

Imperial Valley College  
Industrial Technology Division  
ACR 101 Air Conditioning and Refrigeration System  
**Fall 2015**

Instructor: Frank Miranda

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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.

**Available By Appointment**

Secretary/Division Office: 10

Division Coordinator: Jose Lopez 760-355-6361 Fax: 760-355-6552

Credits/Units: 2 Lecture Hours & 3 Lab Hours (3 Units)

CRN: 10795

Semester: Aug 17, 2015 – Dec 11, 2015

Breaks/Holidays- No Classes Held

September 7	Labor Day
November 11	Veterans Day
November 26-28	Thanksgiving

Class: Monday: 8:00 a.m.–11:05 a.m.  
Wednesday: 8:00 a.m.–11:10 a.m.

Location: Room 3115

### **A. 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.

### **B. Course Objective**

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.

### **C. Course Instructional Schedule**

Unit 1	Wk. 1	Theory
Unit 2	Wk. 2	Matter and Energy
Unit 3	Wk. 3	Refrigeration and Refrigerants
Unit 4	Wk. 4	General safety practices
Unit 5	Wk. 5	Tools and Piping
Unit 6	Wk. 6	Tubing and Piping
Unit 7	Wk. 7	System and Evacuation
	Wk. 8	<b>MID-TERM</b>
Unit 8	Wk. 9	Refrigerants, oil management, recovery, recycling and reclaiming
Unit 9	Wk. 10	System charging
Unit 10	Wk. 11	Calibrating Instruments
Unit 11	Wk. 12	Evaporators and the refrigeration systems
Unit 12	Wk. 13	Condensers
Unit 13	Wk. 14	Compressors

Unit 14            Wk. 15                    Expansions devices  
                          Wk. 16                    **FINAL**

#### **D. Grading Criteria**

1. Tardiness: 3 tardies equal 1 absence (I.V.C. Gen. Catalog pg. 29-30) 2008-2009
2. Absences: (I.V.C. Gen Catalog Pg. 29-30) 2008-2009

#### **E. Exam and Grading Procedures:**

There will be a mid-term and final exam. Each will be worth 25% of the student's final grade. The student will be evaluated on classroom participation and test each week on chapters that have been assigned and/ or covered in class. These classroom assignments will be worth 25% of the student's grade. The remaining 25% of the student's grade will be based on the student's performance in the lab section of the class. All homework and tests must be completed and delivered to the instructor.

3.            Grading Systems	Percent of Overall Grade
A= 90%-100%	25% Completed Lab Assignments
B= 80%-89%	25% Completed Classroom Assignments
C=70%-79%	25% Midterm Exam
D=60%-69%	25% Final Exam
F= Less than 60%	

Review exam will be given each week on chapter being studied.

- Homework will be review questions at the end of every chapter.
- No extra credit will be assigned
- Homework will be collected weekly

Based on Attendance, Homework, Hands On, Test and Final Exam.

#### **F. Students with Disabilities**

Any student with a documented disability who may need educational accommodations should notify the instructor or the Disabled Student Programs & Services (DSP&S) office for assistance as soon as possible.

DSP&S  
Room 2117  
Health Sciences Building  
(760) 355-6313

#### **G. Equipment and Supplies**

1. Textbook  
Whitman, William, Johnson and Tomczyk John. "Refrigeration & Air Conditioning Technology." 7<sup>th</sup> Edition. Delmar Thomson Learning, ISBN: 1-4018-3765-4
2. Personal Protective Equipment

- 2.1 Safety Glasses, leather gloves, ear plugs
- 2.2 Work footwear, proper shirt and pants

#### **H. Classroom Management Procedures**

- 10 minute breaks allowed at professor discretion
- 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.
- 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.
- Please pick up after yourself before leaving room (trash cans in room and outside)

#### **I. Harassment Statement**

All forms of harassment are contrary to basic standards of conduct between individuals and are prohibited by state and federal law, as well as this policy, and will not be tolerated. The District is committed to providing an academic and work environment that respects the dignity of individuals and groups. The District shall be free of sexual harassment and all forms of sexual intimidation and exploitation.

The District seeks to foster an environment in which all employees and students feel free to report incidents of harassment without fear of retaliation or reprisal. Therefore, the District also strictly prohibits retaliation against any individual for filing a complaint of harassment or for participating in a harassment investigation. Such conduct is illegal and constitutes a violation of this policy.

(I.V.C. General Catalog 2010 – 2011)

#### **J. Student Counseling and Health Services**

Students have counseling and health services available, provided by the pre-paid Student Health Fee. We now also have a fulltime mental health counselor. For information see <http://www.imperial.edu/students/student-health-center/>. The IVC Student Health Center is located in the Health Science building in Room 2109, telephone 760-355-6310.

#### **K. Student Rights and Responsibilities**

Students have the right to experience a positive learning environment and due process. For further information regarding student rights and responsibilities, please refer to the IVC General Catalog available online at

[http://www.imperial.edu/index.php?option=com\\_docman&task=doc\\_download&gid=4516&Itemid=762](http://www.imperial.edu/index.php?option=com_docman&task=doc_download&gid=4516&Itemid=762)

### **L. Information Literacy**

Imperial Students can access tutorials at <http://www.imperial.edu/courses-and-programs/divisions/arts-and-letters/library-department/info-lit-tutorials/> Valley College is dedicated to helping students skillfully discover, evaluate, and use information from all sources.

### **M. Academic Honesty**

- 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 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 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 School 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.