



IMPERIAL VALLEY COLLEGE

**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:         | <b>Spring 2021</b>               | Instructor Name:    | <b>Eduardo Flores</b>      |
| Course Title & #: | <b>Hydro Operator Apprentice</b> | Email:              | <b>EFlores@iid.com</b>     |
| CRN #:            | <b>APHY 107</b>                  | Webpage (optional): | <b>Imperial.edu</b>        |
| Classroom:        | <b>Drop 4 Training Trailer</b>   | Office #:           | <b>760-339-9632</b>        |
| Class Dates:      | <b>Feb 16 to June 11 2021</b>    | Office Hours:       | <b>4:00 pm to 8:30 pm</b>  |
| Class Days:       | <b>Tuesdays</b>                  | Office Phone #:     | <b>760-339-9679</b>        |
| Class Times:      | <b>4:00 pm to 8:30 pm</b>        | Emergency Contact:  | <b>Drop 4 Control Room</b> |
| Units:            | <b>4</b>                         | Class Format:       |                            |

### Course Description

*[Paste in the course description from the Course Outline of Record (COR), located at*

*<https://imperial.curricunet.com/Search>*

- Advanced theory in the use of rules and regulations, specialized equipment, repair and maintenance of hydro-generators, safety practices, local and state requirements, and control systems. (Nontransferable, nondegree applicable)

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

Successful completion of AP Hydro 106 with a "C" or better.

### Student Learning Outcomes

*[Paste in the course student learning outcomes from the COR, located at <https://imperial.curricunet.com/Search>*

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

1. become familiar with safety regulations and personal protective equipment related to live electrical conductor exposure and arc flash protection. Hazardous materials control and disposal including asbestos materials. (ILO2, ILO3)
2. describe the different types of hydro power generators construction, identifying components including: frame, polar wheel, stator windings, slip rings, voltage regulator, bearings and cooling system components. (ILO1, ILO2, ILO3)
3. explain hydro generator related processes: excitation, grid synchronization, load and reactive power controls, generator protections up to include electrical and mechanical instrumentation. (ILO1, ILO2)

demonstrate proficiency in monitoring and relating problems and parameters associated with generator controls during start up and under operation. (ILO2, ILO3)

## Course Objectives

[Paste in t] Upon satisfactory completion of the course, students will be able to:

1. Practice standard safety procedures appropriate to the power utility industry.
2. Recognize and deal appropriately with hazardous materials in the power utility industry.
3. Identify and resolve turbine loss and outages through given troubleshooting techniques.
4. Implement and maintain care of monitoring systems.
5. Implement and maintain care of digital systems.

Identify and demonstrate practical uses of other safety equipment (ie blankets). *he course objectives from the COR, located at <https://imperial.curricunet.com/Search>*

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

1. become familiar with safety regulations and personal protective equipment related to live electrical conductor exposure and arc flash protection. Hazardous materials control and disposal including asbestos materials. (ILO2, ILO3)
2. describe the different types of hydro power generators construction, identifying components including: frame, polar wheel, stator windings, slip rings, voltage regulator, bearings and cooling system components. (ILO1, ILO2, ILO3)
3. explain hydro generator related processes: excitation, grid synchronization, load and reactive power controls, generator protections up to include electrical and mechanical instrumentation. (ILO1, ILO2)

demonstrate proficiency in monitoring and relating problems and parameters associated with generator controls during start up and under operation. (ILO2, ILO3)

## Textbooks & Other Resources or Links

[Describe which textbooks and/or other resources are required for the course. Be sure to include ISBN.]

- Callahan, Michael and Bill Wusinich 2017. *Electrical Systems Based on the 2017 NEC* 1st. American Technical Publishers ISBN: 978082692034.
- Shoemaker, Thomas M. and James E. Mack 2017. *The Lineman's and Cableman's Handbook* 13th. New York. McGraw-Hill ISBN: 978-0071850032.
- Electrical Lineman Training Committee 2009. *Imperial Irrigation District's Lineman Apprenticeship Training Handbook* Revised. Imperial, CA. Imperial Irrigation District ISBN: -.

