

# Minnesota State College Southeast

## **AUTO 1126: Auto Electrical/Electronic Lab**

### **A. COURSE DESCRIPTION**

Credits: 2

Lecture Hours/Week: \*.\*

Lab Hours/Week: 4

OJT Hours/Week: \*.\*

Prerequisites: None

Corequisites: None

MnTC Goals: None

This course covers the diagnosis and repair techniques of auto body electrical and electronic systems. It involves electrical/electronic systems such as power windows, power seats, electronic instrument clusters, theft deterrent systems, computer controlled electronics, and passive restraint systems. The following TASKS are required by NATEF (National Automotive Technician Education Foundation). NATEF requires that 95% of P-1's, 80% of P-2's, and 50% of P-3's be completed during the course. (Prerequisites: AUTO1105, AUTO1106, AUTO1216 or instructor approval) (2 Credits: 0 lecture/2 lab)

**B. COURSE EFFECTIVE DATES:** 10/05/1998 - Present

### **C. OUTLINE OF MAJOR CONTENT AREAS**

1. Safety Requirements
2. General Electrical System Diagnosis
3. Lighting Systems Diagnosis and Repair
4. Gauges, Warning Devices, and Driver Information Systems Diagnosis and Repair
5. Horn and Wiper/Washer Diagnosis and Repair
6. Accessories Diagnosis and Repair

**D. LEARNING OUTCOMES (General)**

1. Comply with personal and environmental safety practices associated with Clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.
2. Identify and interpret electrical/electronic system concern; determine necessary action. P-1
3. Research applicable vehicle and service information, such as electrical/electronic system operation, vehicle service history, service history, service precautions, and technical service bulletins. P-1
4. Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, and calibration decals). P-1
5. Diagnose electrical/electronic integrity for series, parallel and series-parallel circuits using principles of electricity (Ohm's Law). P-1
6. Use wiring diagrams during diagnosis of electrical circuit problems. P-1
7. Demonstrate the proper use of a digital multimeter (DMM) during diagnosis of electrical circuit problems. P-1
8. Check electrical circuits with a test light; determine necessary action. P-2
9. Measure source voltage and perform voltage drop tests in electrical/electronic circuits using a voltmeter; determine necessary action. P-1
10. Measure current flow in electrical/electronic circuits and components using an ammeter; determine necessary action. P-1
11. Check continuity and measure resistance in electrical/electronic circuits and components using an ohmmeter; determine necessary action. P-1
12. Check electrical circuits using fused jumper wires; determine necessary action. P-2
13. Locate shorts, grounds, opens, and resistance problems in electrical/electronic circuits; determine necessary action. P-1
14. Measure and diagnose the cause(s) of excessive key-off battery drain (parasitic draw); determine necessary action. P-1
15. Inspect and test fusible links, circuit breakers, and fuses; determine necessary action. P-1
16. Inspect and test switches, connectors, relays, solid state devices, and wires of electrical/electronic circuits; perform necessary action. P-1
17. Repair wiring harnesses and connectors. P-1
18. Perform solder repair of electrical wiring. P-1
19. Diagnose the cause of brighter than normal, intermittent, dim, or no light operation; determine necessary action. P-1
20. Inspect, replace, and aim headlights and bulbs. P-2
21. Inspect and diagnose incorrect turn signal or hazard light operation; perform necessary action. P-2
22. Inspect and test gauges and gauge sending units for cause of intermittent, high, low, or no gauge readings; determine necessary action. P-1
23. Inspect and test connectors, wires, and printed circuit boards of gauge circuits; determine necessary action. P-3
24. Diagnose the cause of incorrect operation of warning devices and other driver information systems; determine necessary action. P-1
25. Inspect and test sensors, connectors, and wires of electronic instrument circuits; determine necessary action. P-2
26. Diagnose incorrect horn operation; perform necessary action. P-2
27. Diagnose incorrect wiper operation; diagnose wiper speed control and park problems; perform necessary action. P-2
28. Diagnose incorrect washer operation; perform necessary action. P-2
29. Diagnose incorrect operation of motor-driven accessory circuits; determine necessary action. P-2
30. Diagnose incorrect heated glass operation; determine necessary action. P-3
31. Diagnose incorrect electric lock operation; determine necessary action. P-2

32. Diagnose incorrect operation of cruise control systems; determine necessary action. P-3
33. Diagnose supplemental restraint system (SRS) concerns; determine necessary action. (Note: Follow manufacture's safety procedures to prevent accidental deployment.) P-2
34. Disarm and enable the airbag system for vehicle service. P-1
35. Diagnose radio static and weak, intermittent, or no radio reception; determine necessary action. P-3
36. Remove and reinstall door panel. P-1
37. Diagnose body electronic system circuits using a scan tool; determine necessary action. P-2
38. Check for module communication errors using a scan tool. P-3
39. Diagnose the cause of false, intermittent, or no operation of anti-theft system. P-2
40. Perform electrical/electronic safety procedures
41. Maintain an orderly work area
42. Exhibit professionalism

**E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

None

**F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

**G. SPECIAL INFORMATION**

None noted