

# **COCONINO COMMUNITY COLLEGE**

## **COURSE OUTLINE**

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Status: Permanent

Date: Sept. 2, 2004

A. Identification:

1. Subject Area: Automotive Technology
2. Course Number: AUT 110
3. Course Title: Automotive Electrical and Electronic Systems
4. Credit Hrs: 3
5. Catalog Description:

A study of automotive electrical and electronic systems used on light and medium duty vehicles. Topics include Principles of Electrical/Electronic Systems, General Electrical System Diagnosis and Battery Diagnosis and Service. Pre or Co-requisites: AUT 100. Two lecture. Two lab. May be taken for S/U credit.

B. Course Goals:

To introduce students to the theory, design, testing and analysis of automotive and light truck electrical and electronic systems. Topics will include: Principles of Electrical/Electronic Systems, General Electrical System Diagnosis and Battery Diagnosis and Service.

C. Course Outcomes:

Students will:

1. Identify and interpret electrical/electronic system concern; determine necessary action.
2. Research applicable vehicle and service information, such as electrical/electronic system operation, vehicle service history, service precautions, and technical service bulletins.
3. Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, and calibration decals).
4. Diagnose electrical/electronic integrity for series, parallel and series-parallel circuits using principles of electricity (Ohm's Law).
5. Use wiring diagrams during diagnosis of electrical circuit problems.
6. Demonstrate the proper use of a digital multimeter (DMM) during diagnosis of electrical circuit problems.
7. Check electrical circuits with a test light; determine necessary action.
8. Measure source voltage and perform voltage drop tests in electrical/electronic circuits using a voltmeter; determine necessary action.
9. Measure current flow in electrical/electronic circuits and components using an ammeter; determine necessary action.
10. Check continuity and measure resistance in electrical/electronic circuits and components using an ohmmeter; determine necessary action.

11. Check electrical circuits using fused jumper wires; determine necessary action.
12. Locate shorts, grounds, opens, and resistance problems in electrical/electronic circuits; determine necessary action.
13. Measure and diagnose the cause(s) of excessive key-off battery drain (parasitic draw); determine necessary action.
14. Inspect and test fusible links, circuit breakers, and fuses; determine necessary action.
15. Inspect and test switches, connectors, relays, solid state devices, and wires of electrical/electronic circuits; perform necessary action.
16. Repair wiring harnesses and connectors.
17. Perform solder repair of electrical wiring.
18. Perform battery state-of-charge test; determine necessary action.
19. Perform battery capacity test; confirm proper battery capacity for vehicle application; determine necessary action.
20. Maintain or restore electronic memory functions.
21. Inspect, clean, fill, and replace battery.
22. Perform slow/fast battery charge.
23. Inspect and clean battery cables, connectors, clamps, and hold-downs; repair or replace as needed.
24. Start a vehicle using jumper cables and a battery or auxiliary power supply.

D. Course Content:

Will include:

Besides the above performance competencies course content will also include:

1. General Electrical System Diagnosis
2. Battery Diagnosis and Service
3. Principles of Electrical/Electronic Systems