

EL CAMINO COLLEGE – Fall 2014
ACR 21 Air Conditioning Fundamentals/Section 7108 4 Units
Lecture: 6:00pm - 9:10pm M **Lab:** 6:00pm - 9:10pm W

Course Description: This course is designed to introduce students to air conditioning and refrigeration theory and provide an overview of the skills needed for employment in the industry. Topics introduced include safety, air conditioning system operation and components, brazing, electrical applications, service tools, and equipment. An introduction to green technology, (high efficiency equipment), will be included.

Instructor: William Johnson (310) 462-4867 email: williamsair@yahoo.com

Textbook: Refrigeration & Air Conditioning Technology 7th ed. by Whitman, Johnson, Tomczyk & Silberstein
Material needed: notebook, pencils & calculator

Lecture: 6:00pm - 9:10pm M **Lab:** 6:00pm - 9:10pm W

Student materials required: notebook, pencils, and calculator. Safety glasses and work gloves will be purchased on your own.

Class Policies

1. Attendance; *students are expected to attend class regularly and will be dropped after 4 unexcused absences. Please notify instructor if you plan on missing class either by phone, text or email.*

2. Academic Honesty; *El Camino College places a high value on its student scholars. When an instructor determines that there is evidence of dishonesty in any academic work, (including but not limited to cheating, plagiarism, or theft of material), disciplinary action appropriate to the misconduct as defined in BP 5500 may be taken. A failing grade on an assignment in which academic dishonesty has occurred and suspension from class are among the disciplinary actions for academic dishonesty AP 5520. Students with any questions about Academic Honesty are encouraged to speak with their instructor.*

3. ADA Compliance Statement; *it is the policy of El Camino College to encourage full inclusion of people with disabilities inn all programs and services. Students with disabilities who believe they may need accommodations in this class should contact the Special Resources Center at (310-660-3295) as soon as possible.*

3. Grading Policy: *Tests and performance evaluations will be administered throughout the semester. Homework will be assigned and turned in as indicated by the due dates*

Grading: A = 90-100 B = 80-89 C = 70-79 D = 60-69 F = below 59

Attendance	25%
Tests	25%
Lab Work	25%
Final Exam	25%

SLO Statement 1 - After reading the required text and participating in a laboratory environment, the student will describe the refrigeration theory and identify the 4 main components that make up the refrigeration component system and their respective function

SLO Statement 2 - After reading the required text and participating in a laboratory environment, the student will demonstrate the use of specialized refrigeration tools and equipment and partake in measuring air temperature values and pressure readings.

SLO Statement 3 - After reading the required text and participating in a laboratory environment, the student will demonstrate the safe handling of low & high voltage electrical supply sources, the construction and testing of basic electrical circuits and components.

Bold dates indicate lab nights

August 2014

25 - Roll call, adds & safety test

27 - Tour of laboratory

September

01 - Labor Day (holiday)

03 - Lab project #1 introduction to tube joining process using oxy-acetylene with brazing alloy

08 - Unit 1 - Heat and Pressure Discussion

10 - Continuation of tube joining project, prepare to pressure test individual project with nitrogen and leak check with soap bubbles.

15 - Unit 2 Matter and Energy Discussion.

Introduction to the refrigeration cycle. PowerPoint presentation

17 - Complete Lab project #1. Introduction to basic electrical circuitry and test meter usage

22 - Unit 3 Refrigeration and Refrigerants Discussion.

24 - Lab project #2. Construction of basic electrical circuits and testing.

29 - Continuation of Unit 3 discussion

October

01 - Continuation of lab project #2

06 - Unit 8 Leak Detection, System Evacuation & System Clean Up

08 - Complete lab project #2

13 - Unit 9 Refrigeration and Oil Chemistry and Management

15 - Lab project #3 Introduction to the 4 main components of a compression refrigeration system

20 - Unit 10 System Charging

22 - Continuation of lab project #3 Describe the function of each main component

27 - Unit 12 Basic Electricity & Magnetism

29 - Lab project #4 Demonstrate the use of the refrigeration manifold, identify the high and low pressure dividing points in a refrigeration system

November

03 - Unit 17 Basic Electric Motors

05 - Lab project #5 Connect high voltage to a/c unit confirm power is present with DMM and perform startup of a/c unit.

10 - Continuation of Unit 17

12 - Lab project #5 Measure saturation temperature and calculate superheat and subcooling using test meters and refrigeration manifold

17 - Unit 19 Motor Controls

19 - Complete lab project #5. Discuss measured readings, results of calculations.

24 - Units 21/22 Evaporators & Condensers in the Refrigeration System Discussion.

26 - Lab project #6 - Troubleshoot electrical motors and starting devices**December**

01 - Units 23/24 Compressors & Expansion Devices Discussion

03 - Complete lab project #6

08 - Review

10 - Final Exam**Homework assignment instructions** - All questions to be written and answered in pencil, NO PENS.

Instructor reserves the right to make changes in the tentative outline / assignments if needed during the semester.

Name

Date

Unit #

Unit Number	Homework Assignment	Date Due
1	Ques. 1 - 19 pg. 26	Sept. 8
2	Ques. 1 - 31 pg. 34-35	Sept. 15
3	Ques. 1 - 22, 24 - 31 pgs. 80-81	Sept. 22
8	Ques. 1 - 24 pg. 212	Oct. 6
9	Ques. 1 - 30 pg. 250	Oct. 13
10	Ques. 1 - 22 pg. 267-268	Oct. 20
12	Ques. 1 - 20 pg. 309	Oct. 27
17	Ques. 1 - 21 pg. 427-428	Nov. 3
19	Ques. 1 - 15 pg. 457	Nov. 17
21/22	Ques. 1 - 14 pg. 497 / Ques. 1 - 18 pg. 531	Dec. 1
23/24	Ques. 1 -21 pg. 564-565 / Ques. 1 - 17 pg. 593-594	Dec. 8