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<b>COURSE PREFIX/NO:</b>	<b>AUT 247</b>
<b>COURSE TITLE:</b>	<b>ELECTRONIC FUEL SYSTEMS</b>
<b>LEC HRS/WEEK:</b>	<b>2.0</b>
<b>LAB HOURS/WEEK:</b>	<b>6.0</b>
<b>CREDIT HRS/SEMESTER:</b>	<b>4.0</b>

[Distance Learning Attendance/VA Statement](#)  
[Textbook Information](#)

## **COURSE DESCRIPTION**

This course includes the study of fuel injection systems, other fuel system components, and how computers control fuel delivery

## **COURSE COMPETENCIES**

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

### **Module 1 Computerized Engine Controls Diagnosis and Repair**

1. Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction. (P-1)
2. Retrieve and record stored OBD II DTC, clear codes when applicable. (P-1)
3. Diagnose the causes of emissions and drivability concerns resulting from failure of computerized engine controls with stored diagnostic trouble codes. (P-1)
4. Diagnose emissions or drivability concerns resulting from failure of computerized engine controls with no stored DTCs; determine necessary action. (P-1)
5. Check for module communication (including CAN/BUS systems) errors using a scan tool. (P-2)
6. Inspect and test computerized engine control system sensors, power train control module (PCM), actuators, and circuits using a graphing multimeter (GMM)/digital storage oscilloscope (DSO), perform necessary action. (P-1)
7. Obtain and interpret scan tool data. (P-1)
8. Access and use service information to perform a step-by-step diagnosis. (P-1)
9. Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, and calibration decals). (P-1)
10. Diagnose drivability and emission problems resulting from failures of interrelated systems (cruise control, security systems, suspension controls, traction controls, AC, automatic transmissions, non-OEM-installed accessories, and similar systems) determine necessary action. (P-3)
11. Perform active tests of actuators using scan tool; determine necessary action. (P-1)

## **Module 2 Fuel Delivery Systems**

1. Check fuel system pressure, compare to vehicle specifications.
2. Inspect fuel pressure regulator, perform necessary action.
3. Inspect lines, hoses, and fittings, perform necessary action.
4. Inspect/change fuel filter as needed.
5. Inspect/change in tank fuel pump.

## **Module 3 Sensor Network**

1. Check operation of oxygen sensor (O<sub>2</sub>).
2. Check operation of Manifold Absolute Pressure sensor (MAP).
3. Check operation of Throttle Position sensor (TPS).
4. Check operation of Vehicle Speed sensor (VSS).
5. Check operation of Coolant Temperature sensor (CTS).
6. Check operation of Manifold Air Temperature sensor (MAT).
7. Check operation of Exhaust Gas Recirculation (EGR) position sensor.
8. Check operation of Mass Air Flow sensor (MAF).
9. Check operation of Manual Lever Position sensor (MLP).
10. Check operation of Transmission Fluid Temperature sensor (TOT).
11. Check operation of Brake Pedal Position sensor (BOO).

## **TOPIC /CONTENT OUTLINE**

### **Module 1 Computerized Engine Controls Diagnosis and Repair**

1. OBD I code
2. OBD II code
3. Drivability with codes
4. Drivability no codes
5. Sensors
6. Digital meters
7. Electronic service info
8. Vehicle identification
9. Power/ground
10. Static devices
11. Interrelated systems

### **Module 2 Fuel Delivery Systems**

1. Fuel pressure
2. Regulator
3. Lines, hoses, fittings
4. Fuel filter
5. Fuel pump

### **Module 3 Sensor Network**

1. O<sub>2</sub> sensor
2. MAP sensor
3. TPS
4. VSS
5. CTS
6. MAT sensor

7. EGR position
8. MAF sensor
9. MLP sensor
10. TOT sensor
11. Brake switch

## **METHODS OF INSTRUCTION**

This course consists of two hours of classroom instruction and six 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 computerized engine control systems and related problems, and hands-on experience with live repair projects relating to computerized vehicle controls and fuel injection systems.

## **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 90% 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 Technical College System Student code, approved by the State Board for Technical and Comprehensive Education on March 13, 1974 (revised 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 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, teamwork, safety, class participation, and housekeeping.

### Final Grade will be determined as follows:

Module 1	Tests	16.66%
Module 1	Lab	16.66%
Module 2	Tests	16.66%
Module 2	Lab	16.66%
Module 3	Tests	16.66%
Module 3	Lab	<u>16.66%</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:** AUT 147 or equivalent

**CO-REQUISITES:** RDG 100

**Disabilities Statement:** Any student who feels s/he may need an accommodation based on the impact of a disability should contact the Special Resources Offices (SR) at 803-327-8007 in the 300 area of Student Services. The SRO coordinates reasonable accommodations for students with documented disabilities.