

**University of Arkansas - Fort Smith**  
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## **General Syllabus**

### **ASTE 15804 Heating & Air Conditioning Systems**

Credit Hours: 4

Lecture Hours: 2

Laboratory Hours: 4

Prerequisite: ASTE 14304 Electrical Systems I

Effective: 2018-2019

#### **I. Course Information**

##### **A. Catalog Description**

A study of automotive and diesel air-conditioning systems, including valves in receiver systems. Venturi systems and a broad look at automotive and diesel air-conditioning compressors are included in this course.

##### **B. Additional Information**

Basic principles of air conditioning and service of these units are the primary materials covered in this class. Cycling systems of the expansion valve type and the orifice tube systems are covered. All popular compressors are serviced in the common ways in which they are usually dealt with in the field. All systems that affect the air conditioning will also be dealt with in principles of operation and troubleshooting.

#### **II. Student Learning Outcomes**

##### **A. Subject Matter**

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

1. Perform air conditioning system diagnosis and repair.
2. Perform refrigeration system problems that cause the pressure protection devices to interrupt system operation.
3. Perform heating and engine cooling systems diagnosis and repair.
4. Perform electrical tests on heater and air conditioning controls.
5. Perform vacuum/mechanical tests on heater and air conditioner controls.
6. Take a customer's complaints.

##### **B. University Learning Outcomes**

This course enhances student abilities in the following areas:

**Communication Skills (written and oral)**

Students must deal effectively with customers' complaints and ask effective questions to elicit more information.

**Analytical Skills**

**Critical Thinking Skills:** Students must analyze data gathered from customer complaints, inspections, tests, etc. in order to diagnose automotive and diesel air-conditioning system problems.

**III. Major Course Topics**

## Cooling Systems

- A. Nomenclature and purpose of engine cooling
- B. Air cooling versus liquid cooling
- C. Construction and operation of cooling system
- D. Purpose and use of rust inhibitors and causes of cooling system failure
- E. Specific gravity, types of anti-freeze and safety precautions
- F. Construction of water pump seals and operation of fans

## Air Conditioning Systems

- A. Nomenclature and precautions
- B. Operation and principles of air conditioning
- C. Use of testing gauges and function of the air conditioning component parts
- D. Visual checking, use of Freon gas as a coolant and use of vacuum pumps.
- E. Recharging systems, leak detectors, troubleshooting the air conditioning system.