Instructor: Dr. Zekeriya Aliyazicioglu  
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Office: BLDG 9 – 143  
Office Hours: T 1:00 PM - 3:00 PM, W 1:30 PM - 3:30 PM  
Class Time/Place: M, W 8:00 AM – 9:15 AM / BLDG 9 - 423  
Quarter: Summer 2016

Course Description:  
An introduction to network analysis in the time domain with computer applications.  
3 lectures/problem-solving. Prerequisite: C or better in ECE 109, and ECE 109L, ECE 114, MAT 216, PHY 133, and ENG 107 or ENG 109 or ENG 110.  
Note: Students are responsible for satisfying the required prerequisite(s).

Course Outcomes:  
The student will be able to:  
1. To analyze inverting, non-inverting, summing, and differencing amplifier circuits in the time domain.  
2. To compute the current, voltage, power, and energy corresponding to inductors/capacitors in the time domain.  
3. To compute the equivalent inductance/capacitance of circuits with series-parallel combination inductance and capacitance in the time domain.  
4. To obtain the transient response of any RL or RC circuit configurations whose parameter of interests, such as the current in the inductor or the voltage in the capacitor, results in a first order differential circuit in the time domain.  
5. To obtain the transient response any RLC circuit configurations whose parameter of interests, such as the current in the inductor or the voltage in the capacitor, results in a second order differential circuit in the time domain.  
6. To analyze integrating and differentiating amplifier circuits in the time domain.

Text Book:  
ISBN:13 9780073380575

References:  

Course Requirements and Evaluation Procedure  
1. Homework(s)/Computer Problems: Homework/computer problems will be assigned ahead of time so that students would have chance to read the related topic(s). Homework/computer problems assignments will be due at the beginning of the class of the class on the date specified. Absolutely no late homework/computer problems will be accepted, if not accompanied with a legitimate excuse. All work on the homework/computer problems assignments must be individual. Homework, Computer Problems, Quizzes, and Final Project represents 30% of the course grade.

2. Exam(s): Three examinations will be administered.
Exam 1 represents 20% of the course grade,
Exam 2 represents 25% of the course grade, and
Final Exam represents 25% of the course grade.

Note: Students are responsible for all materials/announcements presented in class whether they are present or absent.

Outline

Week 1
Operation amplifier circuits
Introduction to operational amplifier (black box approach)
Inverting amplifier circuit

Week 2
Non-inverting amplifier circuit
Summing amplifier circuit
Differencing amplifier circuit

Week 3
Inductors and Capacitors
Inductor: voltage, current, power, and energy computation corresponding to an inductor in the time domain

Week 4
Capacitor: voltage, current, power, and energy computation corresponding to a capacitor in the time domain.
Series-parallel combinations with inductors/capacitors. Computation of equivalent inductance/capacitance

Week 5
Exam 1
Introduction to RL circuits: natural and step response of RL circuits
Introduction to RC circuits: natural and step response of RC circuits

Week 6
A general solution for natural and step responses
Sequential switching

Week 7
Unbounded responses
An integrating (or differentiating) amplifier circuit

Week 8
Natural response of parallel a RLC circuit: (overdamped, critically damped and underdamped cases)

Week 9
Step response of parallel a RLC circuit: (overdamped, critically damped and underdamped cases)
Exam 2

Week 10
Natural and step response of a series RLC circuit: (overdamped, critically damped and underdamped cases)
A circuit with two integrating operational amplifiers

Final Exam

1. Schedule may be subject to change. Please note the announcements in the class, in the class folder,
and in the instructor’s web site, etc.
2. Solutions to the problems (exercises, tests, etc.) may be published if time permitting.

Course Policies

- Students must have the pre/co requisites for ECE 109 as given above.
- No make-up tests will be given.
- Students are encouraged to discuss the course, including issues raised by the assignments. However, the solutions to assignments should be individual original work unless otherwise specified. You may ask a fellow student a question designed to improve your understanding, not one designed to get the assignment done. To do otherwise is to cheat yourself out of understanding, as well as to be dishonorable.
- Cheating and/or plagiarism in this class will earn you an automatic “0” on the assignment or exam, and I will also report you to the university. For more information on the University’s policy regarding cheating and plagiarism, refer to Cal Poly’s website http://www.cpp.edu/~studentconduct/academic-integrity-resources/academic-integrity.shtml