Joint Apprenticeship Committee 2009. *Hydro-Electric Program Standards* Imperial, CA. Imperial Irrigation District ISBN: -.

## Course Requirements and Instructional Methods

[Describe Activity

Essay

Mid-Term/Final Exam(s)

Objective

Oral Assignments

Problem Solving Exercise

Quizzes

Skill Demonstration

Written Assignments *course activities, assignments, tests, homework, etc.*]

### Course Grading Based on Course Objectives

90-100% = A

80-89% = B

70-79% = C

60-69% = D

Below 60% = F

**=Example only – please customize =**

There are 13 quizzes ( 25 pts. each )

2 overview classes worth 25 pts.

1 mid-term ( 50 pts. )

1 final exam. ( 100 pts. )

Total of 500 pts. Total accumulated points are divided by 500 to arrive at percentage score.

### Academic Honesty

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 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 IID policy and procedures 4530 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.

## 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.
- 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, only students enrolled in the class may attend; children are not allowed.

## Online Etiquette

- 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 (!!!!)].
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## Student Rights and Responsibilities

Students have the right to experience a positive learning environment and to due process of law. For more information regarding student rights and responsibilities, please refer to the IVC [General Catalog](#).

## IVC Student Resources

IVC wants you to be successful in all aspects of your education. For help, resources, services, and an explanation of policies, visitor click the heart icon in Canvas.

## Anticipated Class Schedule/Calendar

*[Provide a tentative overview of the readings, assignments, tests, and/or other activities for the duration of the course. A table format as in the example below may be used for this purpose.]*

| Date or Week          | Activity, Assignment, and/or Topic                  | Pages/ Due Dates/Tests |
|-----------------------|---|------------------------|
| Week 1<br>February 16 | Syllabus & Introduction<br>Environmental Compliance | Hazmat Handouts        |
| Week 2<br>February 23 | Flashouts and Electrical Burns                      | Energy Safety Handouts |
|                       |   |                        |
|                       |   |                        |

**\*\*\*Subject to change without prior notice\*\*\***

|                     |  |                                   |
|---------------------|--|-----------------------------------|
| Week 3<br>March 2   | Introduction to the tor<br>Generator Hydro Genera<br>Construction Part I   | HEP 6 Seg. A - Quiz               |
| Week 4<br>March 16  | Generator Construction Part II   | HEP 6 Seg. B - Quiz               |
| Week 5<br>March 23  | Generator Fundamentals – Review  | HEP 6 Seg. C - Quiz               |
| Week 6<br>March 30  | Week 2<br>Aug. 27, 2020  | Flashouts and Electrical<br>Burns |
| Week 7<br>April 6   | Spring break<br>Excitation Systems & Synchronizing Part II   | HEP 6 Seg. D – Quiz               |
| Week 8<br>April 11  | AP Hydro 107 Mid Term Examination HEP 6<br>Introduction to Generator Monitoring & Control – HEP 7<br>Control of Active & Reactive Power Output | HEP 7 Seg. A - Video              |
| Week 9<br>April 18  | Control of Active & Reactive Power Output – “Continued”  | HEP 7 Seg. A - Quiz               |
| Week 10<br>April 27 | Monitoring Generator Operations  | HEP 7 Seg. B - Video              |
| Week 11<br>May 4    | Monitoring Generator Operations – “Continued”  | HEP 7 Seg. B - Quiz               |
| Week 12<br>May 11   | Digital Control Systems  | HEP 7 Seg. C - Video              |
| Week 13<br>May 18   | Digital Control Systems – “Continued”  | HEP 7 Seg. C - Quiz               |
| Week 14<br>May 25   | Generator Electrical Protection  | HEP 7 Seg. D – Video              |
| Week 15             | Generator Electrical Protection – “Continued”  | HEP 7 Seg. D – Quiz               |



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|                   |  |                     |
|-------------------|--|---------------------|
| June 1            | Review Of HEP 6 & HEP 7 & Quizzes For Final Exam | Lecture & Questions |
| week 16<br>June 8 | APHY 107 Final Examination                       |                     |