

Common Course Outline
AUTO 101
Servicing Automotive Heating and Air-Conditioning Systems
4 Credits

The Community College of Baltimore County

Description

AUTO 101 – 4 Credits – Servicing Automotive Heating and Air-Conditioning Systems introduces students to automotive heating and air-conditioning systems, components, operations, and service procedures; it includes component replacement and system purging, evacuating, charging, and testing. This course is taught during an 8-week session.

4 credits: 3 lecture hours; 9 laboratory hours per week.

Prerequisite: AUTO 131

Overall Course Objectives

Upon completion of this course students will be able to:

1. diagnose unusual operating noises in the A/C system and determine needed repairs;
2. conduct performances test of the A/C system and determine needed repairs;
3. conduct leak test of A/C system and determine needed repairs;
4. inspect A/C compressors drive belts, replace, and adjust as needed;
5. inspect, test, and replace A/C compressor clutch components or assembly;
6. remove and replace the A/C compressor and mountings;
7. diagnose temperature control problems in the heater/ventilation system and determine needed repairs;
8. perform cooling system, cap, and recovery system tests (pressure, combustion leakage, and temperature) and determine needed repairs;
9. inspect engine cooling and heater system hoses and belts and replace as needed;
10. inspect, test, and replace thermostat and housing;
11. determine coolant condition, drain; and recover coolant;
12. diagnose failures in the electrical controls of the heating and A/C systems and determine needed repairs;
13. inspect and test A/C-heater blower, motors, resistors, switches, relays, wiring, and protection devices and repair or replace as needed;
14. verify correct operation and maintenance of refrigerant handling equipment;
15. identify and recover A/C system refrigerant;
16. recycle refrigerant;
17. label and store refrigerant;
18. test recycled refrigerant for non-condensable gases;
19. evacuate and charge A/C system; and

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

Major Topics

- I. Theory of heat transfer
- II. Theory of AC operation
- III. AC components and operation
- IV. AC controls
- V. AC diagnosis

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 (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 101 approaches automotive air-conditioning 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.