

JEFFERSON COLLEGE

COURSE SYLLABUS

AUT221

ADVANCED ELECTRICAL/ELECTRONICS SYSTEMS

2 Credit Hours

Prepared by: Gary Boyher
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Revised by: Brad Berrey
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AUT221 Advanced Electrical/Electronics Systems

I. CATALOGUE DESCRIPTION

- A. Pre-requisite: AUT211 Advanced Engine Performance with a Grade of “C” or Better
 AUT212 Advanced Engine Performance Lab with a Grade of “C” or Better
 Reading Proficiency
 Co-requisite: AUT222 Advanced Electrical/Electronics Systems Lab
- B. 2 Credit Hours
- C. Advanced Electrical/Electronics Systems will cover the theory and operation of lighting system, gauges, warning devices, driver information center, horn, washer, wiper, and accessory diagnosis and repair. Completion of this course will prepare the student for employment in the automotive field and take the National Institute for Automotive Service Excellence (ASE) Electrical/Electronic Systems Test (A6), Engine Performance Test (A8), and Advanced Engine Performance Specialist Certification Test (L1). (S)

II. EXPECTED LEARNING OUTCOMES/CORRESPONDING ASSESSMENT MEASURES

A. Lighting Systems Diagnosis and Repair		
Demonstrate understanding of the cause of brighter than normal, intermittent, dim, or no light operation; determine necessary action	P-1	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests
Demonstrate understanding of inspecting, replacing, and aiming headlights and bulbs	P-2	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests
Demonstrate understanding of inspecting and diagnosing incorrect turn signal or hazard light operation; perform necessary action	P-2	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests

Demonstrate understanding of identifying system voltage and safety precautions associated with high intensity discharge headlights	P-2	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests
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B. Gauges, Warning Devices, and Driver Information Systems Diagnosis and Repair

Demonstrate understanding of inspecting and testing gauges and gauge sending units for cause of abnormal gauge readings; determine necessary action	P-1	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests
Demonstrate understanding of inspecting and testing connectors, wires, and printed circuit boards of gauge circuits; determine necessary action	P-3	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests
Demonstrate understanding of diagnosing the cause of incorrect operation of warning devices and other driver information systems; determine necessary action	P-1	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests
Demonstrate understanding of inspecting and testing sensors, connectors, and wires of electronic (digital) instrument circuits; determine necessary action	P-3	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests

C. Horn and Wiper/Washer Diagnosis and Repair

Demonstrate understanding of diagnosing incorrect horn operation; perform necessary action	P-1	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests
Demonstrate understanding of diagnosing incorrect wiper operation; diagnose wiper speed control and park problems; perform necessary action	P-2	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests
Demonstrate understanding of diagnosing incorrect washer operation; perform necessary action	P-2	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests

D. Accessories Diagnosis and Repair		
Demonstrate understanding of diagnosing incorrect operation of motor-driven accessory circuits; determine necessary action	P-1	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests
Demonstrate understanding of diagnosing incorrect heated glass, mirror, or seat operation; determine necessary action	P-3	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests
Demonstrate understanding of diagnosing incorrect electric lock operation (including remote keyless entry); determine necessary action	P-1	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests
Demonstrate understanding of diagnosing incorrect operation of cruise control systems; determine necessary action	P-3	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests
Demonstrate understanding of diagnosing supplemental restraint system (SRS) concerns; determine necessary action	P-1	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests
Demonstrate understanding of disarming and enabling the airbag system for vehicle service	P-1	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests
Demonstrate understanding of diagnosing radio static and weak, intermittent, or no radio reception; determine necessary action	P-3	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests

Demonstrate understanding of removal and reinstallation of door panel	P-1	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests
Demonstrate understanding of diagnosing body Electronic system circuits using a scan tool; determine necessary action	P-2	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests
Demonstrate checking for module communication (including CAN/BUS systems) errors using a scan tool	P-2	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests
Demonstrate understanding of diagnosing the cause of false, intermittent, or no operation of anti-theft systems	P-3	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests
Demonstrate understanding of the operation of keyless entry/remote-start systems	P-3	Classroom Discussions Lectures Classroom Exercises Reading Assignments Written Tests

III. OUTLINE OF TOPICS

- A. Lighting System Diagnosis and Repair
 - 1. Discuss the causes of brighter than normal, intermittent, dim, or no light operation
 - 2. Explain routine maintenance and adjustments on lighting systems
 - 3. Describe inspecting and diagnosing improper functioning of lights

- B. Gauges, Warning Devices, and Driver Information Systems Diagnosis and Repair
 - 1. Describe inspecting and testing gauges and gauge sending units
 - 2. Explain incorrect operation of dash related systems
 - 3. Discuss proper repair

- C. Horn and Wiper/Washer Diagnosis and Repair
 - 1. Describe diagnosing incorrect horn operation
 - 2. Discuss incorrect wiper operation, wiper speed control, wiper park
 - 3. Explain incorrect washer operation

- D. Accessories Diagnosis and Repair
 - 1. Describe diagnosing incorrect motor driven accessory circuits
 - 2. Discuss diagnosing incorrect heated glass, mirror, and seat operation
 - 3. Explain diagnosing incorrect electric lock operation (including remote keyless entry)

IV. METHOD(S) OF INSTRUCTION

- A. Lecture
- B. Classroom Exercises
- C. Electude/Argo Online Curriculum
- D. Classroom Discussion

V. REQUIRED TEXTBOOK(S)

Al Santini, *Automotive Electricity & Electronics*, (Current Edition), Delmar

VI. REQUIRED MATERIALS

- A. Jefferson College Automotive Technology or Approved Sponsoring Shop Workshirt
- B. Safety Glasses
- C. Work Boots

VII. SUPPLEMENTAL REFERENCES

None

VIII. METHODS OF EVALUATION

- A. Tests 33 1/3%
- B. Classroom Assignments 33 1/3%
- C. Student Participation 33 1/3%

IX. ADA AA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Technology Center 101; phone 636-481-3169).

X. ACADEMIC HONESTY STATEMENT

All students are responsible for complying with campus policies as stated in the Student Handbook (see College Website <http://www.jeffco.edu>).

XI. ATTENDANCE STATEMENT

Regular and punctual attendance is expected of all students. Any one of these four options may result in the student being removed from the class and an administrative withdrawal being processed: (1) Student fails to begin class; (2) Student ceases participation for at least two consecutive weeks; (3) Student misses 15 percent or more of the coursework; and/or (4) Student misses 15 percent or more of the course as defined by the instructor. Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.

XII. OUTSIDE OF CLASS ACADEMICALLY RELATED ACTIVITIES

The U.S. Department of Education mandates that students be made aware of expectations regarding coursework to be completed outside the classroom. Students are expected to spend substantial time outside of class meetings engaging in academically related activities such as reading, studying, and completing assignments. Specifically, time spent on academically related activities outside of class combined with time spent in class meetings is expected to be a minimum of 37.5 hours over the duration of the term for each credit hour.