

# ECE 2100 Circuit Analysis

Syllabus for Summer I, 2010



Lecture: Rm. C-229 @10:30 am MWF

Lab: Rm. B-215

Instructor: Dr. Dean Johnson

Office: Rm. B-228 West Parkview

Email: johnson@wmich.edu

Hours: MWF 9:30 to 10:30 a.m.

## Course Objective

The purpose of this course is to study electric circuits composed of R, L and C elements using methods based on Kirchhoff's laws and network theorems. Also model RL, RC, and RLC filter circuits with 1<sup>st</sup> and 2<sup>nd</sup> order differential equations and perform transient and sinusoidal steady state analysis of such circuits.

## Materials Used in Class:

1. **Text:** C. K. Alexander and M. N. O. Sadiku, Fundamentals of Electric Circuits, 4<sup>th</sup> ed., McGraw-Hill, Boston, 2008 (ISBN 0-07-352955-9).
2. **On-line homework registration:** Go to <http://www.mharris.com> & press the *Student* button. On the following screen, enter **BD6-F8-7F6** in the Section Enrollment Code box. Type the email address and password to create an account. You may have to pay a \$15 fee.
3. **DyKnow:** Find the Sign On drop down menu and then New User link and select this course. Complete registration page. Save sessions at end of class and replay using <http://www.dyknow.com/download>
4. **Lab notebook** (permanent bound --spiral or hardbound), pages lined with square grid.
5. **Model MY-60 Digital Multimeter** (yellow), available from ECE office. Alternatively: **Sears Craftsman 82139 Multimeter** (or equivalent).
6. **Linear Technology, LTspice/SwitcherCAD<sup>TM</sup> III**, available at no cost at <http://www.linear.com/designtools/software/>. This software will be used to simulate circuits and is available in the CAE center and in the ECE 2100 laboratory.
7. **Safety goggles.** No admittance to the lab w/o goggles. See ECE office.

**Exams:** There will be three hourly exams, The 1<sup>st</sup> exam will be before Memorial day. The 2<sup>nd</sup> exam will be after Memorial day. A 3<sup>rd</sup> final exam will be held on the last day of class, June 30. The 3<sup>rd</sup> exam will be comprehensive over all course material. Students are *required* to attend all exams as announced; failure to do so will in a zero score for any examination not attended (if an emergency arises, you must email the instructor *before* any examination)

**Lab work:** 12 experiments. Most laboratory experiments require prelab work in the form of written calculations in your lab notebook or computer simulations. If you don't show up for a lab, you forfeit the points associated with the entire lab that week, and generally cannot later make up the lab. Exceptions will be made only for those individuals who contact their lab instructor *before* the lab, giving an adequate reason why they cannot attend that day. Contact your lab instructor at his/her office hours for help with lab calculations. Note: you must also achieve a passing grade in the lab in order to pass the entire course. Note: there will be occasional quizzes in the lab.

**Homework:** (See point 2 above). HW problems are submitted on-line and change each time they are viewed. May be done more than once to improve score, until due date. Start early to earn best scores.

**Grading:** Grades will be determined on the basis of the following guaranteed grade scale:

Exam I	20%	91 - 100	A
Exam II	20%	86 - 90	BA
Homework	10%	80 - 85	B
Lab Work	25%	74 - 79	CB
Final Exam	25%	68 - 73	C
	100%	63 - 67	DC
		58 - 62	D
		0 - 57	E

**WMU Honesty Policy:** Attempting to obtain credit for work (lab, hw, exams) done by somebody else is illegal and punishable in this class. You are responsible for making yourself aware of and understanding the policies and procedures in the Undergraduate (pp. 274-276) [Graduate (pp.25-27)] Catalog that pertain to Academic Honesty. These policies include cheating, fabrication, falsification and forgery, multiple submission, plagiarism, complicity and computer misuse.

## GENERAL COURSE OUTLINE, ECE 2100 SUMMER 2010 (Tentative: May be adjusted)

Week	Lecture/Lab Topic	Reading
<b>May</b>		
10 12 14 1011 1213	Circuit Concepts and Laws <a href="#">Safety &amp; Rules</a> & <a href="#">Notebooks</a> <a href="#">Ohm's Law</a>	Chapters 1,2
17 19 21 1718 1920	Circuit Analysis with R's <a href="#">Series and Parallel Circuits</a> <a href="#">Basic DC Meter Design</a>	Chapter 3
24 26 28 2425 2627	Circuit Theorems <a href="#">Nodal and Mesh Analysis</a> <a href="#">Superposition &amp; Thevenin's</a>	Chapter 4
2 4	Op-Amps	Chapter 5

<b>June</b>		
7 9 11 78 910	L and C's, 1 <sup>st</sup> Order Circuits <a href="#">Op-Amp Circuits</a> <a href="#">Waveforms &amp; Oscilloscopes</a>	Chapters 6,7
14 16 18 1415 1617	2 <sup>nd</sup> Order Circuits <a href="#">RC Circuit Step Response</a> <a href="#">RLC Circuit Step Response</a>	Chapter 8
21 23 25 2122 2324	Sinusoids, Phasors & Analysis <a href="#">Circuit Element AC Response</a> <a href="#">RC Filter Frequency Response</a>	Chapters 9,10
28 30 2829	AC Power <a href="#">AC Power and PFC</a>	Chapter 11