

**Common Course Outline**  
**AUTO 161**  
**Repairing Automotive Electronics**  
**5 Credits**

**The Community College of Baltimore County**

**Description**

**AUTO 161 – 5 credits – Repairing Automotive Electronics** introduces diagnosis and repair of automotive electronic systems and components; includes diagnosis, inspection, disassembly, and repair of electronic components such as computerized engine control, electronic ignition and fuel injection, and other electronic accessories. This course is taught during an 8-week session.

**5 credits:** 4 lecture hours; 9 laboratory hours per week

**Prerequisite:** AUTO 131 and AUTO 141

**Overall Course Objectives**

Upon completion of this course students will be able to:

1. trace wiring diagrams during diagnosis of electrical circuit problems;
2. diagnose drivability and emissions problems resulting from failures of inter-related systems (cruise control, security alarms, torque controls, suspension controls, traction controls, torque management, A/C, automatic transmissions, and similar systems) and determine needed repairs;
3. diagnose engine mechanical, electrical, electronic, fuel, and ignition problems with an oscilloscope and engine diagnostic equipment and determine needed action;
4. retrieve and record stored diagnostic trouble codes;
5. inspect, test, adjust, and replace computerized engine control system sensors, powertrain control module (PCM), actuators, and circuits;
6. obtain and interpret digital multimeter (DMM) readings;
7. diagnose no start, drivability and emissions problems on vehicles with electronic ignition (distributor less) systems and determine needed repairs;
8. diagnose no start, drivability and emissions problems on vehicles with distributor ignition (DI) systems and determine needed repairs;
9. inspect and test ignition coil(s) and replace as needed;
10. inspect and test mechanical and electrical fuel pumps and pump control system and replace as needed;
11. inspect and test fuel pressure regulation system and components of injection-type fuel systems and adjust or replace as needed;
12. inspect and test fuel injectors and clean or replace;
13. diagnose emissions and drivability problems caused by failure of the exhaust gas recirculation (EGR) system; and

14. perform all other up-to-date National Automotive Technicians Education Foundation (NATEF) tasks from the master course list.

### **Major Topics**

- I. Theory and operation of the internal combustion engine
- II. Theory and operation of automotive computer systems
- III. Fuel systems controls and operation
- IV. Ignition systems controls and operation
- V. Exhaust systems controls and treatment

### **Course Requirements**

#### Grading/Exams:

Grading procedures will be determined by the individual faculty member and will be provided on the first day of class. A student can expect a minimum of eight grades from the following categories:

1. Quizzes
2. Lab projects
3. Written paper
4. Homework assignments
5. Midterm exam
6. Class participation
7. Comprehensive final skills assessment (required)

#### One Term Paper

1. Topic of the paper will be selected by the student and should relate to the subject material of the course.
2. The paper should be 6 to 8 pages in length, typewritten, and double-spaced. It should include in addition to the 6 to 8 pages of text, an author and title page and bibliography utilizing a minimum of three reference resources excluding classroom materials.
3. All papers are due when 80% of the class sessions are completed. Papers submitted late will be deducted one letter grade.

Written Assignments: Students are required to utilize appropriate academic resources.

### **Other Course Information**

AUTO 161 approaches repairing automotive electronics as a learning process that incorporates theory with laboratory experience. To complete the course successfully, practical ability as well as knowledge of theory must be demonstrated.

This course is an Automotive Technology core course.

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