Course Modification Summary

Course ID Number: AUTO 061

Course Description: Principles of electricity, semiconductors and solid-state electronics, electrical test instruments, instrument panel and gauges, lighting systems, electrical circuits, instrument panel and accessories, passive restraint systems, body computers, and miscellaneous accessories. This course may be used in preparation for the Automotive Service Excellence (ASE) National Test.

Rationale: Deleting the repeatability (#3) on AUTO 061 to conform with the current curriculum requirements.

Rewriting the course description to reflect the latest changes in technology.

Last updated: 10/98

SAN BERNARDINO VALLEY COLLEGE
COURSE OUTLINE

I. CATALOG DESCRIPTION:
Division: TECHNICAL Department: AUTOMOTIVE
Course ID Number: AUTO 061
Course Title: Automotive Electrical & Electronic Systems
Hours: Lecture 3 Hours/Week
Units: 3
Course Description: Principles of electricity, semiconductors and solid-state electronics, electrical test instruments, instrument panel and gauges, lighting systems, electrical circuits, instrument panel and accessories, passive restraint systems, body computers, and miscellaneous accessories. This course may be used in preparation for the Automotive Service Excellence (ASE) National Test.
Prerequisite(s)/Corequisite(s): None

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

III. EXPECTED OUTCOMES FOR STUDENTS:
Upon completion of this course, students will be able to:
A. Explain the principles of automotive electricity and electronics.
B. Read and analyze automotive electrical wiring diagrams.
C. Interpret automotive test instrument readings.
D. Explain the principles and operation of instrument panels and gauges (analog and digital).
E. Describe the principles and operation of automotive lighting systems.
F. Explain the principles and operation of horn and windshield wiper/washer systems.
G. Describe the principles and operation of body computer systems and miscellaneous electrical accessories.
H. Apply knowledge and skills attained to pass the Automotive Service Excellence (ASE) National Test.

IV. CONTENT:
A. Basic Electricity and Basic Circuits
1. Atomic structure
2. Electron flow (current)
3. Voltage
4. Resistance to current flow
5. Ohm's law
6. Series circuit
7. Parallel circuits
8. Series-parallel circuits
9. Watts-electric power
10. Capacitance
B. Automotive Computer Systems
1. What is a computer?
2. Analog and digital systems

3. Digital logic
4. Computer programs
5. Parts of a computer
6. Instrumentation and control systems
7. Control system operating modes
8. Introduction to transducers

C. Automotive Wiring and Basic Circuit Components
1. Wiring and harnesses
2. Wire types and materials
3. Wire size
4. Special wiring
5. Connectors and terminals
6. Ground paths
7. Electrical system polarity
8. Common electrical parts

D. Introduction to Electrical Circuit Diagrams
1. Color coding
2. Diagrams

E. Lighting Systems
1. Headlamp circuits
2. Common automotive bulbs
3. Taillamp, license plate lamp, and parking lamp circuits
4. Stop lamp and turn signal circuits
5. Hazard warning lamp (emergency flasher) circuits
6. Backup lamp circuits
7. Side marker and clearance lamp circuits
8. Instrument panel and interior lamp circuits

F. Horn, Wiper and Washer, Cooling Fan, and Instrument Circuits
1. Horn circuits
2. Windshield wipers and washers
3. Cooling fan circuits
4. Electromagnetic instrument circuits
5. Electronic instrument circuits

G. Electrical Accessories (Body Electrical Systems)
1. Heating and air conditioning systems
2. Radios and sound systems
3. Rear window defogger and defroster
4. Heated windshield
5. Power windows
6. Power seats
7. Power door locks, trunk latches, and seat back release
8. Theft deterrent systems

V. METHODS OF INSTRUCTION:
The methods of instruction will include, but are not limited to, classroom lecture; classroom discussion; video presentations; filmstrips; and overhead projector. Students will demonstrate college level writing competency by writing a comprehensive report on a selected automotive electrical system.

VI. TYPICAL ASSIGNMENTS:

A. Read assigned chapters and answer questions at the end of each chapter.
   Typical Questions:
   1. Describe the operation of the field-effect transistor.
   2. Describe the difference between analog and digital signals.

B. Trace the flow of current from a voltage source to a named accessory using a manufacturer's service manual wiring diagram.

C. Reports on a selected automotive electrical component.

VII. EVALUATION:

A. Methods of Evaluation:
   1. Oral and written tests
   2. Graded reports
   3. Comprehensive written final exam
      Typical Questions:
      a. Identify the major parts of an alternator.
      b. Describe current and voltage regulation.

B. Frequency of Evaluation:
   1. Minimum of four (4) tests
   2. Minimum of two (2) written reports
   3. One (1) final examination

VIII. TYPICAL TEXT(S):

Title: Automotive Electrical & Electronics Systems
Author: Chek-Chart
Publisher: Harper & Row
Date of Publication: 1994

IX. OTHER SUPPLIES REQUIRED OF STUDENTS: None