The University of Maine

ECE214: Electrical Circuits Laboratory

Spring 2015

Credits: 2

Instructor:

Dr. Vincent Weaver
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Office: Barrows 203
Office Hours: 1pm - 2pm Monday - Thursday (or e-mail to arrange an appointment)

Course Website:

`http://www.eece.maine.edu/~vweaver/classes/ece214_2015s/`

Lectures: Tuesday 8:00am-8:50am, Barrows 125
Labs: Monday, Tuesday, Wednesday, Thursday 2:10pm-5:00pm
Texas Instruments (TI) Lab, Barrows 221

Course Listing:

Lab exercise and circuit simulations demonstrate concepts presented in ECE 210. Participants become familiar with circuit simulation, safety and grounding considerations, instrumentation, e.g., oscilloscopes, signal sources, multimeters, and signal analyzers. Also of particular significance will be the development of technical writing skills.

Requirements:

Pre-requisite: ECE210 Electric Circuits
Co-requisite: ECP214 Technical Writing Workshop for Electrical Networks I
(note: if you drop ECE214 you must also drop ECP214)

Textbook (optional reference):

"Electric Circuits 9th Edition," by James W. Nilsson and Susan A. Riedel, Prentice Hall, 2011. (Same text as used in ECE210).

Engineering Notebook

All students must have and properly maintain an "Engineering Notebook" to record calculations, simulation results, experimental data, graphs, and analysis pertaining to the laboratory experiments. A summary of each laboratory experiment should be included in the notebook.

Laboratory Periods

Attendance during the laboratory period is mandatory. There are a total of ten graded labs (Lab #1 – Lab #10). Most labs are divided into three parts:

1. "Pre-Lab" – circuit design calculations and simulations which can and should be completed before the laboratory period.

2. "Laboratory Procedure" – actual construction of circuits and measurements of circuit performance which should be completed during the laboratory period.

3. "Post-Lab" – analysis of measured results and comparison of simulations with measurement results which are to be completed after the laboratory period.

For maximum laboratory credit, demonstration of laboratory completion requires a sign-off on the "Pre-Lab" and "Laboratory Procedure" by one of the TAs on the day of the lab. Points will be deducted for late completions. Post-labs are graded when laboratory Notebooks are collected during Spring Break and at the end of the semester.

Laboratory Etiquette

The Texas Instruments (TI) lab is heavily used this semester. Please keep the lab neat, clean, and remove any trash from the tables before you leave. The last student to leave should turn off the lights and close both doors. Please do not rearrange the furniture, remove furniture, or bring in other furniture. Food and beverages are not allowed in the lab.

Laboratory Safety

Always be safe when working in the lab. Students may not work alone in the lab or with the doors closed. At least one other student, a TA, or a faculty member must be present at all times. When working in the lab make sure both doors are fully open and remain open at all times. Do not use or operate any test equipment unless you are familiar with the proper use and operation of the equipment.

Tentative Laboratory Schedule

Class	Date	Topic
Lab #0	13 January 2015	Lab Intro and Safety
Lab #1	20 January 2015	
Lab #2	27 January 2015	
Lab #3	3 February 2015	
Lab #4	10 February 2015	
Lab #5	17 February 2015	
Exam #1	24 February 2015	
Spring Break	3 March 2015	
Spring Break	10 March 2015	
Lab #6	17 March 2015	
Lab #7	24 March 2015	
Lab #8	31 March 2015	
Lab #9	7 April 2015	
Lab #10	14 April 2015	
Exam #2	21 April 2015	

Lab Partners

You will be expected to work in teams of two during the lab periods. Each student must keep a separate engineering notebook to record the lab results. You will have the opportunity to change laboratory partners at the mid-semester break.

Calculators

You are strongly encouraged to have a scientific calculator which is capable of solving simultaneous linear equations with complex variables. Calculators may be used when solving homework problems and taking exams. The most popular calculators are the TI-89, TI-89 Titanium, and the HP50g.

