

UNIVERSITY OF UTAH  
ELECTRICAL AND COMPUTER ENGINEERING DEPARTMENT

## ECE 3110: Electronics II

Fall 2005  
MWF 8:35-9:25 am  
BEH S 110

**Instructor:** Prof. Angela Rasmussen  
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**Prerequisites:** ECE 2100 and Department consent

**Text:** Sedra and Smith, *Microelectronic Circuits*, 5<sup>th</sup> Edition (Chapters 6-14)  
**Web Page:** <http://www.ece.utah.edu/~ee3110>

### General Description

This is the second part of engineering electronics designed for electrical engineering students and others needing an in-depth understanding of electronic circuit design and analysis. The primary emphasis of this class will be to cultivate an understanding of how modern electronic circuits work. Specific topics to be covered include differential and multistage amplifiers, amplifier frequency response and feedback, output stages, power amplifiers, a selection of analog integrated circuit topics, filters and tuned amplifiers, waveform-shaping circuits, and MOS digital circuits. This corresponds to Chapters 6-14 in Sedra and Smith.

A weekly laboratory is part of this course. It is assumed that each student has successfully completed the ECE 2100 course, and can use the SPICE circuit simulation program. Several lab and homework assignments in this class will require the use of PSpice, a version of SPICE that runs under Windows. The student edition of PSpice, which is limited to small circuits, has been installed on the PCs in the analog lab. You may also request your own free copy of the student edition from Cadence/Orcad by going to:

<http://www.orcad.com/downloads/orcadlite10/default.asp>

Aside from occasional simulation assignments, this course will emphasize manual analysis and design techniques so you can develop circuit analysis insight and intuition.

There is a course web page that will contain important information such as homework solutions, exam schedules, and device models for SPICE simulations. It is your responsibility to check the web page for course information.

### Reading

Books do more than hold homework problems! You are strongly encouraged to read *ahead* of the lectures. After each lecture, you should review the corresponding material in the textbook and then read the next section or two before the following lecture. This familiarization process will allow you to digest information from the lectures more easily. Reading assignments for each week will be posted on the class web site.

## Homework

To develop a good understanding of how circuits work, there is simply no substitute for *practice*. Therefore, homework problems will be assigned weekly. These problem sets will be collected and graded. Homework assignments turned in up to 24 hours late will be penalized 25% (i.e., multiply your score by 0.75). Assignments turned in more than 24 hours late will not be accepted. *If you turn in less than half of the assigned homework during the semester, you will automatically fail the class, regardless of your exam and lab grades.* Solutions will be posted in the glass cases by the department office on the Friday after problems are due.

Homework problems will be graded on a five-point scale (from 0-5), with credit being assigned as follows:

Answer	Method	Score
Right	Right	5
Wrong	right; arithmetic mistake	4
-	Close	3
-	Not close	1
-	no attempt	0

Your lowest homework grade will be dropped.

Unless otherwise specified, **homework assignments will be due on Wednesdays at 6:00 pm.** Put your assignments in the class homework locker on the 3<sup>rd</sup> floor of MEB.

## Spice

There will be 3 spice assignments. The dates for each are posted on the website. The first two assignments will be used in Lab's 1 and 2. **Spice 1 and 2 will not be accepted late!** If you do not hand them in before your lab section begins, you will not get any credit and will still need to do the assignment before you can complete the lab. The third spice assignment uses values obtained in your Lab 4. This third assignment will be accepted late. One letter grade (10% off grade) will be dropped per day late or per weekend that this third assignment is late. After 5 days, this third assignment will be given 25 points out of 100.

## Exams

There will be two midterm exams and one final exam. Exams may cover material from lectures, homework assignments, reading assignments, and lab assignments. Midterm dates are tentatively set for Oct. 5<sup>th</sup> and Nov. 23<sup>rd</sup>. The final exam will be comprehensive and will be given at the time specified by the University of Utah Fall Semester 2004 Final Exam Schedule: **Thursday, December 15, 8:00 - 10:00 am.** *No exceptions to the final exam schedule will be allowed.*

## Laboratory

There will be 5 lab assignments, with two to three weeks dedicated to each assignment. Each student must register for one of the laboratory sections, *and must attend that section* each week. Sections are limited to 20 students each due to space and equipment availability. Labs will meet in MEB 2365.

