerized engine control system sensors, Powertrain control module (PCM), actuators, and circuits using a graphing multi-meter (DMM)/digital storage oscilloscope (DSO), and perform necessary action, evaluate results;
D. access and use service information, and develop your own diagnostic flow charts;
E. plot and graph oscilloscope patterns, make evaluations to know good patterns;
F. evaluate complex electrical system problems;
G. outline hazardous waste handling;
H. maintain a clean professional environment.

V. CONTENT:

A. Communication systems
    1. Multiplex evaluation of:
        a. High speed systems
        b. Low speed systems
    2. Interpretation of information
        a. Factory set procedures
        b. Develop own diagnostic procedures
B. Evaluation of high resistance circuits
    1. Ohm's law practical application
    2. Voltage drop techniques
C. Diagnostic patterns, and analyze scope readings
    1. Digital storage oscilloscope usage
        a. Scope connection
        b. Pattern interpretation
D. Diagnostic service information
    1. Access service information (electronic)
        a. Application of information
    2. Access service information (paper)
        a. Application of information
    3. Research and develop students diagnostic approach
E. Oscilloscope testing
    1. Oscilloscope operation
        a. Scope set up
        b. Pattern reading procedures
        c. Pattern graphing
        d. Comparative analysis of data
    2. Explain theory and functionality of various systems; Engine, chassis, and Body control systems
    3. Explore design application for various sensors
        a. Sensor contributions
    4. Describe operation of sensors under operating conditions
        a. Sensor at operation faults and caricaturized fail modes
F. Handling of hazardous waste materials
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. **Lecture** -
B. **Audio-visual Activity** - PowerPoint presentations, Mockup parts from automotive
C. **Lab** - Student Hands-on laboratory activities and assignments
D. **Discussion** - Group discussion

VII. TYPICAL ASSIGNMENTS:
A. Lecture based assignments 1. Text reading 2. Oral presentation 3. Class discussion 2. Lab based assignments 1. Completion of applied activities 2. Lab activity worksheet 3. Diagnosis and debugging 3. Student Lab work sheets with emphasis on Hands-on applications 4. Review of Lab sheets in both Lab and class settings 5. Text reading assignments 6. Class discussions of reading assignments 7. Demonstrations pertaining to reading assignments

VIII. EVALUATION:
A. **Methods**

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

B. **Frequency**

IX. TYPICAL TEXTS:
1. Hollembeak, Barry, *Automotive Fuels & Emissions Classroom Manual,.*, Thomson Delmar Learning, 2005.
2. Hollembeark Barry *Automotive Fuels & Emissions Shop Manual.*, Thomson Delmar Learning, 2005.
3. Safety Glasses

X. OTHER MATERIALS REQUIRED OF STUDENTS: