



## AUTOMOTIVE ELECTRONICS 1 — AUTM 2117

### A. Course Description

- **Credits:** 3.00
- **Lecture Hours/Week:** 1.00
- **Lab Hours/Week:** 2.00
- **OJT Hours/Week:** 0
- **Prerequisites:** None
- **Corequisites:** None
- **MnTC Goals:** None

This course covers automotive electrical and electronic fundamentals. Operation, diagnosis, and repair of automotive lighting, horn, relay, and windshield wiper circuits are studied using various types of tools and test equipment. Reference materials available through Alldata, Mitchell, Identifix, AC Delco, Subaru of America and the student textbook will be utilized.

Prerequisites: AUTM 1003, 1013

### B. Course Effective Dates: 8/21/17 – Present

### C. Outline of Major Content Areas

1. 1) Electrical Fundamentals
2. 2) Electronics Fundamentals
3. 3) Horn and Relay Circuits
4. 4) Lighting Circuits
5. 5) Windshield Wiper systems

### D. Learning Outcomes

1. 1. Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins.
2. 10. Replace electrical connectors and terminal ends.
3. 11. Inspect interior and exterior lamps and sockets including headlights and auxiliary lights (fog lights/driving lights); replace as needed.
4. 12. Diagnose the cause of brighter than normal, intermittent, dim, or no light operation; determine necessary action
5. 13. Identify system voltage and safety precautions associated with high intensity discharge headlights
6. 14. Inspect and diagnose incorrect turn signal or hazard light operation; perform

necessary action

7. 15. Inspect, replace, and aim headlights and bulbs
8. 16. Diagnose incorrect horn operation; perform necessary action
9. 17. Diagnose incorrect relay circuit operation; perform necessary action
10. 18. Diagnose incorrect wiper operation; diagnose wiper speed control and park problems; perform necessary action
11. 19. Diagnose incorrect windshield washer operation; perform necessary action
12. 2. Demonstrate knowledge of electrical/electronic series, parallel, and series- parallel circuits using principles of electricity (Ohm's Law).
13. 20. Check for module communication (LAN/CAN/BUS) errors using a scan tool
14. 21. Diagnose body electronic system circuits using a scan tool; determine necessary action
15. 22. Disarm and enable the air bag system for vehicle service
16. 23. Remove and reinstall door panel
17. 3. Use wiring diagrams to trace electrical/electronic circuits.
18. 4. Demonstrate proper use of a digital Multimeter (DMM) when measuring source voltage, voltage drop (including grounds), current flow, and resistance.
19. 5. Demonstrate knowledge of the causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits.
20. 6. Check operation of electrical circuits with a test light.
21. 7. Check operation of electrical circuits with fused jumper wires.
22. 8. Inspect and test fusible links, circuit breakers, and fuses; determine necessary action.
23. 9. Perform solder repair of electrical wiring.

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

**F. Learner Outcomes Assessment**

As noted on course syllabus

**G. Special Information**

None noted

