

ATL 170 Course Outline as of Fall 2024**CATALOG INFORMATION**

Dept and Nbr: ATL 170 Title: MOBILE HVAC
 Full Title: Mobile Heating and Air Conditioning Systems
 Last Reviewed: 1/22/2024

Units	Course Hours per Week		Nbr of Weeks	Course Hours Total		
Maximum	3.00	Lecture Scheduled	2.00	17.5	Lecture Scheduled	35.00
Minimum	3.00	Lab Scheduled	3.00	6	Lab Scheduled	52.50
		Contact DHR	0		Contact DHR	0
		Contact Total	5.00		Contact Total	87.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 70.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable

Grading: Grade or P/NP

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

Also Listed As:

Formerly:

Catalog Description:

Students will study the theory, service, and repair of many types of mobile heating and air conditioning systems. This course 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 Automotive Service Excellence (ASE) A7 Heating and Air Conditioning or T7 Heating, Ventilation and Air Conditioning (HVAC) certification tests.

Prerequisites/Corequisites:

Course Completion of ATL 101 and ATL 161

Recommended Preparation:

Eligibility for ENGL 1A or equivalent and MATH 25 or equivalent

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

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Prerequisites/Corequisites: Course Completion of ATL 101 and ATL 161

Recommended: Eligibility for ENGL 1A or equivalent and MATH 25 or equivalent

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:
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CSU Transfer:	Effective:	Inactive:
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UC Transfer:	Effective:	Inactive:
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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 A7 or T7 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, and correction of a system failure.
9. Demonstrate the skills necessary to complete the A7 or T7 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
 - A. R-12
 - B. R-134a
 - C. R-1234yf
- 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. Chapter review questions
3. Quizzes (2-5) and final exam

Lab-Related Assignments:

1. Participate in classroom discussion
2. Demonstration worksheet for each classroom discussion
3. Skill demonstrations, such as:
 - 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.

Chapter review questions

Problem solving
5 - 10%

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

Demonstration worksheet; skill demonstrations

Skill Demonstrations
20 - 30%

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

Quizzes and final exams

Exams
50 - 70%

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

Participate in classroom discussion

Other Category
5 - 15%

Representative Textbooks and Materials:

Today's Technician Automotive Heating and Air Conditioning. 6th ed. Schnubel, Mark. Cengage Learning. 2017 (classic)

Automotive Heating, Ventilation, and Air Conditioning. Wagner, Joseph and VanGelder, Kirk. CDX Automotive. 2019 (classic)

Instructor prepared materials