

# ECE 2200

## Electrical Engineering for Civil Engineers Spring 2022 Class Syllabus

Instructor: Arn Stolp

Office: MEB 2262

Phone: U of U: 581-4205

Only if it's important: Cell: (801) 657-7766 text 1<sup>st</sup>, start text with "ECE 2210"

E-mail: arnstolp@ece.utah.edu (I rarely check my e-mail, so let me know by some other method if you send me email that I need to read.) Subject should start with "ECE 2210". I don't look at any messaging on Canvas.

Office hours: My "office hours" are the problem sessions. Otherwise it's catch me if you can. I'm usually around until at least 2:00 p.m. M, W, & F. If I'm not in my office, check the lab. To increase your chances, talk to me in class to say when you'd like to see me. I teach another class right after this one M, W, F.

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

Downloaded class material packs (available on website) & Ring binder

Lab notebook (bound or spiral)

Breadboard & Lab parts available for purchase at lab (~\$16 on your U-card)

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.

### This class consists of:

**Lectures:** W & F 9:40 -10:30 am in WEB L104

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 your attendance is important.

### **Problem Sessions:** M 9:40am in WEB WEB L104

We cover a lot of material in this class and there is rarely enough lecture time to work examples or to answer your questions in detail. I will not cover new material in the problem session, so you can get by without coming, but I think you'll find it worth your while.

### **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).

### **Supplementary Packets (in place of class handouts):**

I've supplemented the textbook with weekly packs of class material which you will download from the class web site (<http://www.ece.utah.edu/~ece2210/index2200.html>). You should have received a class email with links. The packets are separated into class notes, homework assignments, and lab instructions. The packets available now will cover the first half of the class, additional packets will be available in March. Much of this material is also available individually on the web site. You will probably want to print much of this material. You can sign on to computers in the lab with the same user name and password you use (or can get) in the Engman computer lab (the one in WEB, floor L2). Then you can use the printers in the lab. The packets are designed to be printed on both sides of the pages. Please conserve paper and weight in your backpack.

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

14%.

Expect a homework assignment for each lecture (in weekly packets), to be turned in twice-a-week, often on non-class days. 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, ask for help, or see the posted solutions in my office window. Sometimes I even post solutions *before* the homework is due. So, you might ask, "Why is it handed in and 'graded'?" Well, to answer a question with a question, "Would you even do it otherwise?"

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.

You will need to scan your homework, create a .pdf file, and turn that in on canvas by 11:59 pm of the due date. Solutions will be posted in my office window. Most graded material will be returned on Canvas. Papers will be returned to a file cabinet in MEB 2101 according to a folder number you will receive later. Once you get your number, please remember it for use on exams. Paper material will be in an unlocked drawer and will **not be secure**. If you want your material returned to a locked location, simply remove your file and slip it under my office door.

**Midterm:**

(100 exam pts) 35%

One 50-minute midterm will cover material up to the time of the test. 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. Don't try to memorize formulas or specific problems. Exams also cover what you learn in the labs. All exams are closed book, closed notes, no phones, tablets or computers allowed. The class may be split into two or more rooms on exam days, listen in class for details. If you do poorly on an exam, come see me before the next exam, there may be an opportunity to improve your score.

**Final:** In your last lab (ask 1<sup>st</sup> class day), or Fri., 9:40am 4/4/22 (Recommended) 35%

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 in your last lab, you will need to tell me at the first class so that you can start labs the first week. If you say nothing the first day then you will have to take the later exam (by far the best choice).

**Labs:** MEB 2267

16%

Lab will be held every week, beginning the first week and including the last week of class. Many of the subjects covered in lab aren't covered anywhere else in class, so make sure you pay attention and read the lab instructions. You will have to keep a laboratory notebook as a requirement of the lab. Your lab TA will collect and grade these notebooks. Labs are **not optional**. For each lab that you miss or fail (< 60% score), your final grade will suffer a **half letter drop** (5% of possible points). Be sure to make-up any labs you miss or fail.

**Grades:**

		<u>% of total</u>	<u>Grade</u>
Homework:	14%	> 93	A
Labs:	16%	90-93	A-
Exams:	<u>70%</u>	87-90	B+
Total:	100%	83-87	B
		80-83	B-
Failed lab:	-5%	77-80	C+
		73-77	C
Cheating:	-100%	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.

**Covid Considerations:**

You will be expected to abide by university, state, and local mandates and requirements concerning masks, vaccinations, etc.. Failure to do so may affect you your grade in this class. All or part of this class may go online only at any time. If the labs become online or video labs, the lab percentage of the final grade will be reduced, possibly to as little as 8%. In that case, some additional material may be added to the lectures and homework.

