

JEFFERSON COLLEGE

COURSE SYLLABUS

AUT222

ADVANCED ELECTRICAL/ELECTRONICS SYSTEMS LAB

3 Credit Hours

Prepared by: Gary Boyher
Date: February 10, 2014

Revised by: Brad Berrey
Date: September, 26 2016

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AUT222 Advanced Electrical/Electronics Systems Lab

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: AUT221 Advanced Electrical/Electronics Systems
- B. 3 Credit Hours
- C. Advanced Electrical/Electronics Systems Lab will cover the diagnosis and repair of lighting systems, gauges, warning devices, driver information systems, horn and wiper operation, as well as accessory diagnosis and repair. This course covers the testing, diagnosis, and servicing of these systems in a shop environment. 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).
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II. EXPECTED LEARNING OUTCOMES/CORRESPONDING ASSESSMENT MEASURES

A. Lighting Systems Diagnosis and Repair		
Demonstrate knowledge of the cause of brighter than normal, intermittent, dim, or no light operation; determine necessary action	P-1	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback
Demonstrate knowledge of inspecting, replacing, and aim headlights and bulbs	P-2	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback
Demonstrate knowledge Inspect interior and exterior lamps and sockets including headlights and auxiliary lights (fog lights/driving lights); replace as needed	P-1	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback
Demonstrate knowledge of inspecting and diagnosing incorrect turn signal or hazard light operation; perform necessary action	P-2	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback

Demonstrate knowledge of identifying system voltage and safety precautions associated with high intensity discharge headlights	P-2	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback
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B. Gauges, Warning Devices, and Driver Information Systems Diagnosis and Repair		
Demonstrate knowledge of inspecting and testing gauges and gauge sending units for cause of abnormal gauge readings; determine necessary action	P-1	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback
Demonstrate knowledge of inspecting and testing connectors, wires, and printed circuit boards of gauge circuits; determine necessary action	P-3	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback
Demonstrate knowledge of diagnosing the cause of incorrect operation of warning devices and other driver information systems; determine necessary action	P-1	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback
Demonstrate knowledge of inspecting and testing sensors, connectors, and wires of electronic (digital) instrument circuits; determine necessary action	P-3	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback

C. Horn and Wiper/Washer Diagnosis and Repair		
Demonstrate knowledge of diagnosing incorrect horn operation; perform necessary action	P-1	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback
Demonstrate knowledge of diagnosing incorrect wiper operation; diagnose wiper speed control and park problems; perform necessary action	P-2	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback
Demonstrate knowledge of diagnosing incorrect washer operation; perform necessary action	P-2	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback

D. Accessories Diagnosis and Repair		
Demonstrate knowledge of diagnosing incorrect operation of motor-driven accessory circuits; determine necessary action	P-1	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback

Demonstrate knowledge of diagnosing incorrect electric lock operation (including remote keyless entry); determine necessary action	P-1	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback
Demonstrate knowledge of diagnosing supplemental restraint system (SRS) concerns; determine necessary action	P-1	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback
Demonstrate knowledge of disarming and enabling the airbag system for vehicle service	P-1	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback
Demonstrate knowledge of diagnosing radio static and weak, intermittent, or no radio reception; determine necessary action	P-3	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback
Demonstrate knowledge of removing and reinstalling door panel	P-1	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback
Demonstrate knowledge of diagnosing body electronic system circuits using a scan tool; determine necessary action	P-2	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback
Demonstrate knowledge of checking for module communication (including CAN/BUS systems) errors using a scan tool	P-2	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback
Demonstrate knowledge of diagnosing the cause of false, intermittent, or no operation of anti-theft systems	P-3	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback
Demonstrate knowledge of the operation of keyless entry/remote-start systems	P-3	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback
Demonstrate knowledge verify windshield wiper and washer operation, replace wiper blades	P-1	Performance of Task During Lab/Shop Class with 100% Accuracy Lab Exercises Instructor Observation/Feedback

III. OUTLINE OF TOPICS

- A. Lighting System Diagnosis and Repair
 - 1. Diagnose lighting circuits
 - 2. Perform routine maintenance on lighting circuits
 - 3. Locate proper service information

- B. Gauges, Warning Devices, and Driver Information Systems Diagnosis and Repair
 - 1. Inspect and test gauges and gauge sending units
 - 2. Inspect and test connectors, wires, and printed circuit boards
 - 3. Diagnose incorrect operation of warning devices and other driver information systems
 - 4. Inspect and test sensors, connectors, and wires of electronic instrument circuits

- C. Horn and Wiper/Washer Diagnosis and Repair
 - 1. Diagnose incorrect horn operation
 - 2. Diagnose incorrect wiper operation
 - 3. Diagnose incorrect washer operation

- D. Accessories diagnosis and repair
 - 1. Diagnose incorrect operation of motor driven accessory circuits
 - 2. Diagnose and perform maintenance on supplemental restraint system (SRS)
 - 3. Diagnose accessory circuits using industry accepted procedures
 - 4. Locate proper service information

IV. METHOD(S) OF INSTRUCTION

- A. Lab Exercises

- B. Electude/Argo Online Curriculum

- C. A-Tech Coursework

- D. Live Vehicle Repair

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. Student Participation 40%
- B. Shop Work 60%

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.