

Basic Course Information

Semester	Spring 2015	Instructor Name	Francisco Mayoral (P) Jesus Hernandez
Course Title & #	Electrical Wiring & Protection	Email	Francisco.mayoral@imperial.edu Jesus.Hernandez@imperial.edu
CRN #	20037	Webpage (optional)	
Room	3113	Office	Part-Timers:
Class Dates	Feb 17 to June 12, 2015	Office Hours	n/a for part-time faculty
Class Days	Monday and Wednesday	Office Phone #	
Class Times	8:30 – 10:35 am 10:35 – 12:45 pm	Office contact if student will be out or emergency	Dept Secretary is an option
Units	4 units		

Course Description

This course covers wiring installation and connection for conductor termination and splices; use of cable pulling instruments and NEMA and NEC standards for cable tray; installation of electrical service and electrical protection components and equipment; use of material take-off methods and troubleshooting techniques; identification of ratings for current breakers and fuses; regulations for sizing and installation of relay switches, conductors and overrides and application.

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. Recognize the different conductor systems used in residential and light commercial wiring in accordance with the codes and authorities for installation. (ILO1, ILO2, ILO4) .
2. Use the NEC to adjust conductor ampacity based on ambient temperature and number of conductors of raceway systems. (ILO2, ILO4)
3. Explain the causes of over current conditions and describe electrical circuit over current protective devices (OCPDs). (ILO1, ILO2, ILO3, ILO4, ILO5)
4. List the components of the service entrance, service drop clearances specified in the NEC, and eight basic guidelines when locating a residential service entrance. (ILO2, ILO4, ILO5)

Course Objectives

Upon satisfactory completion of the course, students will be able to:

1. Demonstrate and practice electrical safety.
2. Plan, set up for and install a cable pull, and properly install a pull line for a cable-pulling operation.
3. Describe the mechanism for making correct conductor terminations and grounding continuity.
4. Describe the types of electrical services for commercial and industrial installations.
5. Interpret electrical blueprints and diagrams describing service installations.
6. Compute circuit loads, number of circuits required, and the installation requirements of distribution panels.
7. Describe the different types of service connections, GFI, and service grounding.
8. Describe the operation of electro-mechanical conductors and solid state relays.
9. Read diagrams involving conductors and relays, and connect and test a simple control circuit.

10. Interpret lighting layouts on commercial and industrial blueprints; interpret light fixtures and schedules.

Textbooks & Other Resources or Links

1. **Modern Residential Wiring 10th Edition by Harvey N. Holzman. ISBN. 978-1-61960-842-9**
2. **Modern Residential Wiring 10th Edition by Harvey N. Holzman. (Workbook) . ISBN**
3. **2014 NEC manual, National Electric Codes**

Course Requirements and Instructional Methods

Below is the instructional Scale:

Breakdown (100 points)

Reviews: 20%

Shop practices: 30%

Midterm: 25%

Final: 25%

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.

Course Grading Based on Course Objectives

The course grade is based on total points accumulated during the semester. There is a maximum of 100 points.

Very limited extra credit points may be available, either through some class participation activity, group work or perfect attendance. Failing to turn in regular assignments will stop you from being able to earn extra credit points and late assignments will have points subtracted.

Final Grades are calculated as follows:

Grade Points

A 90-100

B 80-89

C 70-79

D 60-69

F Below 60

Grading Rubrics: In addition to the percentages and points listed above the following grading rubric (standards expected) will be used when grading student assignments. The description that best fits your work will be the assigned grade.

Grade Rubric or Standard Expected

- A** Focused and clearly organized. Contains advanced critical thinking and analysis. Convincing evidence is provided to support conclusions. Clearly meets or exceeds assignment requirements.
- B** Generally focused with some development of ideas, but may be simplistic or repetitive. Evidence is provided to support conclusions. Occasional grammatical errors. Meets assignment requirements, but does not exceed.
- C** Unfocused, underdeveloped, or rambling, but has some coherence. Minimal evidence is provided to support conclusions. Several grammatical errors. Meets
- D** Unfocused, underdeveloped, and/or rambling. Limited evidence is used to support conclusions. Serious grammatical errors that impede overall understanding. Does not address the assignment requirements
- F** Unfocused, underdeveloped, and/or rambling. Incomplete or too brief. No evidence is

used to support conclusions. Serious grammatical errors that block overall understanding. Does not meet assignment requirements. Minimal to no student effort.