# ECE 2200

A. Stolp

Tentative

01/09/22

## COURSE SCHEDULE

Week	Date	lect	Topics	Textbook (3rd ed.)
1	W 01/12	1	Introduction, Basic electrical units & symbols, Kirchoff's laws	Ch1, 2.1-3, 2.17
	F 01/14	2	Resistance, Ohm's law, Power, Resistors in parallel & series	2.5-7, 2.11-12, 3.5
2	M 01/17	Martin Luther King Day		
	W 01/19	3	Voltage and current dividers, Sources, Nodes, Grounds, Branches, Meter:	2.10, 2.12-16
	F 01/21	4	Superposition, Practical voltage and current sources	2.18, 3.2
3	W 01/26	5	Thevenin & Norton Equivalent Circuits, Max power transfer	2.19
	F 01/28	6	Thevenin & Norton Equivalent Circuits	notes
4	W 02/02	7	Networks, Nodal analysis	2.17, notes
	F 02/04	Exam 1		
	W 02/09	8	Introduction to AC & Signals, Capacitors	
	F 02/11	9	Capacitors, Inductors	2.23, 3.6, 2.24
6	W 02/16	10	Inductors, Resonance, RC first order transients	2.24, 3.7, 2.30
	F 02/18	11	First order transients, Recall complex numbers	2.34
7	M 02/21	Presidents Day		
	W 02/23	12	Complex numbers, Steady-state Sinusoids, Phasors, & Impedance	2.25-26
	F 02/25	13	Phasors, Impedance, & AC circuits	2.27
8	W 03/02	14	AC circuit examples	2.29-30
<b>ECE 2210 continues below exam 2. You may attend, but no more work will be required or accepted.</b>				
	F 03/04	14	AC circuit examples	
	lab time	15	Video Lecture: Filters & Bode plots	2.31-33, notes
	F 03/04	Exam 2, ECE 2200 Final		
	M 03/07	Spring Break		
	F 03/11			
9	W 03/16	15	Filters & Bode plots	2.31-33, notes
	F 03/18	17	Second order transients, Time-domain solutions	notes
10	W 03/23	18	Second order transients, Initial and final conditons	notes
	F 03/25	19	Second order transient examples, Systems	notes
11	W 03/30	20	Diodes basics, Diodes in DC circuits	4.2
	F 04/01	21	Diodes in AC circuits, Rectification	4.2, notes
12	W 04/06	22	Transistors	4.3
	lab time	23	Video Lecture: Transistors & Switching circuits	4.3, notes
	F 04/08	Exam 3		
13	W 04/13	24	Operational Amplifiers	
	F 04/15	25	Operational Amplifiers	Ch 8
14	W 04/20	26	RMS and AC Power	2.21-22
	H 04/21	ME Design Day in Union ballroom, Attendance is required for HW DD		
	F 04/22	27	AC Power, examples	2.28, 3.8
16	M 05/02	Review, 1:00pm on zoom		
	T 05/03	Final Exam, 8:00am		

# ECE 2200 Spring Semester, 2022

01/09/22

Week	Month	Mon	Tue	Wed	Thur	Fri
1	Jan	10 First Day of Spring Classes	11	12 First class 2200	13	14 Last day to add or drop 2200
2		17 Martin Luther King Day	18	19	20	21 Last day to elect CR/NC
3		24	25	26	27	28
4	Feb	31	1	2	3	4 Last day to withdraw 2200
5		7	8	9	10	11 Exam 1
6		14	15	16	17	18
7		21 Presidents Day	22	23	24 Poss Final in Lab if labs were started 1/13	25 Last lect., Poss Final in Lab if labs were started 1/14
8	Mar	28	1 Last 2200	2	3 Exam Review __:00 on zoom	4 Exam 2 Last day to withdraw 2210
		7 Spring Break, find some sun	8	9	10	11
9		14	15	16	17	18
10		21	22	23	24	25
11		28	29	30	31	1
12	April	4	5	6	7 2210 Exam Review __:00 on zoom	8 2210 Exam 3
13		11	12	13	14	15
14		18	19	20	21 ME Design Day? in Union bldg	22
15		25	26 Last Day of Classes	27 Reading Day ECE 2210 prob ses	28 Finals begin	29
16	May	2 Final Review 1:00 zoom	3 Final ECE 2210 8:00am	4	5 Freedom	6

