

STATE UNIVERSITY OF NEW YORK %  
COLLEGE OF TECHNOLOGY %  
CANTON, NEW YORK %



**MASTER SYLLABUS**

**AUTO 212-AUTOMOTIVE ELECTRICAL SYSTEMS**

**Created by: Brandon Baldwin**  
**Updated by: Brandon Baldwin**

**SCHOOL OF ENGINEERING TECHNOLOGY %**  
**AUTOMOTIVE TECHNOLOGY %**  
**SPRING 2018 %**

A. % **TITLE:** Automotive Electrical Systems II

B. % **COURSE NUMBER:** AUTO 212

C. % **CREDIT HOURS:** (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

# Credit Hours: 4 !

# Lecture Hours: 3 per week %

# Lab Hours: 3 per week %

Other: per week

Course Length: 15 Weeks

D. **WRITING INTENSIVE COURSE:** NO

E. **GER CATEGORY:**

F. **SEMESTER(S) OFFERED:** Spring

G. **COURSE DESCRIPTION:** This course begins where Automotive Electrical Systems terminates. Topics covered include lighting, gauges, warning devices, driver information systems, horn and wiper operations, and electrical accessory diagnosis and repair.

H. % **PRE-REQUISITES/CO-REQUISITES:**

a. Pre-requisite(s): AUTO 112-Automotive Electrical Systems

b. Co-requisite(s): AUTO 214-Automotive Computer Systems

I. % **STUDENT LEARNING OUTCOMES:**

<b><u>Course Student Learning Outcome [SLO]</u></b>	<b><u>PSLO</u></b>	<b><u>GER</u></b>	<b><u>ISLO</u></b>
Apply electrical knowledge to diagnose the cause of brighter than normal, intermittent, dim, or no light operation.	ALO1, ALO2, ALO3		2. Critical Thinking 5. Industry, Professional, Discipline Specific Knowledge and Skills
Inspect, replace, and aim headlights and bulbs.	ALO1, ALO2, ALO3		2. Critical Thinking 5. Industry, Professional, Discipline Specific Knowledge and Skills
Apply electrical knowledge to diagnose incorrect turn signal or hazard light operation	ALO1, ALO2, ALO3		2. Critical Thinking 5. Industry, Professional, Discipline Specific Knowledge and Skills
Apply electrical knowledge to test gauges and gauge sending units for cause of intermittent, high, low, or no gauge readings.	ALO1, ALO2, ALO3		2. Critical Thinking 5. Industry, Professional, Discipline Specific Knowledge and Skills
Apply electrical knowledge to test connectors, wires, and printed circuit boards of gauge circuits.	ALO1, ALO2, ALO3		2. Critical Thinking 5. Industry, Professional, Discipline Specific Knowledge and Skills
Apply electrical knowledge to diagnose the cause of incorrect	ALO1, ALO2, ALO3		2. Critical Thinking

operation of warning devices and other driver information systems.			5. Industry, Professional, Discipline Specific Knowledge and Skills
Apply electrical knowledge to test sensors, connectors, and wires of electronic instrument circuits.	ALO1, ALO2, ALO3		2. Critical Thinking 5. Industry, Professional, Discipline Specific Knowledge and Skills
Apply electrical knowledge to diagnose incorrect horn operation.	ALO1, ALO2, ALO3		2. Critical Thinking 5. Industry, Professional, Discipline Specific Knowledge and Skills
Apply electrical knowledge to diagnose incorrect wiper operation; diagnose wiper speed control and park problems.	ALO1, ALO2, ALO3		2. Critical Thinking 5. Industry, Professional, Discipline Specific Knowledge and Skills
Apply electrical knowledge to diagnose incorrect washer operation.	ALO1, ALO2, ALO3		2. Critical Thinking 5. Industry, Professional, Discipline Specific Knowledge and Skills
Apply electrical knowledge to diagnose incorrect operation of motor-driven accessory circuits.	ALO1, ALO2, ALO3		2. Critical Thinking 5. Industry, Professional, Discipline Specific Knowledge and Skills
Apply electrical knowledge to diagnose incorrect heated glass operation.	ALO1, ALO2, ALO3		2. Critical Thinking 5. Industry, Professional, Discipline Specific Knowledge and Skills
Apply electrical knowledge to diagnose incorrect electric lock operation.	ALO1, ALO2, ALO3		2. Critical Thinking 5. Industry, Professional, Discipline Specific Knowledge and Skills
Apply electrical knowledge to diagnose incorrect operation of cruise control systems.	ALO1, ALO2, ALO3		2. Critical Thinking 5. Industry, Professional, Discipline Specific Knowledge and Skills
Apply electrical knowledge to diagnose supplemental restraint system (SRS) concerns.	ALO1, ALO2, ALO3		2. Critical Thinking 5. Industry, Professional, Discipline Specific Knowledge and Skills