This section is where faculty would list their grading practices and grading scale, including point values and totals. Consider adding: final grade calculation, rubrics, late assignments, and other grading practices.

Attendance

- 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.

Classroom Etiquette

- Electronic Devices: Cell phones and electronic devices must be turned off and put away during class, unless otherwise directed by the instructor. **Consider:** specifics for your class/program
- 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.

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.

Additional Help – Discretionary Section and Language

- **Blackboard** support center: <http://bbcrm.edusupportcenter.com/ics/support/default.asp?deptID=8543>
- **Learning Labs:** There are several ‘labs’ on campus to assist you through the use of computers, tutors, or a combination. Please consult your college map for the Math Lab, Reading & Writing Lab, and Study Skills Center (library). Please speak to the instructor about labs unique to your specific program.
- **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.

Disabled Student Programs and Services (DSPS)

Required Language: Any student with a documented disability who may need educational accommodations should notify the instructor or the Disabled Student Programs and Services (DSP&S) office as soon as possible. The DSP&S office is located in Building 2100, telephone 760-355-6313, if you feel you need to be evaluated for educational accommodations.

Student Counseling and Health Services

Required Language: 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.

Student Rights and Responsibilities

Required Language: 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

Information Literacy

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

Anticipated Class Schedule / Calendar

The instructor will provide a tentative, provisional overview of the readings, assignments, tests, or other activities for the duration of the course. The faculty may find a table format useful for this purpose.

Date or Week	Activity, Assignment, and/or Topic	Pages/ Due Dates/Tests
Week 1 Feb 18	Syllabus & Introduction Electrical Safety	Pag 15 to 23 Review/WB
Week 2 Feb 23-24	Electrical Prints and Specifications, wiring circuits, cable installations, cable pulling and supports	Pag 191 -222 Review and W/Book
Week 3 March 2-4	Appliance Wiring and Special Outlets ,residential, commercial and industrial.	Pag 225 Review and W/Book
Week 4 March 9-11	National Electrical Codes (NEC-2014) and local regulations interpretation	NEC-2014 Edition

Imperial Valley College Course Syllabus – Electrical Wiring & Protection EWIR 115

Week 5 March 16-18	Branch-Circuit,Feeder,and Service Design;number of branch circuits,service load calculations,balancing circuit loads	Pag 211 to 222 Review and W/Book
Week 6 March 23-25	Switches Panels Board;load center,sub panels,and overcurrent protection	Pag 147 Review and Search
Week 7 March 30, April 1	Farm Wiring; power distribution,wiring methods Spring break April 5 to 12	Pag 235 Review and W/Book
Week 8 April 13-15	Mobile Home Wiring ; distribution panelboard,feeder assembly,mobile home service equipment,mobile home parks	Pag 243 to 250 Review and W/Book
Week 9 April 20-22	Solis State,Relays,magnetig,switching and controls. Mid term examination April 22	Midterm exam
Week 10 April 27-29	Swimming Pool Wiring ; bonding,grounding,receptacles,switches,lighting,equipment	253 to 258 Review and W/Book
Week 11 May 4-6	Telephone and Computer Network Wiring ; Systems Overview,installation,other sytems.	Pag 261 to 270 Review and W/Book
Week 12 May 11-13	Motors ; types of motors,motor nameplate,proper size of motor feeder conductors,protection of motors, general layout. Dead line to drop with "W" May 16	Pag 273 to 277
Week 13 May 18-20	Motors conti.; controller requirements,motor duty,selectring the proper size disconnect,motor installations tips	Pag 278 to 283 Review and W/Book
Week 14 May 27	Emergency and Standby Systems ; safety,emergency standby systems,generators size,portable and permanent generators. May 25 holiday	Pag 293 to 298 Review and W/Book
Week 15 June 1-3	Electrical Remodeling ; basic considerations,safety,special tools,materials and installations. Maintenance and Troubleshooting ; safety considerations, Proper tools,diagnosing problems.	Pag 301 to 310 Pag 315 to 316 Review and W/B
Week 16 June 8-10	Course Core Makeup for Final Exam Final Examination Final exam June 10	