COURSE PREFIX / NO:	**AUT 131**
COURSE TITLE:	**ELECTRICAL SYSTEMS**
LEC HRS/WEEK:	**2.0**
LAB HRS/WEEK:	**3.0**
CREDIT HRS/SEMESTER:	**3.0**

DL ATTENDANCE/VA STATEMENT
TEXTBOOK INFORMATION

COURSE DESCRIPTION

This course is a study of individual systems and components that when combine form the entire automobile electrical system. The course includes starting and charging systems, ignition, engine, chassis, and accessory systems as well as instruction in the proper use of electrical schematics.

COURSE COMPETENCIES

Upon successful completion of this course, the student should be competent to perform the following tasks:

Module 1. General Electrical System Diagnosis

1. Use wiring diagrams during diagnosis of electrical circuit problems.
2. Check voltage and voltage drop in electrical/electronic circuits using a digital multimeter; determine necessary action.
3. Locate shorts, grounds, opens, and resistance problems in electrical/electronic circuits; determine necessary action.
4. Measure and diagnose the cause of abnormal key off battery drain; determine necessary action.
5. Inspect and test switches, connectors, relays, and wires of electrical/electronic circuits; perform necessary action.
6. Perform solder repair of electrical wiring.
7. Review Ohm’s Law.
8. Review voltage, amperage, and resistance.

Module 2. Charging System Diagnosis and Repair

1. Diagnose charging system for the cause of undercharge, no-charge, and overcharge conditions.

2. Remove, inspect, and install alternator.

3. Disassemble alternator, clean, inspect, and test components; determine necessary action.

4. Perform charging system output test; determine necessary action.

5. Inspect, adjust, or replace generator (alternator) drive belts, pulleys and tensioners; check pulley and belt alignment.

6. Inspect and test voltage regulators/regulating circuit; perform necessary action.

7. Perform charging circuit voltage drop test; determine necessary action.

Module 3. Gauges, Warning Devices, and Driver Systems Diagnosis and Repair

1. Inspect and test gauges and gauge-sending units for cause of intermittent, high, low, or no gauge readings; determine necessary actions.

2. Inspect and test connectors, wires, and printed circuit boards of gauge circuits; determine necessary action.

3. Diagnose the cause of incorrect operation of warning devices and other driver information systems; determine necessary action.

4. Inspect and test sensors, connectors, and wires of electronic instrument circuits; determine necessary action.

Module 4. Accessories Diagnosis and Repair

1. Diagnose incorrect operation of motor driven accessory circuit; determine necessary action.

2. Diagnose incorrect heated glass operation; determine necessary action.

3. Diagnose incorrect electric lock operation; determine necessary action.

4. Diagnose incorrect operation of cruise control systems; repair as needed.

5. Diagnose supplemental restraint system concerns; determine necessary action. (Note: Follow manufacturer's safety procedure to prevent accidental deployment.)

6. Disarm and enable the airbag system for vehicle service.

7. Diagnose radio static and weak, intermittent, or no radio reception; determine necessary action.

8. Remove and install door panel.

9. Diagnosis body electronic system circuits using a scan tool; determine necessary action.

10. Check for module communication errors using a scan tool.

11. Diagnosis the cause of false, intermittent, or no operation of anti-theft system.

Module 5. Horn and Wiper/ Washer Diagnosis and Repair

1. Diagnosis incorrect horn operation; perform necessary action.

2. Diagnosis incorrect wiper operation; diagnosis wiper speed control and park problems; perform necessary actions.

3. Diagnosis incorrect windshield washer operation; perform necessary action.

Module 6. Ignition System Diagnosis and Repair

1. Diagnosis ignition system related problems such as no-starting, hard starting, engine misfire, poor driveability, spark knock, power loss, poor mileage, and emission concerns on vehicles with electronic ignition (distributorless) systems; determine necessary action.

2. Diagnosis ignition system related problems such as no-starting, hard starting, engine misfire, poor driveability, spark knock, power loss, poor mileage, and emission concerns on vehicles with distributor ignition (DI) systems; determine necessary action.

3. Inspect and test ignition primary circuit wiring and solid state components; perform necessary action.

4. Inspect, test and service distributor.

5. Inspect and test ignition system secondary circuit wiring and components; perform necessary action.

6. Inspect and test ignition coil(s); perform necessary action.

7. Check and adjust ignition system timing and timing advance/retard (where applicable).

8. Inspect and test ignition system pick-up sensors and triggering devices; perform necessary action.

COURSE REQUIREMENTS

Students are responsible for attaining competencies through completion of the following course requirements:

ATTENDANCE:

Students will be bound by the policies stated in the York Technical College Student Handbook. Students must attend 80% of the hours assigned the class for a semester to receive credit for the course. In case a student does miss a class, the student is responsible for obtaining the material that was covered during the absence. If a student is aware that a class will be missed, then the student should notify the instructor at the earliest possible date. Students with unexcused absences during tests will be allowed to make up tests at the discretion of the instructor. The student has the burden to be sure that some arrangement has been made with the instructor for taking a make-up test.

ACADEMIC HONESTY

York Technical College adheres to the South Carolina Tech Student code, approved by the State Board for Technical and Comprehensive Education on March 13, 1974(revised last April, 25 1984). Copies of this code are available in the Library and from Student Services. Any student involved in cheating or any other academic dishonesty will be given a grade of zero and will be subject to further disciplinary action. See the student handbook section “Student Life” subheading “Student Conduct” for further details.

PARTICIPATION IN CLASS

Students will be expected to participate in class discussions, to demonstrate problem solving techniques, to complete tests, homework, lab experiments, lab reports and other assigned work.

EVALUATION STRATEGIES / GRADING

The grading scale will be as follows:

Grade Points

A	90-100
B	80-89
C	70-79
D	60-69
F	00-59

Evaluation Method

Tests may be written or oral and may contain questions that are true or false, short answer, multiple choice, fill in the blank and/or problems. Students should refer to the instructor for the number of tests to be given and the material to be covered on each test. Each test will be of equal weight unless otherwise indicated by the instructor. Lab grades will be based on the completion of the Course Competencies, team work, safety, class participation, and housekeeping.

Final grades will be determined as follows:

Module 1.	Tests	6.67%
Module 1.	Lab	13.33%
Module 2.	Test	6.67%
Module 2.	Lab	13.33%
Module 3.	Test	6.67%
Module 3.	Lab	13.33%
Module 4.	Test	6.67%
Module 4.	Lab	13.33%
Module 5.	Test	6.67%
Module 5.	Lab	13.33%
Total Grade		100%

ENTRY-LEVEL SKILLS

Students should demonstrate hand eye coordination, manual dexterity, and be able to work in an industrial environment.

PREREQUISITES

AUT 133

CO-REQUISITES

None