AUTO 101
Automotive Climate Control
4 Credits: 2 Lecture, 6 Lab hours

Community College of Baltimore County
Common Course Outline

Description

AUTO 101 – Automotive Climate Control is a course in which students are introduced to automotive heating and air-conditioning (A/C) systems, components, operations, and service procedures. Students learn component replacement and system purging, evacuating, charging, and testing. Individual Major Topics are covered in more detail based on manufacturer specific curriculum.

Pre-requisites: AUTO 100, AUTO 136

Overall Course Objectives

Upon completion of this course, students will be able to:

1. diagnose unusual operating noises in the A/C system to determine needed repairs;
2. test the condition and performance of the A/C system to determine needed repairs;
3. conduct leak test of A/C system to determine needed repairs;
4. inspect A/C compressor drive belts to determine if replacement or adjustment is 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 to determine needed repairs;
8. perform cooling system, cap, and refrigerant system tests such as system and cap pressure tests, combustion leakage into the cooling system, and proper operating temperature to 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. test vehicle coolant condition to assess if recovery and replacement is needed;
12. diagnose failures in the electrical controls of the heating and A/C systems to determine needed repairs;
13. inspect and test A/C systems: 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 systems; and
20. perform all required Automotive Service Excellence (ASE) Education Foundation tasks from the ASE master course list.

Major Topics

I. Theory of heat transfer
II. Theory of A/C operations
III. A/C components and operations
IV. A/C controls
V. A/C diagnosis

Course Requirements

Grading will be determined by the individual faculty member, but shall include the following, at minimum:

- three quizzes
- weekly lab projects
- research paper (6-8 pages typed) or obtain the ASE Professional Certification
- three homework assignments
- active engagement in class activities
- one midterm exam
- one comprehensive final exam with a written component and a hands-on individual assessment

Written assignments and research projects: Students are required to use appropriate academic resources in their research and cite sources according to the style selected by their professor.

Other Course Information

This class combines lab with lecture and students apply knowledge learned in a hands-on environment.

Date Revised: 12/5/2023