



Basic Course Information

Semester:	Spring 2021	Instructor Name:	Kerry Messenger
Course Title & #:	Instrument Technician 108	Email:	klmessenger@iid.com
CRN #:	CCRN #11441	Webpage (optional):	Imperial.edu
Classroom:	ECGS Maintenance building lunch room	Office #:	Imperial Irrigation District
Class Dates:	Feb 16 – June 11	Office Hours:	
Class Days:	Tuesday	Office Phone #:	(760) 339-0755
Class Times:	4:00 P.M. to 8:30 P.M.	Emergency Contact:	
Units:	4	Class Format:	

Course Description

Advanced instruction in inspecting, adjusting and repairing electrically and pneumatically operated instruments used to indicate and control operating conditions of turbines, furnaces, boilers and auxiliaries in steam, gas, and hydro generating plant. (Nontransferable, nondegree applicable)

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

Successful completion of Instrument Technician 107 with a "C" or better.

Student Learning Outcomes

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

1. Practice electrical safety when working on or near energized equipment
2. Understand alternative energy sources, solar, wind and geothermal
3. **Understand PLC and DCS programming Basics, PLC control systems, and distributed control systems.**
4. Interpret and understand generation automation control and related systems
5. Interpret principles of automation process control instruments
6. **Understand and practice proper calibration methods**
7. Understand automatic process control valves
8. Understand temperature measuring and control instrument
9. Interpret liquid level measuring and control instruments
10. **Understand basics of automatic combustion control**
11. Understand flue gas analysis
12. **Understand basic power plant water treatment**
13. **Interpret predictive maintenance: basic vibration analysis**

Course Objectives

Electrical Safety When Working on or Near Energized Equipment

1. Alternative energy sources, solar, wind and geothermal

B. Automation Process Control and Electronic Components

1. **Basic programming Distributed Control Systems, and Programmable Control Systems.**
2. Computer-aided control systems



C. Generation Automation Control and Related Systems

1. Principles of automation process control instruments
2. Pneumatic instrumentation
3. Temperature measuring, control instrument, and calibration methods
4. Liquid level measuring, control instrument, and calibration methods
5. Basics of automatic combustion control
6. Flue gas analysis
7. Basic power plant water treatment
8. Predictive maintenance: basic vibration analysis

Textbooks & Other Resources or Links

- Kirk, Franklyn W., Weedon, Thomas A., and Kirk, Philip 2011. *Instrumentation* 5th. Homewood, Illinois. American Technical Publishers, Inc ISBN: 978-0826934307.
- Walt Boyes 2010. *Instrumentation Reference Book* 4th. Butterworth-Heinemann ISBN: 978-0750683081.

Course Requirements and Instructional Methods

Assignments are designed to elicit your demonstration of critical thinking, understanding and application of the course concepts, and your proficiency in the subject matter.

Required Activities or Assignments

1. Quizzes (9)
2. Exams (2)
3. Drawings (17)
4. Presentation (14)

Teaching Methods: During this class, you will have opportunity to participate in a variety of presentation and teaching methods. Lectures, including material not covered in your readings, class and group discussions requiring your active participation, student oral presentations, field trips will supplement your required readings.

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. Out of class assignments for this course includes reading assignments, study time for exams/quizzes, and completion of required course assignments. Students should actively read the assignment prior to class, bring any questions to class, and take careful notes during class.

Course Grading Based on Course Objectives

Grading Criteria: Letter grade only

Grading policy:

The student's grade will depend on the following areas:

Homework assignments/quiz	34%	=170 points
Class presentation /attendance	16%	= 80 points
Mid-term	25%	=125 points
Final exam	25%	=125 points
Total	100%	=500 points

All grades are calculated by the standard scale:

A=100-90% B=89-80% C=79-70% D=69-60% F=59% and below

The course grade is based on total points accumulated during the semester. There is a maximum of 500 points.

Final Grades are calculated as follows:

Percentage	Grade
90-100%	A
80-89%	B
70-79%	C
60-69%	D
Below 60%	F

Points	Grade
450-500	A
400-449	B
350-399	C
300-349	D
0-299	F

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 minimum assignment requirements.
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.

Late assignments will not be accepted. Student will hand in assignment the week it is due.
Students will not be allowed to take missed, quizzes, mid-term exam or final exam.

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 (!!!)].

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

	SUBJECT	Homework	ASSIGNMENT DUE
Week 1 02/16/2021	Presentation Alternative power Sources Principals of Automation Process control Instruments	Hand out	
Week 2 02/23/2021	Temperature, Heat and Energy Thermal Expansion	Chapter 4 & 5 OF TEXTBOOK 1 Questions in workbook on these chapters. Review Chapter 21 of Textbook 2	03/02/2021
Week 3 03/02/2021	Electrical Thermometers	CHAPTER 6 OF TEXTBOOK 1 Questions in workbook on these chapters.	03/09/2021
Week 4 03/09/2021	Infrared Radiation Thermometers	CHAPTER 7 OF TEXTBOOK Questions in workbook on these chapters.	03/16/2021
Week 5 03/16/2021	Practical Temperature Measurement and Calibration	CHAPTER 8 OF TEXTBOOK Questions in workbook on these chapters.	03/23/2021
Week 6 03/23/2021	Mechanical Level Measurement	CHAPTER 13 OF TEXTBOOK Questions in workbook on these chapters. Review Chapter 10 of Textbook 2	03/30/2021
Week 7 03/30/2021	Presentation on Software and Programming. Review for Mid-Term		



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Week 8 04/04/2021	MID-TERM EXAM		
Week 9 04/13/2021	Electrical Level Measurement	CHAPTER 14 OF TEXTBOOK Questions in workbook on these chapters.	04/27/2021
Week 10 04/20/2021	Spring Break	No Class	
Week 11 04/27/2021	Ultrasonic, Radar, and Laser Level Instruments	CHAPTER 15 OF TEXTBOOK Questions in workbook on these chapters.	05/04/2021
Week 12 05/04/2021	Nuclear Level Instrument and Weight Systems. Practical Level Measurement and Calibration.	CHAPTER 16 & 17 OF TEXTBOOK Questions in workbook on these chapters. Review Chapter 29 & 30 of Textbook 2	05/11/2021
Week 13 05/11/2021	Gas Analyzers Humidity and Solid	CHAPTER 23 OF TEXTBOOK Questions in workbook on these chapters. Review Chapter 25 of Textbook 2	05/18/2021
Week 14 05/18/2021	Moisture Analyzers	CHAPTER 24 OF TEXTBOOK Questions in workbook on these chapters. Review Chapter 26 of Textbook 2	05/25/2021
Week 15 05/25/2021	Electro Chemical and Composition Analyzers	CHAPTER 25 & 26 OF TEXTBOOK Questions in workbook on these chapters. Review Chapter 24 of Textbook 2	06/01/2021
Week 16 06/01/2021	Review for final exam		
Week 17 06/08/21	Final exam		

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