

# ECE 2200

## Electrical Engineering for Civil Engineers Spring 2021 Class Syllabus

Instructor: Arn Stolp

Office: I don't expect to use my office or office phone: MEB 2262, (801) 581-4205

Phone: **(801) 657-7766** **Always** text first & start text with "ECE 2210". This is the best way to contact me. I may call back from (385) 429-3439 (a google voice number). Do not initiate contact on the 385 number.

E-mail: arnstolp@ece.utah.edu. I don't check my e-mail as often as I should, so text me if you send me email that I need to read.

Office hours: My "office hours" are the Zoom sessions and Monday problem sessions at class time 9:40 to 10:30 M, W, & F. Also, 11:50 to 12:50 W & F. Otherwise, text me. Start text with "ECE 2210" and your question.

DO NOT send messages via Canvas. I don't have the time to monitor them.

Web Site: <http://www.ece.utah.edu/~ece2210/index2200.html>

Required books and lab supplies:

Practical Electronics for Inventors, 3<sup>rd</sup> or 4<sup>th</sup> Ed, by Paul Scherz

Prerequisites:

MATH 2250 and PHYCS 2210, PHYCS 2220 is strongly recommended

### Introduction:

In case you haven't noticed, you're surrounded by electrical and electronic devices. Electrical motion, measurement and control are powerful and cheap, so they're used everywhere and are part of every technical career, including yours. Maybe you can find a job where other people make all the decisions concerning wiring, power distribution, electric motors, communications systems, instrumentation, and control; but do you *really want* that? Do you really *want* to be the clueless one?

ECE 2200 will introduce you to some of the basics of electrical engineering. This may not seem important now, but I think you will find these concepts very useful in your future classes and jobs. Besides, they'll help you pass the FE exam, and that should be of immediate concern.

I teach concepts and the use of those concepts to solve problems, not formulas and memorization. The hands-down easiest way get a good grade in this class is to learn those concepts.

### The Class:

I plan to teach most, if not all, of the class this semester as a "flipped" class.

**Lectures:** Watch video lectures before the Zoom session on the same subject.

Lectures set the direction and tone of the class and cover more than the written material. You will be held accountable for everything discussed in the lectures, so watching on schedule is important. I will link to them in Canvas "assignments". The lectures are also available at: [ece.utah.edu/~ece2210/ECE2210lect\\_S21.html](http://ece.utah.edu/~ece2210/ECE2210lect_S21.html) .

**Zoom Sessions:** W & F 9:40 -10:30 am and problem session, M 9:40 -10:30 am

Attendance is a required for at least the first 10 minutes of each session so that I can make class announcements. I may also cover new material and examples not in the regular video lectures. These are also problem and review sessions and your primary chance to ask questions and get help, it's highly likely that you will never see me in person this semester. Together, the video lectures and the Zoom sessions make a "flipped" class. I intend to record these sessions and publish them on Canvas.

**Textbook:**

The text contains a great deal of practical, useful information beyond the theoretical material we cover in this class. It should prove to be a good reference. The reading page numbers are for the 3<sup>rd</sup> edition (4<sup>th</sup> edition page may be a little different).

**Notes:**

I've supplemented the textbook with lots of notes and examples which you will download from Canvas or the class web site (<http://www.ece.utah.edu/~ece2210/>). You will probably want to print much of this material. The handouts are designed to be printed on both sides of the pages. Please conserve paper.

**Homework, homework, and more homework:**

100 pts.

I will assign many problems for you to turn in, most of which will come from hand-outs available on Canvas, expect homework at every lecture. Homework will be your main study tool. As such, I'll give you all the answers so that you can check your work immediately. In fact, you'll have to self-correct your homework. If you can't get the answer, check the web site for corrections, study some more, come to the problem session, or ask for help.

Your homework should be neat and clear and show all your work. For most problems the grader will simply check to see that you've done it and that your paper shows the enough work to get the answer. Only a few problems will be checked in greater detail. You may collaborate with others to learn how to do the homework, but will need to hand in your own work. Copying or allowing another student to copy your work is considered cheating.

You will probably learn more from doing the homework than any other part of this class. If you thoroughly understand the homework, you will know what the class is about, and the exams should give you no trouble.

Please scan your homework to a pdf file and turn it in to Canvas by the due date.

**Virtual Handouts:**

To make things a little easier for you, I will group class notes and homework assignments into weekly packets and link to them from Canvas "assignments". Lab assignments will be linked separately. All of the "handouts" for, homework, labs, notes, etc. are also available on the class web site; [ece.utah.edu/~ece2210/](http://ece.utah.edu/~ece2210/) .

**Midterm:**

100 pts.

One 50-minute midterm will cover material up to the time of the test. Exams are

normally closed book, closed notes, but will have to be a little different this semester. More information to come. My exams are designed to see if you learned concepts and problem solving strategies and whether you can work with them, sometimes in new and different ways. I want to find out how much you *know*, not how quickly you can find a similar example. Don't try to memorize specific problems. Exams also cover what you learn in the labs.

**Final:** Friday, 3/5/21 (ask 1<sup>st</sup> class day), or Wed., 3/10/21 (Recommended) 100 pts.

The 50 minute final will be comprehensive with greater emphasis on the most recent material. I highly recommend that you take the exam at the later date so that you will have enough time to study. If you want to take the your final class day, you will need to tell me at the first class. If you say nothing the first day then you will have to take the later exam (which is the best choice by far).

