



Air Condition Refrigeration System 101

Note to Instructor: Replace the placeholder text beneath the headings with the appropriate information for your course. Please note that all sections, with the exception of "Other Course Information," are required elements.

Basic Course Information

Semester:	Spring 2023	Instructor Name:	Frank Miranda
Course Title & #:	Air Cond Refrig Systems	Email:	FRANK.MIRANDA@IMPERIAL.EDU
CRN #:	20445	Webpage (optional):	
Classroom:	3115	Office #:	10
Class Dates:	02/13/2022- 06/9/ 2023	Office Hours:	Monday: 10:05 – 11:05 a.m. Tuesday: 10:05 – 11:05 a.m. Wednesday: 11:10 – 12:10 p.m. Thursday: 11:10 – 12:10 p.m. Friday: By Appointment Only
Class Days:	Monday & Wednesday	Office Phone #:	760-355-6372
Class Times:	MW: 6:00pm- 7:05pm MW: 6:00 pm – 9:10 pm	Emergency Contact:	Department office Secretary 760- 355-5758
Units:	3	Class Format:	ONLINE-ZOOM (LECTURE) FACE-TO-FACE (LABORATORY)

Course Description

This is a course of study in Heating, Ventilation, Air Conditioning, and Refrigeration trade. This course includes the study of the laws of thermodynamics, the refrigeration cycle, brazing of refrigerant lines, understanding the use of and maintenance of Heating, Ventilation, Air Conditioning, and Refrigeration equipment, applicable safety practices, and the proper use of refrigerants.

Course Prerequisite(s) and/or Corequisite(s)

N/A



Air Condition Refrigeration System 101

Student Learning Outcomes

Upon course completion, the successful student will have acquired new skills, knowledge, and or attitudes as demonstrated by being able to:

1. Perform a standing pressure test on a vessel using dry nitrogen. (ILO1,ILO2,ILO3,ILO4,ILO5)
2. Make connections with copper tubing using both low-temperature solder and high-temperature brazing material. (ILO1, ILO2, ILO3,ILO4)
3. Perform a deep vacuum test using a high-quality vacuum pump and an electronic vacuum gage. (ILO1,ILO2,ILO3,ILO4)

Course Objectives

Upon completion of this course the student will:

1. Demonstrate knowledge and understanding the laws of thermodynamics (the study of heat).
2. Demonstrate knowledge and understanding of the refrigeration cycle.
3. Demonstrate knowledge and understanding of refrigerants, and how they are used.
4. Demonstrate and apply acceptable safety practices related to air conditioning and refrigeration.
5. Demonstrate and apply knowledge of tools and equipment related to the refrigeration and air conditioning industry.
6. Demonstrate knowledge and understanding of proper soldering, brazing, and welding techniques and safety practices.
7. Demonstrate knowledge and understanding of materials, equipment, and procedures leading to a qualified technician.

Textbooks & Other Resources or Links

1. Textbook
Modern Refrigeration and Air Conditioning, 21st Edition, eBook
Author: Andrew D. Althouse, Carl H. Turnquist, A.F. Bracciano, D.C. Bracciano, and G.M. Bracciano ISBN# 978-1-63563-877-6



Air Condition Refrigeration System 101

2. Personal Protective Equipment

2.1 Safety Glasses, leather gloves, ear plugs

2.2 Work footwear, proper shirt and pants

Course Requirements and Instructional Methods

COURSE ACTIVITIES INCLUDE, LABORATORY ASSIGNMENTS, QUIZZES, CHAPTER REVIEWS, WRITTEN EXAMS, AND READING ASSIGNMENTS.

Course Grading Based on Course Objectives

A= 90%-100% Excellent

B= 80%-89% Good

C= 70%-79% Satisfactory

D= 60%- 69% Pass, less than satisfactory

F= 59%&Below Failing

The course grade will be determined by various factors such, as class participation, classroom assignments, chapter reviews & drawing project, midterm & final exams.

The grading range is as follows:

