

Automotive Air Conditioning Systems

Automotive Technology Department
College of Applied Sciences and Arts
Southern Illinois University Carbondale

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Class Calendar

Meeting Time: 1-4:50 PM
August 19-September 20
Mon, Tues, Thurs, Fri.
(Wed. by arrangement)

Class Location

Laboratory: Lab-1
Classroom: TEC 0134

Prerequisite
AUT170

Final Exam

September 20, 2013

Office Hours

MTThF 10:00 AM-12:00PM
or by appointment

Course Description:

A study of refrigeration systems, temperature controls, and automotive HVAC vacuum/electrical circuits. Emphasis placed on environmental impact of refrigerants, environmentally safe refrigerant technology and applicable legislation. Laboratory experiences provide the opportunity to study the use of air conditioning system diagnostic tools, refrigerant recovery/recycling equipment, and diagnostic and repair services.

Course Objectives:

This course will provide the student with the opportunity to:

1. identify the major components of the refrigeration system.
2. understand the refrigerant cycle.
3. perform refrigerant recovery, recycling, and recharging.
4. diagnose refrigeration and HVAC system problems
5. perform HVAC service procedures.

Course Topics/Units of Study

- Principles of Refrigeration and Effects on the Environment
- Operation and Diagnosis of Refrigeration Components
- Operation of Refrigerant Service and Testing Equipment
- Air Conditioning System Maintenance/Service
- Operation and Diagnosis of HVAC Controls
- Approved Retrofitting Procedure

Grading and Testing

- Grading:** The student's grade is determined from lab activities, written tests, performance tests, assignments, participation, and attendance. The overall grade can be influenced positively and negatively by their lab activities, attendance, participation, and enthusiasm. The percentage breakdown is as follows:
- A = 93% to 100%
 - B = 85% to 92.9%
 - C = 76% to 84.9%
 - D = 70% to 75.9%
 - F = 69.9% and Lower
- Lab:** The laboratory component of this class is significant and all students are expected to participate fully during these times. Laboratory work will consist of specific assignments, instructor assigned work, which may include vehicles from the general public. Students will gain useful experience reinforcing the theory taught in the classroom. Lab work must be performed in a timely manor to maximize the benefit to the student. Laboratory work should include; refrigerant services, leak repairs, component services and air-management system repair. Students will be expected to observe all program and shop regulations and participate in maintaining a clean and safe work environment. The Lab Activities, which involve completing worksheets while performing various assembly, disassembly and performance of activities will be graded for thoroughness. 30 lab sheets are expected to be completed during the available lab time in class. 10 points will be deducted from the total lab book points earned for every lab sheet less than 30. For example: 25 lab sheets completed = 175 points – 50 points (5 labs short)= 125 out of 210 possible
- Homework:** Homework includes assignments from the textbook and the lab worksheets. Any homework turned in 1 days late will result in a 50% loss of points. No credit will be given for assignments not turned in after 2 days.
- Written Tests:** The written tests and quizzes will be ASE style questions over topics covered in lecture, lab demonstrations, handouts, and the book. Expect a quiz/test approximately every 5 class days. Quizzes will be at the instructor's discretion. Make up tests and quizzes will only be allowed with a doctor's note, or an agreement with the instructor in advance of an absence. The test or quiz must be made up within 2 days of the absence.
- Refrigerant Licensure:** Federal law requires professional technicians to be certified in the handling of refrigerants. You will be provided a booklet containing the refrigerant information and quiz. The quiz will be given in class and you **MUST** pass this quiz in order to complete this course. If you would like to obtain your license it is your responsibility to mail in the nominal fee (\$15) to obtain your license. The quizzes are also available online at www.ase.com or www.macsw.org
- Lab Participation:** Each student will be evaluated for lab participation during the course. This evaluation is based on the instructor's evaluation and observation of a student's performance in 5 areas. Some examples are listed, but not limited to what is listed.
1. Equipped for class: this includes **WEARING** safety glasses in the labs
 2. On-time and on-task: does not abuse break times or cell phone use (as examples)
 3. Professionalism: this can include working and interacting with others
 4. Work Quality: follows procedures, treatment of vehicles, working on your own
 5. Clean up: Keeping your work area clean and returns borrowed tools to proper location
- Attendance:** Attendance is mandatory. 2.5% of your grade will be dropped for every absence. Every three tardies will equal one absence. It is important that you show up to class **on time**.
- Required Tools:** This course requires a complete tool set including all of the tools identified on the required tool list provided.

Required Student Materials

1. Textbook: *Auto Heating and Air Conditioning*, Third Edition, Chris Johnson, G-W Publishing
2. Multimedia CD for above Textbook
3. A three (3) ring binder. 2.0 inch.
4. Toolbox with tools as per listed for enrollment into the automotive program. (A list may be obtained at the administration office.)
5. Safety glasses.
6. Recommended: pocket calculator, jump drive, jumper lead set, and inspection light.

SAFETY GLASSES ARE MANDATORY. IF FOUND WITHOUT YOUR SAFETY GLASSES YOU WILL RECEIVE ONE WARNING BEFORE BEING ASKED TO LEAVE!

IN CASE OF AN EMERGENCY IN THE LAB:

Dial 88-911 and provide:

- Nature of emergency
- Victim's condition
- Location of emergency
- Building #2828, Administration Drive, College of Applied Sciences and Arts, Carterville Campus

Emergency Procedures:

Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the SIUC Emergency Response Plan and Building Emergency Response Team (BERT) program. Emergency response information is available on posters in buildings on campus, available on the BERT's website at www.bert.siu.edu, Department of Public Safety's website www.dps.siu.edu (disaster drop down) and in the Emergency Response Guidelines pamphlet. Know how to respond to each type of emergency.

Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. **It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency.** The Building Emergency Response Team will provide assistance to your instructor in evacuating the building or sheltering within the facility.