

Course Syllabus

A6 Electricity/Electronics

A Secondary-Level Course for Students Interested in Careers

Related to Automotive Electricity and Electronics

This course links occupational and academic pedagogy and is built on Integrated Curriculum

Standards. These standards *incorporate state and national academic, occupational, and employability standards.*

XII. Outline of Course Content

1) Basic Electricity

- a) Electrical Fundamentals
 - i) Basic Electrical Concepts
 - ii) Chemical Bonding
- b) Conductors and Insulators
- c) Characteristics of Electricity (Current, Voltage, and Resistance)
 - i) Units of Measurement
 - ii) Measurement Tools
- d) Introduction to the Digital Multimeter (DMM)
- e) The Complete Electrical Circuit
- f) Using the DMM
- g) Ohm's Law
 - i) Basic Mathematics and Formulas
 - ii) Mathematics for Science
- h) Series and Parallel Circuits
- i) Circuit Protection and Circuit Faults

2) Electrical/Magnetic Components

- a) Magnetism and Electromagnetism
- b) Electromagnetic Load Devices
- c) Magnetic (Electromagnetic) Induction

3) Electrical Diagnosis

- a) Reading Electrical Schematics and Wiring Diagrams
 - i) Blueprints and Diagrams
 - ii) Reference Materials
- b) Diagnosis Strategy

- i) Diagnosis
- ii) Graphs and Charts for Technical Information
- iii) Reference Materials
- iv) Shop Safety
- v) General Housekeeping
- c) Test Equipment and Special Tools
 - i) High-Impedance Test Light
 - ii) Jumper Wires/No-Id Light
 - iii) DMM
 - iv) Scan Tool
- d) Horn and Wiper/Washer Diagnosis and Repair

4) Battery Diagnosis and Service

- a) Battery Operation
- b) Battery Service
- c) Battery Diagnosis

5) Charging System Diagnosis and Service

- a) Charging System Operation
- b) Charging System Diagnosis
- c) Charging System Service

6) Starting System

- a) Starting System Operation
- b) Starting System Diagnosis
- c) Starting System Service

7) Automotive Wiring and Wire Service

- a) Inspection of Wiring
 - i) Soldering
 - ii) Chemical Reactions

8) Lighting Systems Diagnosis and Repair

- a) Operation
 - i) Headlights
 - ii) Headlight Switching Circuits
 - iii) Taillight Circuits
 - iv) Interior Lights
- b) Lighting Systems Diagnosis

9) Gauges and Warning Devices Diagnosis and Repair

- a) Switches and Sending Units
- b) Warning Lights
- c) Gauges
- d) Speedometers
- e) Tachometer

- f) Electronic Instrument Panel
- g) Troubleshooting

10) *Miscellaneous Systems Diagnosis and Repair*

- a) Accessories Diagnosis and Repair

11) *Mentor Module*

- a) Workplace Interpersonal Skills
 - i) Teamwork
 - ii) Management of Self-Expression
 - iii) Customer Relations
- b) Work Journal
 - i) Problem Solving and Decision Making
 - ii) Teaching Techniques
 - iii) Task Lists
- iv) Career Information and Development

12) *Automotive Electronics*

- a) Solid-State Devices
- b) Diodes and Transistors
- c) Microprocessors
- d) Input Devices
- e) Output Devices

13) *Body Computer Systems*

- a) Cruise Control Systems
- b) Supplemental Restraint System (SRS)
- c) Radios and Entertainment Systems

14) *Vehicle Communication*

- a) Module Communication
- b) Data Link Connector (DLC)
 - i) Scan Tools
- c) Cellular Phone Systems

15) *Diagnosis and Testing*

- a) Diagnostic Thought Process
- b) Testing Process
- c) Oscilloscopes