

**AUTO 125 Course Outline as of Spring 2011****CATALOG INFORMATION**

Dept and Nbr: AUTO 125 Title: AUTO HEAT AIR COND SYST

Full Title: Automotive Heating and Air Conditioning Systems

Last Reviewed: 9/20/2010

| Units   |      | Course Hours per Week |      | Nbr of Weeks | Course Hours Total |       |
|---------|------|-----------------------|------|--------------|--------------------|-------|
| Maximum | 1.50 | Lecture Scheduled     | 1.00 | 17.5         | Lecture Scheduled  | 17.50 |
| Minimum | 1.50 | Lab Scheduled         | 1.50 | 8            | Lab Scheduled      | 26.25 |
|         |      | Contact DHR           | 0    |              | Contact DHR        | 0     |
|         |      | Contact Total         | 2.50 |              | Contact Total      | 43.75 |
|         |      | Non-contact DHR       | 0    |              | Non-contact DHR    | 0     |

Total Out of Class Hours: 35.00

Total Student Learning Hours: 78.75

Title 5 Category: AA Degree Applicable

Grading: Grade Only

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

**Catalog Description:**

Theory, service and repair of many types of automotive heating and air conditioning systems. Includes environmental and safety concerns using R-12 and R-134a refrigerants. Engine heating and cooling, manual and automatic system controls will also be introduced. Prepares the student to take the A7 ASE (Automotive Service Excellence) certification exam.

**Prerequisites/Corequisites:****Recommended Preparation:**

Eligibility for ENGL 100 or ESL 100

**Limits on Enrollment:****Schedule of Classes Information:**

Description: Theory, service and repair of many types of automotive heating and air conditioning systems. Includes environmental and safety concerns using R-12 and R-134a refrigerants. Engine heating and cooling, manual and automatic system controls will also be introduced. Prepares the student to take the A7 ASE (Automotive Service Excellence) certification exam. (Grade Only)

Prerequisites/Corequisites:

Recommended: Eligibility for ENGL 100 or ESL 100

Limits on Enrollment:

Transfer Credit:

Repeatability: Two Repeats if Grade was D, F, NC, or NP

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

**AS Degree:**      **Area**      Effective:      Inactive:

**CSU GE:**      **Transfer Area**      Effective:      Inactive:

**IGETC:**      **Transfer Area**      Effective:      Inactive:

**CSU Transfer:**      Effective:      Inactive:

**UC Transfer:**      Effective:      Inactive:

**CID:**

**Certificate/Major Applicable:**

Both Certificate and Major Applicable

## **COURSE CONTENT**

**Outcomes and Objectives:**

Upon completion of this course, the student will be able to:

1. Use related tools and equipment safely.
2. Recognize environmental issues and apply standards involved in maintenance and repair of automotive refrigeration systems.
3. Describe the operation of basic automotive heating and refrigeration systems.
4. Identify and describe the components used in automotive heating and refrigeration systems.
5. Inspect and validate individual system components.
6. Diagnose and repair electrical control systems.
7. Correctly use diagnostic tools.
8. Analyze and write the complaint -- cause -- correction of a system failure.
9. Demonstrate the skills necessary to complete the A7 portion of the ASE test series.

**Topics and Scope:**

1. Principles of the basic refrigeration system and how they apply to any system
2. Temperature and pressure fundamentals
3. Engine cooling systems
4. Manual and automatic comfort systems
5. Systems components
6. Case and duct systems
7. Air conditioning tools used in diagnosing and repairing
8. AC system testing and diagnoses
9. Electrical control systems
10. System service
11. Safety and hazards concerning use of refrigerants
12. Retrofitting R-2 systems to R-134a refrigerants

**Assignment:**

1. Reading 10 - 25 pages per week
2. Answer the questions at the end of each chapter
3. Participate in classroom discussion
4. List the environmental hazards of using various refrigerants
5. Complete the demonstration worksheet for each classroom discussion
6. Skill demonstrations:
  - a. Employ rules about shop safety
  - b. Locate components used in automobile refrigeration systems
  - c. Identify, by touch, the areas of a refrigeration system which should be hot and cold and compare findings with the textbook and class discussions
  - d. Make use of a manifold gauge set
  - e. Set up a system performance test
  - f. Show skill in using diagnostic tools
7. Complete homework problems in handouts
8. Quizzes (2-5) and final exam

**Methods of Evaluation/Basis of Grade:**

**Writing:** Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments and skill demonstrations are more appropriate for this course.

Writing  
0 - 0%

**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problems

Problem solving  
5 - 10%

**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Demo worksheets; skill demonstrations

Skill Demonstrations  
10 - 20%

**Exams:** All forms of formal testing, other than skill performance exams.

Exams: multiple choice, true/false, matching items, completion, short answer

Exams  
60 - 80%

**Other:** Includes any assessment tools that do not logically fit into the above categories.

Attendance and participation

Other Category  
5 - 15%

**Representative Textbooks and Materials:**

Today's Technician Automotive Heating and Air Conditioning, by Schnubel, Mark, Thomson  
Delmar Learning, 2005.

Instructor prepared materials.