Basic Course Information

Semester	**Fall 2013**	Instructor	**Jimenez, Javier**
Course Title & #	**Digital Instrumentation Measurements / ELTR-220**	Email	**Javier.Jimenez@imperial.edu**
CRN #	**10326**	Website	
Room	**1307**	Office	
Class Dates	**19 AUG 2013 to 07 DEC 2013**	Office Hours	
Class Days	**Fridays**	Phone #	
Class Times	**1000-1205pm** **1215-0325pm**	Contact for absence or emergency	**Javier.Jimenez@imperial.edu**

Course Description

Advanced concepts in electronics. Topics will include: additional devices included in circuits, instrumentation, various system designs, successive "generations". (CSU)

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. Describe the functions of Operational Amplifiers in different configurations. (ILO2, ILO4, ILO5)
2. Analyze Instrumentation Circuits with Operational Amplifiers with different types of sensors. (ILO2, ILO4, ILO5)
3. Construct, Test, and troubleshoot various instrumentation circuits using Op-Amps and A/D converters. (ILO2, ILO4, ILO5)
4. Write and design software programs based on microcontrollers for measuring various physical variables. (ILO2, ILO4, ILO5)

Course Objectives

MEASURABLE COURSE OBJECTIVES AND MINIMUM STANDARDS FOR GRADE OF "C":
Upon satisfactory completion of the course, students will be able to:

1. Identify the various types and characteristics of thermionic tubes, and describe the limitations and problems encountered during operation of these devices.
2. Compare and contrast the newer solid-state devices such as photosensitive and piezoelectric components.
3. Apply digital design instrumentation techniques to various measurement situations.
4. Construct various system designs and propose an interfacing arrangement for two or more systems.
5. Evaluate the changes occurring in audio and video design and employ these advances in system design.
6. Compare time and frequency-based hybrid systems, and rate the efficiency of the systems.
7. Analyze the new devices and systems proposed by authors in journals and trade magazines, and appraise the value of these advances for re-design of systems.

Textbooks & Other Resources or Links

1. Bartelt, Terry, L. M. (2007). Instrumentation and Process Control (1/e). New York Thomson Del Mar Learning. ISBN: 978-1-4180-4171-7

2. Mims, Forrest. The Engineer's Notebook. High Text Publications , 09-01-2007.
3. Magazines:
4. Sensors Magazine, www.sensorsmag.com

5. Electronic Design Magazine. www. electronicdesign.com

6. EDN magazine. www.edn.com

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:

Points	Grade
90-100	A
80-89	B
70-79	C
60-69	D
Below 60	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 be accepted until the graded assignment is returned to the class, but assessed a penalty of 10 points per calendar day it is late.

Course Assignments 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	Points
1. Homework, Assignments:	10
2. Laboratory Experiments:	20
3. Laboratory Reports:	10
3. Mid-Term Exam:	30
4. Final Exam:	30

Teaching Methods: Discussion of assignments and instructional methods will be a combination of all methods of instruction, which can be classified as telling, lecturing, or discussing; showing or demonstrating.

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.

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.
- 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.

Academic Dishonesty

- Plagiarism is to take and present 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 clearly understand how to correctly 'cite a source', 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, or assisting others in using materials, which are prohibited or inappropriate in the context of the academic assignment in question. Anyone caught cheating will receive a zero (0) on the exam or assignment, the incident will be reported to the division dean and the dean of Student Affairs, and a document may be placed 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:
  - plagiarism
  - copying or attempting to copy from others during an examination or on an assignment;
  - communicating test information with another person during an examination;
  - allowing others to do an assignment or portion of an assignment

- use of a commercial term paper service

Classroom Etiquette

- Electronic Devices: Cell phones and electronic devices must be turned off and put away during class. Cell phones ringing during class and all electronic devices not put away will be held by the instructor until the end of class as these disruptions are considered disrespectful behavior to others in the class and 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: Most of you are here to learn, but some students are not as serious. To preserve a productive learning environment, 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.

Additional Help

- 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 Learning Services (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 learning center, study rooms for small groups, and online access to a wealth of resources.

Disabled Student Programs and Services (DSPS)

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 760-355-6312 if you feel you need to be evaluated for educational accommodations.

Student Counseling and Health Services

Students have counseling and health services available, provided by the pre-paid Student Health Fee. You can find out more about services available for students at 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

Students have the right to experience a positive learning environment; students who disrupt that environment can be asked to leave the class. Faculty and students also have the right of due process. For further information regarding student rights and responsibilities please refer to the IVC General Catalog available online at www.imperial.edu

Class Schedule

Below is a list of weekly activities and assignments that will assist you in meeting the course objectives and the Student Learning Outcomes. Please review carefully and often as the list may reading assignments, exams, field trips, projects, presentations, etc.

Date	Activity, Assignment, and/or Topic	Assignment Due
August 23-30	Syllabus & Introduction Introduction to Operational Amplifiers (Op-Amps)	

September 6-13	Basic Applications of Op-Amps	
September20-27	Amplifiers and Oscillators	
October 4	Integrators, Differentiators, and filters with Op-Amps	
October 4	Review for Mid Term Exam	
October 11	Mid Term Exam	
October 18-25	Logic Oscillators and interfacing arrangements	
November 1-8	Sensors and transducers	
November 15	Digital converters and instrumentation	
November 22	Analysis of redesigned systems	
November 22	Review for Final Exam	
December 6	Final Exam	