

Imperial Valley College  
Industrial Technology Division  
ACR 103 Air Conditioning and Refrigeration System  
**Spring 2016**

Instructor: Frank Miranda

Phone: Cell: 760-457-5636  
Office: 760-355-6372

Email: [FRANK.MIRANDA@IMPERIAL.EDU](mailto:FRANK.MIRANDA@IMPERIAL.EDU)

Office Hours	Monday	10:40 – 11:40 a.m.
	Tuesday	10:40 – 11:40 a.m.
	Thursday	8:30 – 9:30 a.m.

**Available By Appointment**

Secretary/Division Office: 10

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

Semester: Spring 2016, February 16, 2016 - June 10, 2016

Breaks/Holidays- No Classes Held  
March 28- April 2 Spring Break

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

CRN: 20857

Class:	Monday:	6:00 – 8:05 p.m.	Lecture
	Wednesday:	6:00 – 9:10 p.m.	Lab

Location: Room 3115

## A. Course Description

Recommended preparation: ACR 101. This is a course of study in electrical circuits and controls used in the heating, ventilation, air conditioning, and refrigeration industry. This course is comprised of the study of Ohms Law, electrical meters and test equipment, wiring materials, diagrams and schematics, electrical components, installation of controls, layout of electrical circuits, and safety practices.

## B. Course Objective

Upon successful completion of this course, the student will:

- a. Demonstrate competency and mastery of the body-of-knowledge in Employee Responsibilities within the HVAC/R Industry.
- b. Demonstrate knowledge of electrical meters and electrical test equipment.
- c. Demonstrate knowledge of wiring materials.
- d. Demonstrate knowledge of wiring diagrams and schematics both pictorial and ladder.
- e. Demonstrate knowledge of electrical components used in the HVAC/R industry.
- f. Demonstrate knowledge of the techniques required to install and wire electrical.
- g. Demonstrate the ability to troubleshoot and repair electrical circuits and components.
- h. Demonstrate knowledge of safety practices required during the installation of HVAC/R electrical equipment.

## C. Course Instructional Schedule

Unit 12	Wk. 1-2	Basics electricity and magnetism
Unit 13	Wk.3-4	Introduction to automatic controls
Unit 14	Wk. 5-6	Automatic control components and applications
	Wk. 7	MID-TERM
Unit 15	Wk. 8-9	Troubleshooting basic controls
Unit 16	Wk. 10-11	Electronic and programmable controls
Unit 17	Wk. 12	Types of electric motors
Unit 18	Wk. 13	Application of motors
Unit 19	Wk. 14	Motor controls
Unit 20	Wk. 15	Troubleshooting Electric Motors
	Wk. 16	FINAL

- 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

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

- a. Tardiness: 3 tardies equal 1 absence (I.V.C. Gen. Catalog) 2010-2011
- b. Absences: (I.V.C. Gen Catalog) 2010-2011

#### **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.

<b>Grading Systems</b>	<b>Percent of Overall Grade</b>
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%	

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) 355-6312

#### **G. Student Learning Outcome**

I.V.C. as an institution has adapted five Student Learning Outcome (SLO's). They are inter-connected with each other. They will be inherent throughout this course.

1. communication skills
2. crucial thinking skills
3. personal responsibilities
4. information literacy

5. global awareness

## **H. Classroom Management Procedures**

1. The use of cell phones is prohibited during instruction time,
2. 10 minute breaks allowed at professor discretion,
3. Tardiness and early departure is loss of credits.
4. Call-in if absence or tardy 2 hours before class time.
5. Please pick up after yourself before leaving room (trash cans in room and outside)

Safety rules and other procedures are found in the I.V.C. Gen. Cat. 2010-2011

## **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. Resources, Library, Counseling, Parking, etc.**

Refer to the I.V.C. Gen. Cat. 2010 - 2011

## **K. Equipment and Supplies**

- a. Textbook  
Whitman, William, Johnson and Tomczyk John. "Refrigeration & Air Conditioning Technology." 7<sup>th</sup> Edition. Delmar Thomson Learning, ISBN: 1-4018-3765-4
- b. Personal Protective Equipment
  - 2.1 Safety Glasses
  - 2.2 Leather Gloves
  - 2.3 Ear plugs
  - 2.4 Work footwear
  - 2.5 Proper shirt and pants