

ECE 376 ELECTRICAL AND ELECTRONIC CIRCUITS
Course Information & Syllabus for Fall Semester 2002

Instructors:

Lec. 9:55 TR	Prof. Paul Milenkovic 3623 Engineering Hall milenkovic@engr.wisc.edu Phone 262-3892	Office Hours: M 11 AM-3 PM at 133 Wendt Library T 11 AM-12:15 PM R 11 AM-12:15 PM 3623 Engr
Lab Mgmt	Mr. Rajas Sambhare	Office Hours: to be announced

Attendance is important!

Regular classroom attendance is essential; ability to attend the Timetable-posted class times is an important part of your ability to take this course. Owing to the breadth of topic covered, this course progresses rapidly over much material. Missing one day of class may result in missing an entire topic. Important handouts are given and announcements made in the class time.

ECE 376 Laboratory

The laboratory is an integral part of this course, and may reinforce or complement material covered in class. Many topics are introduced in the labs, whether or not they are also covered in lecture, and you may be asked about those topics in regular course exams.

Homework

Homework will typically be assigned in Tuesday class and be due at the start of class the following Tuesday. Check the Web page

<http://courses.engr.wisc.edu/ecow/get/ece/376/milenkovic/homework/>

to view solutions the day following when a homework is due. Late homework will not be accepted – check with your instructor regarding exceptional circumstances – illness or other matters.

Exams

There are 3 in-class exams of 50 minutes duration: Oct 10, Nov 7, and Dec 12.

Grading Policy

The grade for this course is based on:

3 exams	@20% ea.	60%
Laboratory		25%
Homework		<u>15%</u>
Total:		100%

Textbook

We are using a limited-scale version of a text that we have used previously. This is **Fundamentals of Electric Circuits by J. R. Cogdell**. Two topics not included in this text that will be included as part of this course are operational amplifiers and aspects of digital logic. The digital logic material is in **ECE 376 lecture notes on Digital Logic Circuits by Stremmer and Marleau** available at Bob's copy shop. The portion on operational amplifiers is being written by Marleau and will appear as a hand out. There is also a set of Lecture notes by Stremmer at Bob's that serve the circuit theory portion of the course. Good comments have been heard with regard to these notes. The lab instructors will inform you of the lab manual to be purchased at Bob's. You will be required to have the (1) lab manual and (2) digital logic notes from Bob's, and (3) the circuit notes are optional.

Notes and Lab Notes from Bob's Copy Shop

There are two packets of notes that are a "must purchase" at Bob's, the (1)376 lab note book, and (2)the 376 Logic Notes. There is also a third set of notes centered on circuit theory. Many students have found the circuit-theory notes quite helpful. ent in this regard.

Exam Policies

Exams in this course are 50 minute closed-book written exams. It is expected that you will have a calculator with you when you take the exams. **It will be especially valuable to be able to handle complex arithmetic on your calculator for the AC circuits portion (the mid portions) of this course.** You may take one 8-1/2" by 11" sheet of paper with you to Exam 1 on which you have written equations, etc., which you believe may be helpful to you in taking the exam. You are allowed 2 sheets in Exams 2 and 3.

Changes

If changes become advisable or necessary in course procedures or syllabus, we will give advance notice. In particular, we will try to be specific in the material to be covered in each exam no later than the review session for that exam (and earlier if possible).

<u>Wk</u>		<u>Date</u>	<u>Topic(s)</u>	<u>Reading</u>
1.	1	Sept 3	Voltage, current, resistor circuit, KCL, KVL, power-flow sign conventions	1.1 - 1.5
	2	Sept 5	Resistance and Ohm's law, series and parallel resistors, voltage and current dividers	1.6-1.7
2.	3	Sept 10	Thevenin model, determining Thevenin parameters	2.1 - 2.2
	4	Sept 12	Norton equivalent circuit; source transformations, superposition, node and mesh equations	2.1 - 2.2
3.	5	Sept 17	Maximum power transfer, node and mesh analysis	2.3-2.4
	6	Sept 19	Node analysis with voltage constraints; mesh analysis with current constraints	2.3-2.4
4.	7	Sept 24	Op amps, feedback, virtual reference voltage	Notes
	8	Sept 26	Op amps circuits, op amp saturation	Notes
5.	9	Oct 1	Capacitor and inductor equations, capacitors and inductors excited by sinusoids	3.1
	10	Oct 3	KVL on sinusoidal waveforms. Phasor representation, using phasors to add sinusoids.	4.1-4.2
6.		Oct 8	Exam review (response to student questions)	
		Oct 10	Exam 1 – in class, closed book, 1 sheet of notes, 50 minutes.	
7.	11	Oct 15	Impedance, admittance, and DC methods applied to AC circuits	4.3
	12	Oct 17	Phasor representation of AC circuits	4.4
8.	13	Oct 22	1 st order RC, and LR filters, op amp filters.	5.4
	14	Oct 24	Average real and reactive power in AC circuits	6.1
9.	15	Oct 29	Complex power in AC circuits	6.2
	16	Oct 31	Ideal transformers, maximum power transfer	6.3
10.		Nov 5	Exam review (response to student questions)	
		Nov 7	Exam 2 – in class, closed book, 2 sheet of notes, 50 minutes	

