AUTO 126 Course Outline as of Fall 2019

CATALOG INFORMATION

Dept and Nbr: AUTO 126 Title: MOBILE HVAC
Full Title: Mobile Heating and Air Conditioning Systems
Last Reviewed: 8/27/2018

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	2.50	Lecture Scheduled	2.00	17.5	Lecture Scheduled	35.00
Minimum	2.50	Lab Scheduled	1.50	8	Lab Scheduled	26.25
		Contact DHR	0		Contact DHR	0
		Contact Total	3.50		Contact Total	61.25
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 70.00 Total Student Learning Hours: 131.25

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 mobile heating and air conditioning systems. Includes environmental and safety concerns using R-12, R-134a, and R-1234yf refrigerants. Engine heating and cooling, manual and automatic system controls will also be introduced. Prepares the student to take the A7 & T7 ASE (Automotive Service Excellence) certification exams.

Prerequisites/Corequisites:
Course Completion of AUTO 80 OR Course Completion of DET 179 (or DET 80 or DET 60)

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 mobile heating and air conditioning systems. Includes environmental and safety concerns using R-12, R-134a, and R-1234yf 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: Course Completion of AUTO 80 OR Course Completion of DET 179 (or DET 80 or DET 60)
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

Student Learning Outcomes:
At the conclusion of this course, the student should be able to:
1. Identify and describe the theory, service and repair of common types of automotive heating and air conditioning systems.
2. Use industry standard recovery, recycling and recharging equipment to diagnose and service automotive air conditioning systems.
3. Demonstrate the skills necessary to pass the ASE (Automotive Service Excellence) A7 Heating and Air Conditioning Examination.

Objectives:
At the conclusion of this course, the student should 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:

I. Principles of the basic refrigeration system and how they apply to any system
   A. Automotive equipment

B. Transportation equipment
C. Hybrid and electric equipment
D. Agricultural and construction equipment

II. Temperature and pressure fundamentals
III. Engine cooling systems
IV. Manual and automatic comfort systems
V. Systems components
VI. Case and duct systems
VII. Air conditioning tools used in diagnosing and repairing
VIII. AC system testing and diagnoses
IX. Electrical control systems
X. System service
XI. Safety and hazards concerning use of refrigerants
XII. Retrofitting R-12 systems to R-134a refrigerants

All topics are covered in the lecture and lab portions of the course.

Assignment:

Lecture-related Assignments:
1. Reading 25-50 pages per week
2. Answer the questions at the end of each chapter
3. Quizzes (2-5) and final exam

Lab-related Assignments:
1. Participate in classroom discussion
2. Complete the demonstration worksheet for each classroom discussion
3. 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 recovery, recycling, and recharging equipment
   e. Set up a system performance test
   f. Show skill in using diagnostic tools

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 20 - 30%

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

Quizzes and Exams: multiple choice, true/false, matching items, completion, short answer	Exams 50 - 70%

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. 6th ed. Schnubel, Mark. Cengage Learning. 2017