



CENTRAL PIEDMONT COMMUNITY COLLEGE

AUB 141 Mechanical and Electrical Components

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Time Requirements:
16 Week Session
2 Class Hours/Week
2 Lab Hours/Week

3 Semester Hours Credit

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TEXT: *MOTOR AUTO BODY REPAIR*; Fifth Edition Robert Scharff,
James E. Duffy

AUB 141

Mechanical and Electrical Components

Prerequisites: None

Course Description

This course covers the basic principles of automotive mechanical and electrical components. Topics include personal and environmental safety and suspension and steering, electrical, brakes, heating and air-conditioning, cooling drive train, and restraint systems. Upon completion, students should be able to identify systems components and perform basic system diagnostic checks and/or repairs according to industry standards.

AUB 141 Course Objectives

1. Perform electrical repairs and solder splices in automotive wiring.
2. Learn about different electrical repair procedures.
3. Use the appropriate equipment to perform electrical repairs.
4. Find shorts in wiring.
5. Learn the different parts of suspension components and their purpose.
6. Remove and replace worn components.
7. Diagnose suspension alignment problems.
8. Diagnose and inspect automotive seat problems.
9. Remove and Replace seat covers in order to diagnose needed repair to seats.
10. Discuss liability issues involved with the use of used parts.
11. Remove and replace components of a Supplemental Restraint System.
12. Remove and Replace necessary components to perform needed repairs.
13. Remove engine assembly as a unit to perform needed repairs.
14. Discussion of different Freon's.
15. Diagnosis of air-conditioning problems.
16. Discussion of operation of electric fan assemblies.
17. Diagnose cooling system problems.
18. Mount and balance tires.
19. Diagnose bearing failure.
20. Replace headliner materials.
21. Replace engine mounts.
22. Replace cooling system hoses.
23. Perform headlamp aiming procedures.
24. Retrofit air-conditioning system from refrigerant R-12 to refrigerant R-13a.
25. Discussion on brake problems.
26. Perform repairs on stationary and movable glass in vehicles.
27. Diagnose problems associated with window regulators and power window motors.
28. Remove and replace axles on front wheel drive vehicles.
29. Perform cut-out procedures on front and rear stationary glass.
30. Overhaul procedures on a McPherson strut suspension.
31. Identify safety measures associated with automotive repair.

Weekly Outline*

AUB 141

Mechanical and Electrical Components

Curriculum Program

| | | |
|---------|--|--------------|
| Week 1 | Orientation | Delmar Video |
| Week 2 | Electrical Repairs | Chapter 22 |
| Week 3 | Automotive Upholstery | Chapter 16 |
| Week 4 | Chassis Service and Wheel Alignment | Chapter 21 |
| Week 5 | Chassis Service and Wheel Alignment | Chapter 21 |
| Week 6 | Wheel Alignment | Chapter 21 |
| Week 7 | Air Conditioning Service and Retrofit | Chapter 21 |
| Week 8 | Midterm Review and Exam | |
| Week 9 | Glass Removal and Replacement | Chapter 15 |
| Week 10 | Restraint System Operation and Service | Chapter 23 |
| Week 11 | Removal and Replacement of Major Units | Chapter 21 |
| Week 12 | Removal and Replacement of Major Units | Chapter 21 |
| Week 13 | Lab Operations | |
| Week 14 | Lab Operations | |
| Week 15 | Lab Operations | |
| Week 16 | Clean Shop and Final Exam | |

❖ It may be necessary to switch these modules around to meet shop requirements.

Student Evaluation

Student Grade Point Average

Students are graded according to the following grade point system.

The following grades will not be used to compute the grade point average.

| | | | | |
|-------|-------------|--------------|-----|-----------------------|
| Grade | Point Value | Description | I | Incomplete |
| A | 4 | Excellent | W | Withdrawal |
| B | 3 | Very Good | U | Unsatisfactory |
| C | 2 | Satisfactory | AUD | Audit |
| D | 1 | Poor | N | Never Attended |
| F | 0 | Failing | X | Credit by examination |

Since this course is preparatory to entering the automotive service industry, job attitude, neatness, promptness and care of equipment will be considered part of the final grade. The final grade on these items will be determined by the instructor and based upon accepted industry standards.

For a grade "A"

Complete all written tests with an average of 93% to 100 %. Attend 90% of all scheduled class/lab hours. Complete all lab/shop work in a manner that would be determined EXCELLENT in an actual shop.

For a grade "B"

Complete all written tests with an average of 85% to 92%. Attend 85% of all scheduled class/lab hours. Complete all lab/shop work in a manner that would be determined VERY GOOD in an actual shop.

For a grade "C"

Complete all written tests with an average of 77% to 84%. Attend 80% of all scheduled class/lab hours. Complete all lab/shop work in a manner that would be determined SATISFACTORY in an actual repair shop.

For a grade "D"

Complete all written tests with an average of 70% to 76%. Attend 80% of all scheduled class/lab hours. Complete all lab/shop work in a manner that would be determined POOR in an actual repair shop.

Students will be required to successfully complete the ASE Recovery and Recycling Certification as part of their grade. This will count as 10% of the final end of semester grade. This test is done online at www.asecert.org.

Go to ASE campus and click on the create a profile link located in the refrigerant and recovery section. The current cost of this test is \$15.00.

Auto-Body Repair Program Safety Regulations

1. Instructor must be present any time a class or lab is in session
2. Use of safety glasses is required in all labs.
3. Any safety hazard should be reported to the instructor immediately.
4. Floor must be kept clear of any liquid spills or tripping hazards.
5. No equipment may be operated by students until they receive instruction on proper, safe operation of that equipment.
6. Vehicle lifts must be mechanically secure before under vehicle work is performed.
7. Uses of jack stands are required when using a floor jack to raise vehicle.
8. Open-type shoes (sandals) are not permitted in any lab.
9. Any loose-fitting clothing or jewelry must be secured so that is it not a hazard or inconvenience.
10. Shorts or sleeveless shirts are not permitted.
11. Smoking is permitted in designated areas only.
12. Students and faculty must follow OSHA rules concerning exposure to blood borne diseases.
13. Students are required to leave the lab areas clean and in order before being dismissed from class.
14. Cell phones and pagers must be put on silent or vibrate during all class and lab meetings so that their operation does not interfere with class activities.
15. Students are expected to meet for the entire class period in order to receive credit for that day.
16. Visitors are not permitted inside of the lab areas.
17. Students are not permitted to wash their vehicle unless it meets class objectives.
18. Items that are specified by your instructor must be brought to every class meeting.
19. Students are required to furnish all of his or her materials when working on their vehicle. The school furnishes masking paper, spray guns, and a place to work.
20. Students are not to assemble in the office unless they have business with an instructor.
21. No music is to be played around the CAT Building.
22. Students that miss over 20% of the class will not pass the class.

23. Students should no ask other instructors for tools or supplies.

Tool List

1. Safety Glasses
2. Mechanics Gloves or Latex Gloves

When the lab is open for students to work on their own projects at the end of the semester, each student is expected to furnish his/her own hand tools for their project. There are not enough tools to furnish every student with the needed supplies.