Class Participation 25%

Laboratory 25%

Midterm 25%

Final Exam 25%



Air Condition Refrigeration System 101

Course Policies

- A student who fails to attend the first meeting of a class or does not complete the first mandatory activity of an online class will be dropped by the instructor as of the first official meeting of that class. Should readmission be desired, the student's status will be the same as that of any other student who desires to add a class. It is the student's responsibility to drop or officially withdraw from the class. See [General Catalog](#) for details.
- Regular attendance in all classes is expected of all students. A student whose continuous, unexcused absences exceed the number of hours the class is scheduled to meet per week may be dropped. For online courses, students who fail to complete required activities for two consecutive weeks may be considered to have excessive absences and may be dropped.
- Absences attributed to the representation of the college at officially approved events (conferences, contests, and field trips) will be counted as 'excused' absences.
- Electronic Devices: Cell phones and electronic devices must be turned off and put away during class, unless otherwise directed by the instructor.
- Food and Drink are prohibited in all classrooms. Water bottles with lids/caps are the only exception. Additional restrictions will apply in labs. Please comply as directed by the instructor.
- Disruptive Students: Students who disrupt or interfere with a class may be sent out of the room and told to meet with the Campus Disciplinary Officer before returning to continue with coursework. Disciplinary procedures will be followed as outlined in the [General Catalog](#).
- Children in the classroom: Due to college rules and state laws, no one who is not enrolled in the class may attend, including children.

Academic honesty in the advancement of knowledge requires that all students and instructors respect the integrity of one another's work and recognize the important of acknowledging and safeguarding intellectual property.

There are many different forms of academic dishonesty. The following kinds of honesty violations and their definitions are not meant to be exhaustive. Rather, they are intended to serve as examples of unacceptable academic conduct.

- Plagiarism is taking and presenting as one's own the writings or ideas of others, without citing the source. You should understand the concept of plagiarism and keep it in mind when taking exams and



Air Condition Refrigeration System 101

preparing written materials. If you do not understand how to “cite a source” correctly, you must ask for help.

- Cheating is defined as fraud, deceit, or dishonesty in an academic assignment, or using or attempting to use materials, or assisting others in using materials that are prohibited or inappropriate in the context of the academic assignment in question.

Anyone caught cheating or plagiarizing will receive a zero (0) on the exam or assignment, and the instructor may report the incident to the Campus Disciplinary Officer, who may place related documentation in a file. Repeated acts of cheating may result in an F in the course and/or disciplinary action. Please refer to the [General Catalog](#) for more information on academic dishonesty or other misconduct. Acts of cheating include, but are not limited to, the following: (a) plagiarism; (b) copying or attempting to copy from others during an examination or on an assignment; (c) communicating test information with another person during an examination; (d) allowing others to do an assignment or portion of an assignment; (e) using a commercial term paper service.

Other Course Information

ONLINE NETIQUETTE:

- What is netiquette? Netiquette is internet manners, online etiquette, and digital etiquette all rolled into one word. Basically, netiquette is a set of rules for behaving properly online.
- Students are to comply with the following rules of netiquette: (1) identify yourself, (2) include a subject line, (3) avoid sarcasm, (4) respect others’ opinions and privacy, (5) acknowledge and return messages promptly, (6) copy with caution, (7) do not spam or junk mail, (8) be concise, (9) use appropriate language, (10) use appropriate emoticons (emotional icons) to help convey meaning, and (11) use appropriate intensifiers to help convey meaning [do not use ALL CAPS or multiple exclamation marks (!!!!)]

IVC Student Resources

Imperial Valley College offers various services in support of student success. The following are some of the services available for students. Please speak to your instructor about additional services which may be available.



Air Condition Refrigeration System 101

[Blackboard Support Site](#). The Blackboard Support Site provides a variety of support channels available to students 24 hours per day.

- [Learning Services](#). There are several learning labs on campus to assist students through the use of computers and tutors. Please consult your [Campus Map](#) for the [Math Lab](#); [Reading, Writing & Language Labs](#); and the [Study Skills Center](#).
- [Library Services](#). There is more to our library than just books. You have access to tutors in the [Study Skills Center](#), study rooms for small groups, and online access to a wealth of resources.

Anticipated Class Schedule/Calendar

Unit 1	Wk. 1	Careers and Certification
Unit 2	Wk. 2	Safety
Unit 3	Wk. 3	Service Calls
Unit 4	Wk. 4	Energy and Matter
Unit 5	Wk. 5	Gases
Unit 6	Wk. 6	Basic Refrigeration Systems
Unit 7	Wk. 7	Tools & Supplies
Unit 8	Wk. 8	Working with tubing & piping
Unit	Wk. 9	MID-TERM
	Wk. 10	<i><u>Spring break vacations</u></i>
Unit 9	Wk.11	Introduction to Refrigerants
Unit 10	Wk. 12	Equipment and Instruments for Refrigerant Handling and Services
Unit 11	Wk. 13	Working with Refrigerants
	Wk. 14	LAB
	Wk. 15	LAB
	Wk. 16	LAB
	Wk. 17	FINAL

Out of Class Assignments: The Department of Education policy states that one (1) credit hour is the amount of student work that reasonably approximates not less than one hour of class time and two (2) hours of out-of-class time per week over the span of a semester. WASC has adopted a similar requirement.

*****Tentative, subject to change without prior notice*****