KEY	<b><u>Institutional Student Learning Outcomes [ISLO 1 – 5]</u></b>
ISLO #	<b>ISLO &amp; Subsets</b>
<b>1</b>	<b>Communication Skills</b> Oral [O], Written [W]
<b>2</b>	<b>Critical Thinking</b> <i>Critical Analysis [CA], Inquiry &amp; Analysis [IA], Problem Solving [PS]</i>
<b>3</b>	<b>Foundational Skills</b> <i>Information Management [IM], Quantitative Lit./Reasoning [QTR]</i>
<b>4</b>	<b>Social Responsibility</b> <i>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</i>
<b>5</b>	<b>Industry, Professional, Discipline Specific Knowledge and Skills</b>

J. % **APPLIED LEARNING COMPONENT:** Yes   x   No           

K. **TEXTS:** Diagnosis and Trouble Shooting of Automotive Electrical, Electronic, and Computer Systems by James Halderman. Automotive Electricity, NATEF Standards Job Sheets, by Erjavec

L. % **REFERENCES:** Manufacturer Service Manuals, Alldata, ShopKeyPro, Subaru STIS

M. % **EQUIPMENT:** student tool box, Snap-On electrical trainers.

N. % **GRADING METHOD:** A-F

O. % **SUGGESTED MEASUREMENT CRITERIA/METHODS:** exams, quizzes, homework, class participation, lab practical, and lab performance.

**P. DETAILED COURSE OUTLINE:**

I. Review of Electrical Fundamentals

1. Ohm's Law
2. Series Circuits
3. Parallel Circuits
4. Series/Parallel Circuits
5. Wiring Diagrams
6. Electrical Components
7. Battery, Starting, and Charging Systems

II. Lighting Systems !

- Multiple incandescent bulb operation and diagnosis !
- LED operation and diagnosis !
- HID headlight safety and voltage !

III. Gauges, Warning Devices, and Driver Information Centers !

- Instrument Panel device operation and diagnosis !
- Circuit board operation and diagnosis !
- Sensor testing !

IV. Horn and Wiper Systems !

- Horn operation !
- Base wiper operation !
- Intermittent wiper operation !
- Rain sense wiper operation !
- Washer systems, front and rear !

V. Accessories

1. Motor driven accessories
  - a. Power mirrors

- b. Power seats
- c. Power locks
- d. Vent windows
- e. Blowers
- f. Hidden headlights
- 2. Heated glass
- 3. Cruise control systems
- 4. Supplemental restraint systems
- 5. Radios/sound systems
- 6. Door panel controls/door panel remove and install
- 7. Scan tool diagnostics of body controls

## VI. Driver Information & Navigation Systems

### Q. **LABORATORY OUTLINE:**

#### I. Review of Electrical I

- 1. Measurement
- 2. Building circuits
- 3. Practice on vehicles

#### II. Lighting Systems

- Multiple incandescent bulb operation and diagnosis
- LED operation and diagnosis
- HID headlight safety and voltage

#### III. Gauges, Warning Devices, and Driver Information Centers

- Instrument Panel device operation and diagnosis
- Circuit board operation and diagnosis
- Sensor testing

#### IV. Horn and Wiper Systems !

- Horn operation !
- Base wiper operation !
- Intermittent wiper operation !
- Rain sense wiper operation !
- Washer systems, front and rear !

#### V. Accessories

- 1. Motor driven accessories
  - a. Power mirrors
  - b. Power seats
  - c. Power locks
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  - f. Hidden headlights
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- 6. Door panel controls/door panel remove and install
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## VI. Driver Information & Navigation Systems