San Bernardino Valley college
Curriculum Approved: November 17, 2003
Last Updated: September 2003

I. CATALOG DESCRIPTION:

A. Department Information:

Division:	Technical
Department:	Automotive
Course ID:	AUTO 065
Course Title:	Electrical Accessory Diagnostic
Units:	4
Lecture:	3 Hours
Laboratory:	3 Hours
Prerequisite:	None

B. Catalog and Schedule Description:
Principles of automotive electricity and electronics systems covering the use of a digital multi-meter, lighting, gauges, accessories, electronics, automotive body computers and solid-state devices, and communication systems. This course along with AUTO 064 will prepare students for ASE A-6 certification test.

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

III. EXPECTED OUTCOMES FOR STUDENTS:

Upon successful completion of the course, the student will be able to:

A. Identify safety requirements and recognize safety signs and symbols.
B. Apply logical and systematic approaches to analyze, repair, test, trouble-shoot microprocessor circuits, lighting, gauges, and accessories.
C. Describe the types of automotive computer input and output signals.
D. Diagnose and repair malfunctions in electrical and electronic components.
E. Interpret schematics in order to recognize problems and to work toward their solutions.
F. Choose the appropriate types of instrument and test equipment, apply industry standards for precision, accuracy, and tolerance.

IV. COURSE CONTENT:

A. Shop Safety
   1. Hazardous Materials
   2. Material Safety Data Sheets
   3. Machinery Hazards
B. Electromagnetic Devices
   1. Magnetism and Electromagnetism
   2. Electromagnetic Induction
C. Electrical Diagnosis
   1. Electrical Schematics and Wiring Diagrams (Reference Materials)
   2. Diagnostic Strategy, Graphs, Charts, and Technical Information
   3. Test Equipment, High-Impedance Test Light, Jumper Wires, Noid Lights, Digital Multi-meter, and Scan Tools
D. Lighting System Diagnosis
   1. Switches and Sending Units
   2. Warning Lights
   3. Gauges
   4. Speedometers
   5. Tachometer
   6. Electronics Instrument Panels
   7. Troubleshooting
E. Automotive Electronics
   1. Solid-State Devices

2. Diodes and Transistors
3. Microprocessors
4. Input and Output Devices

F. Body Computer Systems
1. Cruise Control System
2. Supplemental Restraint System
3. Radios and Entertainment Systems

G. Module Communication
1. Module Communication
2. Data Link Connectors

H. Diagnosis and Testing
1. Diagnostic Thought Process
2. Testing Process
3. Oscilloscopes

V. METHODS OF INSTRUCTION:

A. Lecture
B. Computer assisted instruction and shop manuals
C. Class and group discussion
D. Manufacturer's video instruction
E. Daily lab demonstrations

VI. TYPICAL ASSIGNMENTS:

A. Read assigned chapters and answer questions at the end of each chapter
Typical Question:
What is a logic circuit?

B. Class discussion:
Typical Topic:
Uses of a Body Control Module

C. Videotapes:
Typical Assignment:
Take notes, outline key points of discussion

D. Lab assignments:
Complete task sheets as per NATEF standards
Typical Assignments:
1. Use wiring diagrams during diagnosis of electrical circuit problems.
2. Inspect and test connectors, wire, and printed circuit boards of gauge circuits; determine necessary action.
3. Diagnosis incorrect operation of cruise control system; repair as needed.

VII. EVALUATION(S):

A. Methods of evaluation:
1. Review questions
2. Quizzes (Multiple Choice, Essay, and True/False)
3. Mid-term examination (Multiple Choice)
4. Final examination (Multiple Choice and Essay)
Typical Questions:
a) Name and describe the three types of headlamps use on today's cars.
b) Name the two types of solenoid-shift starters and describe their primary difference.
5. Assigned lab task as per NATEF standards (A – 6 Sections E, F, G, H)
NATEF A – 6 Electrical/Electronic System
Section E: Lighting Systems Diagnosis and Repair, Task 1-3
Typical Task:
Inspect and diagnose incorrect turn signal or hazard light operation; perform necessary action.

Section F: Gauges, Warning Devices, and Driver Information Systems Diagnosis and Repair, Task 1-4
Typical Task:
Inspect and test sensors, connectors, and wires of electronic instrument circuits; determine necessary action.

Section G: Horn and Wiper Diagnosis and Repair, Task 1-3
Typical Task:
Diagnose incorrect horn operation; perform necessary action.

Section H: Accessories Diagnosis and Repair, Task 1-6
Typical Task:
Diagnose incorrect heated glass operation; determine necessary action.

B. Frequency of evaluation
1. One mid-term examination
2. One final examination
3. Weekly quizzes
4. Bi-weekly text book chapter review questions
5. Daily NATEF task assignments (Lab)

VIII. TYPICAL TEXT(S):

Chek-Chart Publications, Automotive Electrical & Electronic System, 4th Edition, Columbus, Ohio: Prentice Hall, 2000

Barry Hollembeak, Automotive Electricity & Electronics, 2nd Edition, Rochester Hills, Michigan: Delmar Publishers, 2000

James E. Duffy, Auto Electricity and Electronics Technology, Tinley Park, Illinois: Goodheart-Willcox Company, 1999

William H. Crouse, Automotive Electronics and Electrical Equipment, 10th Edition, New York, New York, McGraw-Hill Book Company, 1998

Instructional Materials Laboratory, Automotive Technology Curriculum, 2001 Edition CD ROM, Columbia, Missouri, 2001

IX. OTHER SUPPLIES REQUIRED OF STUDENTS:

Safety equipment and adequate clothing