BUTTE COLLEGE
COURSE OUTLINE

I. **CATALOG DESCRIPTION**

AUT 23 - Automotive Heating and Air Conditioning Lab **2 Unit(s)**

Prerequisite(s): AUT 41 (or concurrent enrollment)
Co-requisite(s): AUT 22
Recommended Prep: AUT 1

Transfer Status: CSU
120 hours Lab

In this course students will develop and demonstrate the hands-on skills required to diagnose, adjust, repair and maintain modern automotive Heating, Ventilation and Air Conditioning (HVAC) and engine cooling systems. Students will use modern test equipment for diagnosis. Specific skills are developed by the use of special tools used in servicing and repair of automotive HVAC and engine cooling systems.

II. **OBJECTIVES**

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

A. Diagnose and repair HVAC system.
B. Diagnose and repair complete refrigeration system component.
C. Diagnose and repair heating, ventilation, and engine cooling systems.
D. Diagnose and repair air conditioning operating systems and related controls.
E. Perform refrigerant recovery and recycling procedures.

III. **COURSE CONTENT**

A. **Unit Titles/Suggested Time Schedule**

Topics	Lab Hours
1. Service and maintain AC service equipment	10.00
2. Perform multiple refrigerant leak detection methods	10.00
3. Practice refrigerant handling safety procedures	5.00
4. Perform ventilation system diagnostic operations	15.00
5. Perform AC service operations using recovery machines	25.00
6. Remove and replace operational components of the AC system	20.00
7. Perform service operations using engine coolant testers and flush machine	5.00
8. Pressure and performance tests on the refrigeration system	10.00
9. Perform electrical diagnosis on AC ventilation systems	10.00
10. Replace and repair electrical vacuum controls and systems	10.00
Total Hours	120.00

IV. **METHODS OF INSTRUCTION**

A. Instructor Demonstrations
B. Collaborative Group Work
C. Discussion
D. Problem-Solving Sessions

E. Multimedia Presentations
F. Laboratory Experiments

V. **METHODS OF EVALUATION**
A. Exams/Tests
B. Demonstration
C. Group Participation
D. Class participation
E. Lab Projects
F. Final Examination
G. Performance Examinations

VI. **EXAMPLES OF ASSIGNMENTS**
A. Reading Assignments
1. Read the performance specifications on refrigeration systems and servicing and be prepared to discuss in class.
2. Consult a repair publication before performing the evacuation and recharge procedure and be ready to show the instructor where you found the correct repair information or specifications.
B. Writing Assignments
1. Locate removal information of the evaporator assembly for the specific car you are working on and record the removal procedures in your lab workbook.
2. Record proper procedures for engine cooling system diagnosis and be prepared to discuss with your lab partner and instructor.
C. Out-of-Class Assignments
1. Not applicable.

VII. **RECOMMENDED MATERIALS OF INSTRUCTION**
Textbooks:
A. Halderman, J. Automotive Engines and Air Conditioning. Pearson, 2014.

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