Labs will not meet during the following weeks:

- August 24 – August 26
- October 3 – October 7 (due to Fall Break)
- November 21 – November 25 (due to Thanksgiving)

A proper lab notebook is required. It must be a hard cover notebook such that pages cannot be added or replaced. All pages are to be prenumbered in keeping with standard practice. Entries are to be in ink, and made at the time the work is performed. As a general rule, the notebook is to contain enough detail that the experiment could be duplicated by others at some future time. Your lab T.A. may ask to look through your notebook at any time during the semester.

You will need to check off sections of the lab as they are completed. If the lab work is not completed in the lab section, you must hand in the other work in a very clear manner. You should have a cover page containing the title of the lab assignment and both lab partners' names. You may photocopy your lab book before the next lab section begins. The data is due *before* your next lab section meets. All data should be included that was not checked off in lab, with axes clearly labeled.

**Grading:** Your final grade will be determined based on the homework, weekly quizzes, spice assignments, midterms, and final exam. Your lowest weekly quiz grade and your lowest homework grade will be dropped. Your grade will be determined in two different ways:

1<sup>st</sup>:

Homework – 9% (lowest score dropped)  
 Spice – 9%  
 Labs – 17%  
 2 Midterms – 40%  
 Final – 25%

2<sup>nd</sup>:

Homework – 9% (lowest score dropped)  
 Spice – 9%  
 Labs – 17%  
 2 Midterms – 25%  
 Final – 40%

The best grade from the above two will be used as your final grade.

**Grades:** Your grade will be determined as follows:

A+	97 - 100
A	94 - 96
A-	90 - 94
B+	87 - 90

B	83 - 87
B-	80 - 83
C+	77 - 80

C	73 - 77
C-	70 - 73
D+	67 - 70

D	63 - 67
D-	60 - 63
F	<60

*Again, if you turn in less than half of the assigned homework during the semester, you will automatically fail the class, regardless of your exam and lab grades.*

### Cheating Policy

Cheating will not be tolerated, and will result in a failing grade in this course. Working in groups on homework assignments is allowed, but all work turned in should be your own. Dividing up a homework assignment between a group of students and then copying answers is considered cheating. Any data reported in lab reports should have been taken by you or your lab partner. Using someone else's data is considered cheating. The use of wireless devices is prohibited during exams.

**ECE 3110 – Fall 2005  
Tentative Class Schedule**

<i>Week</i>	<i>Date</i>	<i>Assignment Due</i>	<i>Lab</i>
1	Aug. 24		
	Aug. 26		
2	Aug. 29		Lab 1
	Aug. 31	Homework #1	
	Sept. 2		
3	Sept. 5	Labor Day	Lab 1
	Sept. 7	Homework #2	
	Sept. 9		
4	Sept. 12	Spice #1	Lab 2
		Homework #3	
	Sept. 14		
	Sept. 16		
5	Sept. 19		Lab 2
		Homework #4	
	Sept. 21		
	Sept. 23		
6	Sept. 26	Spice #2	Lab 3
	Sept. 28	Homework #5	
	Sept. 30		
7	Oct. 3		Lab 3 (lost week)
	Oct. 5	<b>Midterm #1 – Chapters 6 &amp; 7</b>	
	Oct. 7	Fall Break	
8	Oct. 10		Lab 3
	Oct. 12		
	Oct. 14	Homework #6	
9	Oct. 17		Lab 4
	Oct. 19	Homework #7	
	Oct. 21		
10	Oct. 24		Lab 4
	Oct. 26	Homework #8	
	Oct. 28		
11	Oct. 31		Lab 4
	Nov. 2	Homework #9	
	Nov. 4		
12	Nov. 7		Lab 5
	Nov. 9	Homework #10	
	Nov. 11	Spice #3	
13	Nov. 14		Lab 5
	Nov. 16	Homework #11	
	Nov. 18		
14	Nov. 21		Lab 5 (lost week)
	Nov. 23	<b>Midterm #2 – Ch. 8,14, 9</b>	
	Nov. 25	Thanksgiving	
15	Nov. 28		Lab 5
	Nov. 30		
	Dec. 2	Homework #12	
16	Dec. 5		
	Dec. 7	Homework #13	
<b>17</b>	<b>Thursday, Dec. 15</b>	<b>Final, 8-10am</b>	<b>Comprehensive</b>