COURSE OUTLINE
AUTO 103 AUTOMOTIVE AIR CONDITIONING

Prepared By: BRANDON BALDWIN
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A. **TITLE:** AUTOMOTIVE AIR CONDITIONING

B. **COURSE NUMBER:** AUTO 103

C. **CREDIT HOURS:** 2

D. **WRITING INTENSIVE COURSE:** NO

E. **COURSE LENGTH:** 15 WEEKS

F. **SEMESTER(S) OFFERED:** Spring of odd numbered years

G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:**
   One hour of lecture and two hours of laboratory per week

H. **CATALOGUE DESCRIPTION:** A study of the component parts of automotive air conditioning systems, their function and operation. Laboratory will consist of hands-on experience in testing, evacuation, and charging of the system. Refrigerant identification, safety, and environmental issues are addressed, along with fundamentals of manual and automatic controls.

I. **PRE-REQUISITES/CO-COURSES:**
   a. Pre-requisite(s): AUTO 112, AUTO 122
   b. Co-requisite(s): NONE

J. **GOALS (STUDENT LEARNING OUTCOMES):**
   By the end of this course, the student will:

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<th>Course Objectives</th>
<th>Institutional SLO</th>
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   | Explain Air Conditioning Principals | SLO-1: Communications Skills  
                                       | SLO-2: Critical Thinking Skills  
                                       | SLO-3: Professional Competence |
   | Classify types of automotive Air Conditioning | SLO-2: Critical Thinking Skills  
                                                | SLO-3: Professional Competence |
   | Use service information to diagnosis and repair Automotive Heating and Air Conditioning Systems | SLO-1: Communications Skills  
                                                                                     | SLO-2: Critical Thinking Skills  
                                                                                     | SLO-3: Professional Competence |
   | Operate Air Conditioning gas recovery and recycle equipment | SLO-2: Critical Thinking Skills  
                                                             | SLO-3: Professional Competence |


L. **REFERENCES:** Manufacturer Service Manuals, Alldata

M. **EQUIPMENT:** Classroom with overhead projector
N. **GRADING METHOD:** A-F, 
O. **MEASUREMENT CRITERIA/METHODS:** exams, quizzes, homework, lab performance

P. **DETAILED TOPICAL OUTLINE:**

1. Introduction
   a. Tools
   b. Safety
2. Fundamentals of Heating and Refrigeration
   a. Atomic Properties
   b. Pressure and Temperature
   c. Refrigerants and Lubricants
   d. Refrigerants and the Environment
3. Heating Systems
   a. Engine Cooling Systems
   b. Heater System Operation
   c. Cooling and Heating System Diagnosis
4. Refrigeration Systems
   a. Components
   b. Orifice Tube Systems
   c. TXV systems
   d. Refrigeration System Service
   e. Refrigeration System Diagnosis
   f. Retrofits
5. Electrical and Electronic Systems
   a. Components
   b. Compressor Control Circuits
   c. Blower Control Circuits
   d. Electrical Diagnosis
6. Air Distribution Systems
   a. Air Distribution
   b. Manual Systems
   c. Automatic Temperature Control
   d. Air Distribution Diagnosis

Q. **LABORATORY OUTLINE:**

1. Introduction
   a. Tools
   b. Safety
2. Engine Cooling Systems
   a. Component ID and Function
   b. Engine Cooling System Diagnosis
   c. Engine Cooling System Repair
3. Heater Systems
   a. Component ID and Function
   b. Heater Systems and Diagnosis
   c. Heating System Repair
4. Air Conditioning Systems
   a. Component ID and Function
   b. Metering Systems
      1. Orifice Tube
      2. TXV
   c. Recovery
   d. Evacuation
e. Recharging
f. A/C System Diagnosis
g. A/C System Repair
h. Fundamentals of Retrofitting

5. Electrical Controls
   a. Component ID and Function
   b. Compressor Controls
   c. Blower Controls
d. Diagnosis
e. Repair

6. Air Distribution
   a. Component ID and Function
   b. Manual Systems
c. Automatic Systems
d. Diagnosis
e. Repair