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| **Contra Costa College** |

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| **Course Outline** |

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| **Department & Number** | AUSER 238 | **Number of Weeks** | 18 |
| **Course Title** |  Automotive Heating and Air Conditioning  | **Lecture Hours By Term** | 54 |
| **Prerequisite** |  | **Lab Hours By Term** |  |
| **Challenge Policy**  |  | **\*Hours By Arrangement** |  |
| **Co-requisite** |  | **Units**  | 3 |
| **Challenge Policy**  |  |  |  |
| **Advisory** |  |

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| **\*HOURS BY ARRANGEMENT:** |  | Hours per term.  |
|  **ACTIVITIES:** (Please provide a list of the activities students will perform in order to satisfy the HBA requirement): |
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| **COURSE/CATALOG DESCRIPTION** |

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| This course covers the fundamentals of automotive air conditioning design, construction, repair, service and diagnosis; including various systems, safety, service tools and relevant industry terminology. The course will assist with preparing for a career in the automotive industry and for the Automotive Service Excellence (ASE) A7 heating and air conditioning exam as well as the ASE refrigerant recovery and recycling certification.  |

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| **COURSE OBJECTIVES:** |
| At the completion of the course the student will be able to: |

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| Demonstrate problem solving skills and repair techniques to the engine heating and cooling system. |
| Demonstrate problem solving skills and repair techniques to the air conditioning system. |
| Demonstrate problem solving skills and repair techniques to the electrical system, vacuum and mechanical system. |
| Demonstrate refrigerant recovery and recycling techniques.  |

**INTENDED STUDENT LEARNING OUTCOMES:**

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| The student will be able to demonstrate proper safety procedures. |
| The student will demonstrate basic troubleshooting skills regarding a vehicles air condition system. |
| The student will demonstrate proper use of air conditioning gauges to check pressures in the system.  |

 **COURSE CONTENT (Lecture):**

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| Shop safety and environment best practices |
| Operation, testing and repair of vehicle heating and cooling system |
| Operation, testing and repair of vehicle air condition system |
| Refrigerant recovery and recycling techniques.  |

 **COURSE CONTENT (Lab):**

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| **METHODS OF INSTRUCTION:** |
| Lecture |
| Videos |
| Presentations |
| Demonstrations |

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| **INSTRUCTIONAL MATERIALS:** |

**NOTE:** To be UC/CSU transferable, the text must be dated within the last 7 years OR a statement of justification for a text beyond the last 7 years must be included.

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| Textbook Title: | Automotive Heating and Air Conditioning  |
| Author: | Tom Birch and Martin Duvic |
| Publisher: | Prentice Hall |
| Edition/Date: | 6th edition/2012 |
| Justification Statement: | *(For textbook beyond 7 years)* |
| Textbook Reading Level: | 9.8 |
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| Lab Manual Title  | (*if applicable*): |
| Author: |  |
| Publisher: |  |
| Edition/Date: |  |

**OUTSIDE OF CLASS WEEKLY ASSIGNMENTS:**

Title 5, section 55002.5 establishes that a range of 48 -54hours of lecture, study, or lab work is required for one unit of credit. For each hour of lecture, students should be required to spend an additional two hours of study outside of class to earn one unit of credit.

* State mandates that sample assignments must be included on the Course Outline of Record.

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|  **Outside of Class Weekly Assignments** | **Hours per week** |

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| Weekly Reading Assignments *(Include detailed assignment below, if applicable)* | 2 |

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| Weekly Writing Assignments *(Include detailed assignment below, if applicable)* | 2 |

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| Weekly Math Problems *(Include detailed assignment below, if applicable)* |  |

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| Lab or Software Application Assignments *(Include detailed assignment below, if applicable)* |  |

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| Other Performance Assignments *(Include detailed assignment below, if applicable)* | 2 |

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| Online safety and pollution modules and exams |

**STUDENT EVALUATION**: **(Show percentage breakdown for evaluation instruments)**

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| * Course must require use of critical thinking, college-level concepts & college-level learning skills.
* For degree credit, course requires essay writing unless that requirement would be inappropriate to the course objectives. If writing is inappropriate, there must be a requirement of problem-solving or skills demonstration.
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|  | **%** | Essay (If essay is not included in assessment, explain below.) |
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| 35 | **%** | Computation or Non-computational Problem Solving Skills |
|  | **%** | Skills Demonstration |
| 50 | **%** | Objective Examinations |
|  |  | Other (describe) |
| 15 | **%** | Professional practices |
|  | **%** |  |
|  | **%** |  |

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|  **GRADING POLICY: (Choose LG, P/NP, or SC)** |
|  **x** | **Letter Grade** |  | **Pass / No Pass** |  | **Student Choice** |
| 90% - 100% = A  | 70% and above = Pass | 90% - 100% = A |
| 80% - 89% = B  | Below 70% = No Pass  | 80% - 89% = B |
| 70% - 79% = C  |  | 70% - 79% = C |
| 60% - 69% = D  |  | 60% - 69% = D |
| Below 60% = F  |  | Below 60% = F |
| *or* |
| 70% and above = Pass |
| Below 70% = No Pass |
| **Prepared by:** | Lucile Beatty |

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| **Date:**  | 4/8/14 |

*Revised form 01/14*