Lab Supplies

Each student will be provided with a BNC-to-alligator cable and a solderless breadboard. You have in theory already been issued a DVM (digital voltmeter). Labs will often require three cables and extra cables are stored in the lab.

Software

1. Circuit simulation: Micro-Cap 11 by Spectrum Software (`http://www.spectrum-soft.com`). Windows based circuit simulation software. Evaluation version, which allows simulations of circuits with less than 50 components, is free. Note: Micro-Cap can be run on a Mac and in Linux using "wine". For a tutorial on installing wine on a Mac, see: `http://www.davidbaumgold.com/tutorials/wine-mac/`

2. Data analysis: MATLAB®or Octave

   (a) MATLAB®by MathWorks (`http://www.mathworks.com/`). Available for Windows, Mac, and Linux. Cost: Student version $99. Also available on your laptop using a virtual machine and the UMaine Supercomputer instructions on course website.

   (b) Octave (`http://www.gnu.org/software/octave/`). Opensource version of MATLAB®. Available for Windows, Mac, and Linux OS. Cost: Free.

Exams

There are two Preliminary Exams and a Final Exam. The preliminary exams will take place during the Tuesday morning lecture sessions. Your Engineering Notebook and a hand held calculators (no laptops) may be used during the exam. The exam grade will be based on the correct method and the correct answer. Presentation of the results will not be separately graded, but poor presentation of your work will lower your grade – be neat! I will do my best to figure out what you meant to do on a problem, but if the work is poorly laid out or just a mess, your grade will suffer.

Exam Schedule:

Exam #1	Tuesday, 24 February 2015, 8am
Exam #2	Tuesday, 21 April 2015, 8am
Final Exam and Notebooks Due:	Tuesday, 5 May 2015, 8:00am-10:00am, Barrows 125

Grading:

Lab Sign-offs (Pre-lab and Procedure)	20%
Engineering Notebook (Post-Lab)	20%
Exam #1	15%
Exam #2	15%
Final Exam	20%
Final technical reports	10%
	100%

Letter Grade Assignments:

90-100	A
80-89	B
70-79	C
60-69	D
<60	F

Academic Honesty Statement:

Academic honesty is very important. It is dishonest to cheat on exams, to copy term papers, to submit papers written by another person, to fake experimental results, or to copy or reword parts of books or articles into your own papers without appropriately citing the source. Students committing or aiding in any of these violations may be given failing grades for an assignment or for an entire course, at the discretion of the instructor. In addition to any academic action taken by an instructor, these violations are also subject to action under the University of Maine Student Conduct Code. The maximum possible sanction under the student conduct code is dismissal from the University.

Students with disabilities statement:

If you have a disability for which you may be requesting an accommodation, please contact Ann Smith, Director of Disabilities Services, 121 East Annex, 581-2319, as early as possible in the term.

Course Schedule Disclaimer (Disruption Clause):

In the event of an extended disruption of normal classroom activities, the format for this course may be modified to enable its completion within its programmed time frame. In that event, you will be provided an addendum to the syllabus that will supersede this version.

Sexual Violence Policy:

Sexual Discrimination Reporting: The University of Maine is committed to making campus a safe place for students. Because of this commitment, if you tell a teacher about an experience of sexual assault, sexual harassment, stalking, relationship abuse (dating violence and domestic violence), sexual misconduct or any form of gender discrimination involving members of the campus, your teacher is required to report this information to the campus Office of Sexual Assault & Violence Prevention or the Office of Equal Opportunity.

If you want to talk in confidence to someone about an experience of sexual discrimination, please contact these resources:

For confidential resources on campus: Counseling Center: 207-581-1392 or Cutler Health Center: at 207-581-4000.

For confidential resources off campus: Rape Response Services: 1-800-310-0000 or Spruce Run: 1-800-863-9909.

Other resources: The resources listed below can offer support but may have to report the incident to others who can help:

For support services on campus: Office of Sexual Assault & Violence Prevention: 207-581-1406, Office of Community Standards: 207-581-1409, University of Maine Police: 207-581-4040 or 911. Or see the OSAVP website for a complete list of services at `http://www.umaine.edu/osavp/`