

COURSE PREFIX/NO: **AUT 158**
COURSE TITLE: **AUTOMOTIVE DIAGNOSIS**
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 basic diagnosis procedures and the use of standard shop equipment.

COURSE COMPETENCIES:

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

Module 1. No-Start Condition

1. Diagnose a no-start condition and determine the system that is causing the problem.
2. Diagnose a no-start condition that is a result of an ignition system failure.
3. Diagnose a no-start condition that is a result of a fuel system failure.
4. Diagnose a no-start condition that is a result of a lack of compression.

Module 2. Electrical Diagnosis

1. Diagnose a no-crank condition and determine the cause.
2. Diagnose a slow cranking condition using a voltage drop test.
3. Diagnose low alternator output using a voltage drop test.
4. Diagnose a low battery charge condition resulting from an alternator failure.
5. Diagnose noises that result from a failing alternator.
6. Diagnose noises resulting from starter failure or poor starter installation.
7. Diagnose battery condition with a hydrometer and volt meter.
8. Diagnose key-off battery drain using a test light or multi-meter.

Module 3. Engine Diagnosis

1. Diagnose engine noises by the sound, frequency, and location of the noise.
2. Diagnose engine complaints by the smell of the engine and exhaust.
3. Diagnose engine complaints by the color of the exhaust smoke.
4. Diagnose engine complaints using a compression gauge.
5. Diagnose engine complaints using a cylinder leakage test.
6. Diagnose engine complaints using a cylinder balance test.
7. Diagnose engine complaints using an oscilloscope.
8. Perform engine tune-ups and service work.

PERFORMANCE OBJECTIVES

Module 1. No-Start Condition

1. Given a vehicle, the student will diagnose a no-start condition and determine the system that is causing the problem according to NATEF standards.
2. Given a vehicle, the student will diagnose a no-start condition that is a result of an ignition system failure according to NATEF standards.

3. Given a vehicle, the student will diagnose a no-start condition that is a result of a fuel system failure according to NATEF standards.
4. Given a vehicle, the student will diagnose a no-start condition that is a result of a lack of compression according to NATEF standards.

Module 2. Electrical Diagnosis

1. Given a vehicle, the student will diagnose a no-crank condition and determine the cause according to NATEF standards.
2. Given a vehicle, the student will diagnose a slow cranking condition using a voltage drop test according to NATEF standards.
3. Given a vehicle, the student will diagnose low alternator output using a voltage drop test according to NATEF standards.
4. Given a vehicle, the student will diagnose a low battery charge condition resulting from an alternator failure according to NATEF standards.
5. Given a vehicle, the student will diagnose noises that result from a failing alternator according to NATEF standards.
6. Given a vehicle, the student will diagnose noises resulting from starter failure or poor starter installation according to NATEF standards.
7. Given a vehicle, the student will diagnose battery condition with a hydrometer and volt meter according to NATEF standards.
8. Given a vehicle, the student will diagnose key-off battery drain using a test light or multi-meter according to NATEF standards.

Module 3. Engine Diagnosis

1. Given a vehicle, the student will diagnose engine noises by the sound, frequency, and location of the noise according to NATEF standards.
2. Given a vehicle, the student will diagnose engine complaints by the smell of the engine and exhaust according to NATEF standards.
3. Given a vehicle, the student will diagnose engine complaints by the color of the exhaust smoke according to NATEF standards.
4. Given a vehicle, the student will diagnose engine complaints using a compression gauge according to NATEF standards.
5. Given a vehicle, the student will diagnose engine complaints using a cylinder leakage test according to NATEF standards.
6. Given a vehicle, the student will diagnose engine complaints using a cylinder balance test according to NATEF standards.
7. Given a vehicle, the student will diagnose engine complaints using an oscilloscope according to NATEF standards.
8. Given a vehicle, the student will perform engine tune-ups and service work according to NATEF standards.

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	11%
Module 1.	Lab	22.33%
Module 2.	Test	11%
Module 2.	Lab	22.33%
Module 3.	Test	11%
Module 3.	Lab	<u>22.33%</u>
Total Grade		100%

ENTRY-LEVEL SKILLS

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

PREREQUISITES

None

CO-REQUISITES

None

TOPIC / CONTENT OUTLINE

Module 1. No-Start Condition

1. Fuel pressure tests
2. Ignition systems
3. Fuel systems
4. Fuel pressure tests
5. Basic engine operation
6. Noid-lites
7. Spark testers

Module 2. Electrical Diagnosis

1. Multi-meters
2. Starters
3. Alternators
4. Batteries
5. Test lights
6. Wiring diagrams
7. Ignition system

Module 3. Engine Diagnosis

1. Engine operation
2. Compression tests
3. Cylinder leakage tests
4. Cylinder balance tests
5. Oscilloscopes
6. Vehicle tune-ups

METHODS OF INSTRUCTION

This course consists of two hours of classroom instruction and three hours of lab instruction. The classroom instruction includes lectures, discussions, problem solving sessions, and tests. The lectures are given while drawing on the blackboard, using overhead projections, videotapes, demonstrations, and other multimedia methods. The laboratory instruction includes proper safety procedures, instructions on the proper use of lab equipment, proper diagnosis of mechanical and electrical related problems, and hands on experience with live repair projects.