**Labs:** MEB 2275 70pts.

Due to the severity of covid-19 issues, all labs will be available on line at this time. They will be a combination of zoom videos and simulations. There will probably be an in-person option as well, pay attention to announcements on canvas.

**Grades:**

	<u>Pts</u>	<u>% of total</u>	<u>Grade</u>	
Homework:	50	> 93		A
Labs:	35	90-93	A-	
Midterm:	100	87-90	B+	
Final:	<u>100</u>	83-87	B	
Total:	285	80-83	B-	
		77-80	C+	
Cheating:	-285	73-77	C	
		70-73	C-	
		67-70	D+	
		63-67	D	
		60-63	D-	
		< 60		E

If you want any deviations from the normal requirements (say credit for labs, you've done before) you will need to see me before the work would normally be due and get an agreement *in writing*. You'll need to turn in your copy of the agreement with your final, so I'll remember to grade you properly.

# ECE 2200

A. Stolp

Tentative

01/17/21

## COURSE SCHEDULE

Week	Date	lect	Topics	Textbook (3rd ed.)
	<b>M 01/18</b>		<b>Martin Luther King Day</b>	
1	W 01/20	1	Introduction, Basic electrical units & symbols, Kirchhoff's laws, Switches	Ch1, 2.1-3, 2.17, 3.3
	F 01/22	2	Resistance, Ohm's law, Power, Resistors in parallel & series, Dividers	2.5-7, 2.11-12, 3.5
2	W 01/27	3	Sources, Nodes, Grounds, Branches, Meters, Superposition	2.10, 2.12-18
	F 01/29	4	Source models, Thevenin & Norton Eq. Circuits, Max power transfer	2.19
3	W 02/03	5	Finish Thevenin & Norton Examples, Networks, Nodal analysis	2.19, notes
	F 02/05	6	Battery types, Charging, Solar	3.2, 5.6, notes
4	W 02/10	7	Introduction to AC & Signals	2.20
	<b>F 02/12</b>		<b>Exam 1</b>	
5	<b>M 02/15</b>		<b>Presidents Day</b>	
	W 02/17	8	Capacitors, Inductors	
	F 02/19	9	Inductors, Resonance, RL first order transients	2.24, 3.7, 2.30
6	W 02/24	10	First order transients	2.34
	F 02/26	11	Steady-state Sinusoids, Phasors, & Complex numbers	2.25-26
7	W 03/03	12	Phasors, Impedance, & AC circuits	2.27
	F 03/05	13	AC circuit examples	2.29-30
8	<b>W 03/10</b>		<b>Exam 2</b>	
<b>ECE 2210 continues below. You may attend, but no more work will be required or accepted.</b>				
	F 03/12	14	Filters & Bode plots	
9	W 03/17	15	Second order transients, Laplace Impedance, Transfer functions	2.34, notes
	F 03/19	16	Second order transients, Time-domain solutions, Initial and final conditions	notes
10	W 03/24	17	Second order transient examples, Systems	notes
	F 03/26	18	Diodes basics, Diodes in DC circuits	4.2
11	W 03/31	19	Diodes in AC circuits, Rectification	4.2, notes
	<b>F 04/02</b>		<b>2210 Exam 3</b>	
12	W 04/07	20	Transistors, bjt	4.3, notes
	F 04/09	21	Transistors, Switching circuits, MOSFETS	Ch 8
13	W 04/14	22	Operational Amplifiers	
	F 04/16	23	DC motors, PWM	Ch 14, notes
14	W 04/21	24	RMS and AC Power	2.21-22
	F 04/23	25	AC Power, RMS, examples	2.28, 3.8
	W 04/28		Problem Session at normal class time	
16	<b>M 05/03</b>		<b>2210 Final Exam, 8:00am</b>	

# ECE 2200 Spring Semester, 2021

01/17/51

Week	Month	Mon	Tue	Wed	Thur	Fri
1	Jan	18 Martin Luther King Day	19 First Day of Classes	20 First class 2200	21	22 Last day to add or drop simply Hw1 Sat
2		25 Hw3	26	27	28	29 Hw3 Sat
3	Feb	1	2 Hw4	3	4	5 Hw5 Sat
4		8	9	10	11	12 Exam 1 Last day to withdraw 2200
5		15 Presidents Day	16	17	18	19 Exam 1
6		22	23	24	25	26
7	Mar	1	2	3	4	5
8		8	9 Exam Review	10 2210 Exam 2 2200 Final	11	12
9		15	16	17	18	19 Last day to withdraw from full semester classes
10		22	23	24	25	26
11		29	30	31	1	2 2210 Exam 3
12	April	5	6	7	8	9
13		12	13	14	15	16
14		19	20	21	22	23
15		26	27 Last Day of Classes	28 Reading Day ECE 2210 prob ses	29	30 ECE 2210 possible Final Review 4:00
16	May	3 ECE 2210 8:00	4	5	6 Freedom	7

# ECE 2200 Spring Semester, 2021

# MERRILL ENGINEERING BUILDING (BLDG. 064)

## SECOND FLOOR PLAN

