

SYLLABUS

DIVISION: BUSINESS & ENGINEERING TECHNOLOGIES

REVISED 2012

CURRICULA IN WHICH COURSE IS TAUGHT: AUTOMOTIVE ANALYSIS AND REPAIR

COURSE NUMBER AND TITLE: AUT 242 AUTOMOTIVE ELECTRICITY II

LECTURE 3 HOURS LABORATORY 3 HOURS CREDITS 4 HOURS

I. COURSE DESCRIPTION:

Introduces advanced electrical components and testing using digital meters and troubleshooting all types of automotive electrical systems.

II. RELATIONSHIP OF THE COURSE TO CURRICULUM OBJECTIVES:

Students will:

- I. Demonstrate technical competencies and skills in automotive electrical systems.
- II. Demonstrate punctuality and reliability acceptable to the automotive repair industry.
- III. Demonstrate an understanding of the economic costs of automobile vehicle repair.
- IV. Use safety equipment and procedures required for the operations being performed.
- V. Read and interpret technical information required for projects and assignments.
- VI. Demonstrate and maintain a clean, orderly, safe and attractive work place and maintain a personal appearance that will enhance that work place.

III. REQUIREMENTS:

Completion of AUT 241 or permission of the instructor

Course textbook must be available for use and study

A basic hand tool set must be available and work clothes must be worn in lab

A digital multimeter is required

IV. COURSE CONTENT:

Use of electric meters and digital multimeters

Alternator principles

Alternator construction, inspection and diagnosis

Starter principles

Alternator and starter inspection and diagnosis

Electronic component operation and construction

Interior and external lighting devices, circuitry and diagnosis

Indicating devices, circuitry and diagnosis

Electronic component related components

Troubleshooting of different types of electrical components and devices

Students will work to show competency in the performance of the following tasks:

ASE Task List

1. Using wiring diagrams to diagnose electrical circuit problems.
2. Check voltages and voltage drops of electrical circuits with DVOM.
3. Check current flow using an ammeter.
4. Check electric circuits using jumper wires.
5. Find shorts, grounds, opens and resistance problems in electric circuits.
6. Measure and diagnose key-off battery drain problems.
7. Maintain or restore electric memory functions.
8. Perform starter current draw and circuit voltage drop tests.
9. Inspect and test starter relays and solenoids.
10. Remove and replace or reinstall starter.
11. Perform starter bench tests.
12. Diagnose charging system problems.
13. Inspect and test alternator drive belts.
14. Inspect and test voltage regulator.
15. Remove, inspect and install alternator.
16. Disassemble, clean and inspect alternator.
17. Diagnose improper gauge readings.
18. Test gauge circuit voltage regulators.
19. Inspect and test gauges and sending units.
20. Inspect and test connectors, wires and circuit boards of gauge circuits.
21. Diagnose warning light and driver information system failures.
22. Diagnose false readings on electronic digital instrument clusters.
23. Inspect and test wiring, sensors, sending units or electronic digital instrument circuits.
24. Diagnose windshield wiper operation.
25. Diagnose windshield washer operation.
26. Diagnose motor-driven accessory circuit problems.
27. Diagnose heated glass system failures.
28. Diagnose electric door and trunk lock failures.
29. Diagnose cruise system failures.
30. Diagnose heating and A/C electrical control failures.
31. Inspect and test A/C and heating system electrical components.
32. Inspect and test power and ground circuits.
33. Interpret digital multimeter readings.
34. Practice recommended precautions when handling static sensitive devices.

V. LEARNER OUTCOMES:

1. Explain the use of a digital multimeter
2. Use electric meters and test light while diagnosing
3. Troubleshoot diagrams of alternators, generators, regulators and their electrical circuits.
4. Troubleshoot diagrams of the lighting circuits.
5. Identify the parts of an ignition system.
6. Diagnose alternator and starter problems.
7. Explore diagrams of the indicating devices and circuits.
8. Complete units on electrical simulators

VI. Evaluation:

Evaluated by written tests and simulator troubleshooting (problem solving, diagramming, T or F, short answer.)

by laboratory practice (shop instructor observation)

1. Use test meters to measure values of electrical circuits.
2. Remove and install alternators, generators, regulators, ignition components and lighting components.
3. Rebuild alternators and starters.
4. Adjust ignition timing.
5. Replace electrical wiring.
6. Repair electrical wiring.
7. Apply electrical wiring diagrams while solving electrical malfunctions.
8. Work with setting up and troubleshooting electrical simulation equipment
9. 75% of students will be able to complete these assignments

VII. The Following General Education Objectives Will Be Addressed in This Course:

Communication
Learning Skills
Critical Thinking
Interpersonal Skills and Human Relations
Understanding Science and Technology