ECE 109 - 02 Introduction to Electrical Engineering

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Office: BLDG 9 – 406
Office Hours: M-W 9:30 AM – 11:00 AM, T-T 1:00PM – 3:00 PM
Class Time/Place: M-W 1:30 PM – 2:45 PM / BLDG 9 - 117 Quarter: Spring 2014

Course Description:
Introduction to the fundamental laws of electrical engineering, applications to circuit analysis, matrix methods. 3 lectures/problem-solving. Prerequisites: C or better in MAT 114, Co-requisite: ECE 109L

Note: Students are responsible for satisfying the required prerequisite(s).

Course Outcomes:
The student will be able to:
1. Apply the basic units of voltage, current, power, energy
2. Use the relationship between voltage and current in a circuit element (Ohm’s Law)
3. Determine the currents and voltages in a resistive network using Kirchhoff's Voltage Law
4. Determine the currents and voltages in a resistive network using Kirchhoff’s Current Law
5. Compute the equivalent resistance of a resistor network; Y-Δ and Δ -Y network conversions.
6. Use voltage and current dividers to simply network analysis.
7. Write mesh and/or node equations for an arbitrary network containing resistors and independent and dependent voltage and current sources
8. Find the Thevenin and Norton equivalents for an arbitrary network containing resistors and independent and dependent voltage and current sources
9. Use superposition to solve for the currents and voltages in a network with multiple independent sources
10. Determine the value of load resistance on a network for maximum transfer of power to the output.

Text Book:

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 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 25% 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 30% of the course grade.

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

**Outline**

**Week 1**
- Voltage, current, power, energy, Ohm's Law

**Week 2**
- Kirchhoff’s Voltage Law

**Week 3**
- Kirchhoff’s Current Law

**Week 4**
- Equivalent resistance; Y-Δ and Δ -Y networks
  - Exam-1

**Week 5**
- Use of voltage and current dividers in analysis

**Week 6**
- Dependent sources; mesh and node equations

**Week 7**
- Dependent sources; mesh and node equations

**Week 8**
- Thevenin and Norton equivalent networks

**Week 9**
- Exam-2
- Maximum power transfer; superposition

**Week 10**
- Review
- Final Project

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 EE 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 Judicial Affairs website [http://dsa.csupomona.edu/judicialaffairs/regulations.asp](http://dsa.csupomona.edu/judicialaffairs/regulations.asp)