# ECE 2200 Spring Semester, 2022

# ECE 2200 Spring, 2022 Homeworks & Labs

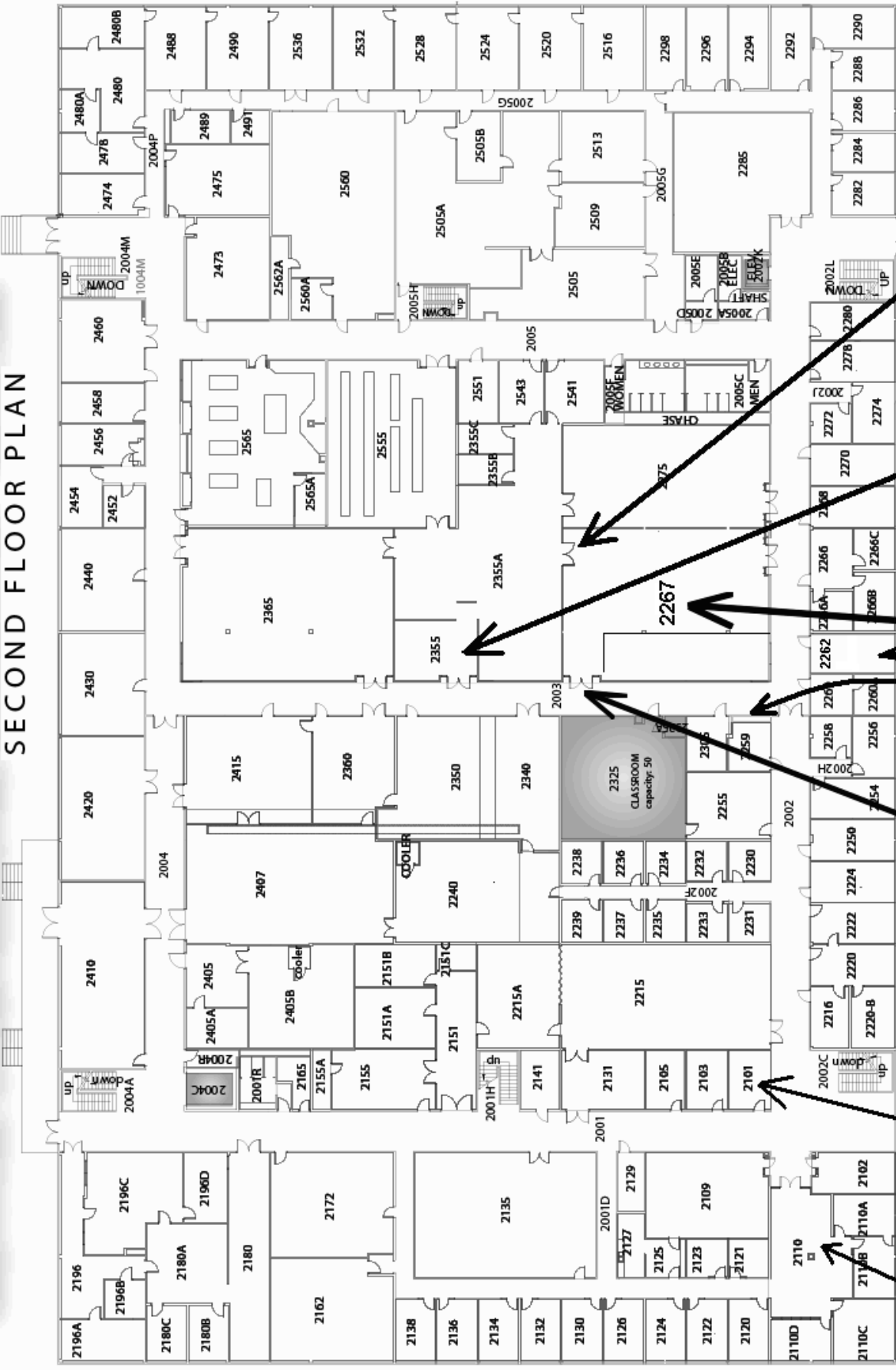
01/09/22

Week	Month	Mon	Tue	Wed	Thur	Fri
1	Jan	10	11	12	13	14
2		17 Martin Luther King Day	18 HW 1	19	20 Lab 1	21 HW 2 Lab 1
3		24	25 HW 3	26	27 Lab 2	28 HW 4 Lab 2
4	Feb	31	1 HW 5	2	3 Lab 3	4 HW 6 Lab 2
5		7	8 HW 7	9	10 Lab 4	11 Exam 1 Lab 4
6		14 HW 8	15	16	17 Lab 5	18 HW 9 Lab 5
7		21 Presidents Day	22 HW 10	23	24 Lab 6	25 HW 11 Lab 6
8	Mar	28 HW 12	1 2200 HW 13	2	3 Exam Review 1:00 on zoom. .	4 HW13 OK Exam 2
		7 Spring Break	8	9	10	11
9		14	15	16	17	18
10		21	22	23	24	25
11		28	29	30	31	1
12	April	4	5	6	7	8 2210 Exam 3
13		11	12	13	14	15
14		18	19	20	21 ME Design Day? in Union bldg	22
15		25	26	27 Reading Day ECE 2210 prob ses	28 Finals begin	29
16	May	2 Final Review 1:00 zoom	3 Final ECE 2210 8:00am	4	5 Freedom	6

# ECE 2200 Spring, 2022 Homeworks & Labs

# MERRILL ENGINEERING BUILDING (BLDG. 064)

## SECOND FLOOR PLAN



- ECE office**  
Homework, labs and exams are returned to a file cabinet in MEB (paper returns only) 2101
- Door with card access**  
Lockers for homework and lab notebooks (if not handed in on canvas) 2101
- Lab**  
Stockroom to buy parts
- Checkout Window**  
Arn's Office (MEB 2262) (Homework solutions will be posted here)