11.	17	Nov 12	Binary numbers	
	18	Nov 14	Basic combinational gates, combinational logic circuits	
12.	19	Nov 19	Karnaugh map minimization of combinations circuits	Notes
	20	Nov 21	S-R latch, clocked flip flops	Notes
13.	21	Nov 26	State-transition diagrams, informal sequential circuit analysis	Notes
		Nov 28	No class – Thanksgiving holiday	
14.	22	Dec 3	Formal sequential circuit analysis using characteristic equations	
	23	Dec 5	Sequential circuit design	Notes
15.		Dec 10	Exam review (response to student questions)	
		Dec 12	Exam 3 -- in class, closed book, 2 sheets of notes – covers digital logic only.	

Initial ECE 376 Lecture/Laboratory Schedule for Fall 2000

Week No.	Week	Class Lec			Lab Lec	Lab
		T	W	R		
1	Sept 2	Lec 1		Lec 2		
2	Sept 9	Lec 3		Lec 4	B&P Lab Lec 0*	
3	Sept 16	Lec 5		Lec 6		B Lab #0
4	Sept 23	Lec 7		Lec 8	B&P Lab Lec 1*	P Lab #0
5	Sept 30	Lec 9		Lec 10		B Lab #1
6	Oct 7	Review		Exam 1	B&P Lab Lec 2*	R Lab #1
7	Oct 14	Lec 11		Lec 12		B Lab #2
8	Oct 21	Lec 13		Lec 14	B&P Lab Lec 3*	R Lab #2
9	Oct 28	Lec 15		Lec 16		B Lab #3
10	Nov 4	Review		Exam 2	B&R Lab Lec 4*	B Lab #3
11	Nov 11	Lec 17		Lec 18		B Lab #4
12	Nov 18	Lec 19		Lec 20		R Lab #4
13	Nov 25	Lec 21		(no class)		
14	Dec 2	Lec 22		Lec 23		
15	Dec 9	Review		Exam 3		

The B and P letter codes refer to footnotes in the Timetable.
You will need to know the section number of the lab you are in.

The B labs (odd-week labs starting Sept 16 – week 3) are
302, 304, 306, 308, 310

The P labs (even-week labs starting Sept 23 – week 4) are
301, 305, 307, 309, 311, 313.

* Make sure that you attend what we here call the Lab Lecture -- called Discussion in the time table – prior to the corresponding lab date. **You will note that these discussions (lab Lectures) take place at 12 Noon Wednesday in 2535 Engr Hall and 12:05 PM Thursday 376 Mech Engr. Attend either the Wednesday or Thursday discussion – chose one that best fits your schedule. Be sure to attend at least one: they start 2nd week of class (week of September 9).**

Frequently Asked Questions (FAQ)

I cannot make one or more of the exam times. What do I do?

I have scheduled 3 exams during class time, which you are expected to be able to attend. Please indicate conflicts for religious observances or for other reasons by the first week of class if at all possible. Beyond the first week of class, exam excuses are at the discretion of the instructor.

Many of you will unavoidably take exams with the sniffles, but if you feel seriously ill or ill enough to affect your performance on the exam, please e-mail Milenkovic@engr.wisc.edu up to the day of the exam or even afterwards about alternate arrangements. We 1) want you to succeed 2) want you go get well, 3) are grateful if you keep serious communicable illnesses like the flu from spreading.

Do I need a calculator that does polar-rectangular conversions?

Yes.

My calculator won't do polar-rectangular. What do I do?

Purchase another calculator. A calculator to do this level of math is as much a requirement for this course as the textbook. The light-powered TI-36X is available from UW Bookstore for under \$30.

Can I use my super-programmable graphing calculator?

Ask your instructor if in doubt. But hey, your instructors are *electrical* engineers and we love circuit-based technology and we are pretty liberal about calculators.

It is the exam and I forgot my calculator. What do I do?

Bring your calculator to the exam. We may be able to supply you with a calculator in an emergency, but don't count on it.

Do I need to attend class?

Yes.

Do I need to hand in the homework?

Yes.

Can I hand the homework in late?

No.

I missed my lab section, how do I make it up?

Contact your lab T.A. and contact the lab T.A. of the section you would like to attend for makeup. I will have the Lab T.A.'s posted outside 3623 Engr. Hall.

I missed class, can I get the notes?

Class notes will be posted at least one day in advance of each lecture on the Web site.

I cannot find homework solutions on the Web page.

This one is probably my fault. A polite e-mail inquiry to Milenkovic@engr.wisc.edu will get results.

I got over 90 on 3 of the exams and I only did poorly on the 4th. Why did I get a C?

While the final grade is ultimately at the discretion of the instructor, we do average scores according to the weighting mentioned in this handout, and when homework and lab scores, which tend to have a high curve, are factored in, an unsatisfactory performance on one exam could result in a C grade. If there are circumstances of illness, personal problems, family or work responsibilities that you feel affect your performance, please discuss these matters with the instructor. It is critical that you have such discussions prior to the time that we announce that grades will be finalized. It is against University and Departmental policy to change grades based on student circumstances once grades are turned in.