Las Positas College
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Course Outline for AUTO 60B

AUTO ELECTRICS/ELECTRONICS II

Effective: Fall 2008

I. CATALOG DESCRIPTION:
AUTO 60B — AUTO ELECTRICS/ELECTRONICS II — 4.00 units

Continuation of Automotive Technology 60A with emphasis on diagnosis and repair of electrical/electronic components including computer controlled circuits/systems using schematics, diagnostic procedures, and equipment; and repair. Students are strongly recommended to enroll in Automotive Lab concurrently. Prerequisite: Automotive Technology 60A (completed with a grade of "C" or higher). 3 hour Lecture, 3 Hour Laboratory.

3.00 Units Lecture 1.00 Units Lab

Prerequisite
AUTO 60A - Auto Electrics/Electronics I
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. AUTO60A
1. diagnose and repair basic automotive battery, starting, charging systems;
2. use electrical test equipment for accurate diagnosis of electrical systems and sub-systems;
3. use problem-solving skills to categorize systems faults in automotive circuits and make needed repairs;
4. identify types of ignition systems;
5. describe and evaluate fuel control circuits for proper operation;
6. explain the fundamentals of electronic and electrical theories;
7. conduct circuit and wire repairs;
8. demonstrate safe and appropriate hazardous material handling;
9. maintain a clean and professional environment.

IV. MEASURABLE OBJECTIVES:

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

A. Diagnose and repair basic automotive electrical systems;
B. Use basic electrical testing equipment in correctly diagnosing electrical problems on today's automobiles
C. Use problem solving skills to break down automotive circuits and troubleshoot them
D. Demonstrate the use of digital meters on electronic components and communication systems;
E. Identify fundamentals of electronic theories, Ohms Law;
F. Describe theory and practical application of multiplex communication systems;
G. Categorize safety, security systems diagnosis and repair
H. Outline body controller systems
I. List Ignition, emission and power train system
J. Research wiring System 1. Schematic reading and deciphering;J. Research wiring System
K. Review hazardous material handling;
L. Distinguish safe shop environment from unsafe environment.

V. CONTENT:
- A. Diagnose and Repair
  1. Identify problem area
  2. Perform needed repairs
- B. Diagnostic tool usage
  1. Operate scanners for “On Board Computers”
  2. Demonstrate competency in Digital volt ohm meter and test light usage
- C. Problem solving
  1. Evaluate system functions
  2. Formulate diagnostic approach
     a. Use diagnostic trouble charts
     b. Develop problem ranking skills
- D. Components and Communication systems
  1. Explain function of communication systems
     a. UART
     b. Class II
     c. LAN
  2. Detect plus width action between controllers
  3. Measure signals
     a. Use of Digital volt meters
     b. Operate digital storage oscilloscope
- E. Fundamentals of electronic theories
  1. Explain ohms law and circuit function
- F. Multiplex communication systems
  1. Categorize types of communication systems
     a. Explain types and functions
- G. Safety, security systems
  1. Safety
     a. List types of Anti-lock Brake Systems “ABS”
     b. List types of Supplemental Restraint Systems
     c. List types of Traction Control Systems
     d. List types of Steering Stability Systems
  2. Security
     a. Distinguish Anti-theft system differences
- H. Body controller systems
  1. Review sensor data
  2. Manipulate special functions of body controllers
- I. Power train system
  1. Review system functions
  2. Study logic flow
  3. Input and Output systems
- J. Wiring Systems
  1. Evaluate schematics
     a. Study and read
  2. Draw common circuits
  3. Mock up common circuits
- K. Handling of hazardous waste materials
  1. Storage and handling of gasoline
  2. Storage and handing of diesel fuel
  3. Handling of aerosol products
- L. 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. **Lab** - Student Hands-on laboratory activities and assignments
- C. **Lecture** -
- D. **Discussion** -

VII. TYPICAL ASSIGNMENTS:

A. Chapter Review 1. Oral presentations, demonstrations on the subject matter 2. Student Lab work sheets with emphasis on Hands-on applications 3. Review of Lab sheets in both Lab and class settings 4. Text reading assignments 5. Class discussions of reading assignments 6. Demonstrations pertaining to reading assignments

VIII. EVALUATION:
- A. **Methods**
  1. Exams/Tests
  2. Quizzes
  3. Class Participation
  4. Home Work
  5. Lab Activities
  6. Class Performance
- B. **Frequency**

IX. TYPICAL TEXTS:
1. Hollembeak, Barry, *Automotive Electricy and Electronics Classroom Manual.* 3rd edition ed., : Thomson Delmar Learning, 2005.
2. Hollembeak,Barry *Automotive Electricy and Electronics Shop Manual.* 3rd edition ed., Thomson Delmar Learning, 2005.
3. Safety Glasses worn while in Lab or performing Lab assignments

X. OTHER MATERIALS REQUIRED OF STUDENTS: