COURSE INFORMATION FORM

DISCIPLINE  
Automotive Technology

COURSE TITLE  
Automotive Air Conditioning

CR.HR  4  
LECT HR.  2  
LAB HR.  4  
CLIN/INTERN HR.  
CLOCK HR.  

CATALOG DESCRIPTION

This course incorporates history, theories of operation, diagnosis, and repair of various types of automotive air conditioners, and cabin heating systems. Practice using refrigerant identification and reclaiming equipment. Students will have the opportunity to become certified to purchase and handle refrigerants.

PREREQUISITES

AUTO 100, and AUTO 166.

EXPECTED STUDENT OUTCOMES IN THE COURSE (ESO)

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

1. Demonstrate the cognitive and manipulative skills necessary to complete assigned tasks.
2. Describe and employ safe work habits, observing both personal safety and a concern for the safety of others.
3. Analyze, diagnose and determine necessary actions to solve heating, ventilation, and air conditioning concerns.
4. Apply procedures needed to successfully perform service operations.
5. Employ effective behaviors necessary to successfully work with others.

GENERAL EDUCATION OUTCOMES (ESO)

Specify which general education outcomes, if any, are substantially addressed by the course. Numbers in parentheses identify the Expected Student Outcomes linked to the specific General Education Outcome.

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>ESO</th>
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Revised 5/9/13
PROGRAM-LEVEL OUTCOMES

CAREER AND TECHNICAL EDUCATION PROGRAM OUTCOMES
Specify which Career and Technical program outcomes, if any, are substantially addressed by the course by completing the “Career and Technical Education template” to show the relationship between course and program outcomes to assessment measures.

1. Students will demonstrate the knowledge necessary to obtain recognized certifications.
2. Students will demonstrate or apply knowledge of basic sciences to the practices of automotive technology.
3. Students will demonstrate the knowledge and application of safety rules and regulations.
4. Students will exhibit professional behavior.
5. Students will be able to use mathematics as it pertains to the automotive technicians.

CLASS-LEVEL ASSESSMENT MEASURES
Student accomplishment of expected student outcomes may be assessed using the following measures. (Identify which measures are used to assess which outcomes.)

One of more of the following will be used:

1. Written evaluation (1-4)
2. Oral evaluation (1-5)
3. Performance exams (1-4)
4. Written Laboratory assignments (1-5)

Revised 5/9/13
Individual instructors may order this outline as fits the needs of their individual courses. In addition, they may place more emphasis on some areas than on others. What is assured is that this particular list is covered in the course. Other topics may be added to a course as the instructor sees fit, and as time and interest allow. An *asterisk can be used to mark an item as optional.

I. Introduction
   A. Health and safety
   B. Environment harm and effects
   C. Technician certification
   D. Ozone protection regulations

II. Fundamentals & Principles of refrigeration.
   A. Definition of refrigeration
   B. Principles of heat and cold
   C. ASE and EPA certification

III. Refrigeration system operation
   A. Refrigerants
   B. Temperature and pressure relationships of refrigerants

IV. Components of the refrigeration system
   A. Refrigeration cycle
   B. Compressor
   C. Condenser
   D. Receiver-drier
   E. Evaporator
   F. Metering devices
   G. Accumulator

V. System performance testing
   A. Gauge readings
   B. Temperature differences and dealing with humidity
   C. Refrigeration recovery – EPA regulations
   D. Evacuation and charging

VI. Leak testing
   A. Halide leak detector
   B. Leak detection using a soap solution
   C. Leak detection using dye
   D. Electronic leak detector

VII. Compressors and clutches
   A. Types of compressors
B. Rotary vane compressors
C. Reciprocation compressors
D. Variable displacement compressors

VIII. Automatic temperature systems
A. Service and repair
B. Calibration and system component replacement

IX. Retrofit of refrigerant systems
A. Recovery and disposal of contaminated refrigerants
B. Retrofit components
C. System flushing
D. System performance and diagnosis of problems

IX. Engine cooling systems
A. Cooling system operation
B. Cooling system testing
C. Cooling system repair
D. Cooling system diagnosis

X. Cabin heating systems
A. Cabin heating system operation
B. Cabin heating system testing
C. Cabin heating system repair
D. Cabin heating system diagnosis