

ECE 2210

Electrical Engineering for Nonmajors Fall 2020 Class Syllabus

Instructor: Arn Stolp

Office: MEB 2262

Phone: U of U: 581-4205

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

E-mail: arnstolp@ece.utah.edu Subject should start with "ECE 2210"

Office hours: My "office hours" are the Zoom sessions at class time. Otherwise, text me. Start text with "ECE 2210"

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

Required books and lab supplies:

Practical Electronics for Inventors, 3rd or 4th Ed, by Paul Scherz

Ring binder & class material packs downloaded from website or Canvas

Lab notebook (bound or spiral) (Might not be required this semester)

Breadboard & Lab parts available for purchase at lab (~\$20 on your U-card) (Might not be required this semester)

Prerequisites: MATH 2250 and PHYCS 2220

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 2210 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.

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. At this time lectures are at:

ece.utah.edu/~ece2210/ECE2210lect_F20.htm, they also linked in Canvas.

Zoom Sessions: T & H 9:10 -10:30 am

Attendance is a required part of this class. I may 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.

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 3rd edition (4th 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 and weight in your backpack.

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.

Midterms:

300 pts.

You will take three 50-minute midterms throughout the semester. I plan to use ProctorU, so make sure you are set up to use that. 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 are normally closed book, closed notes, no phones, tablets or computers allowed, but will have to be a little different this semester.

Final: Tuesday, 12/8/20, 8:00 - 10:00 am 180 pts.
 The final will be comprehensive with greater emphasis on the most recent material.
 There will be a Zoom review Monday 12/7 at 1:00 pm. Watch your email for details.

Labs: MEB 2275? No in-person labs at this time ?? pts.
 Due to the severity of the coronavirus issues, there will be no in-person labs at this time. We may start some video labs, simulations or even in-person labs at any time, pay attention to your class emails.

Grades:

| | <u>Pts</u> | <u>% of total</u> | <u>Grade</u> |
|-----------|------------|-------------------|--------------|
| Homework: | 100 | > 93 | A |
| Labs: | ??? | 90-93 | A- |
| Quizzes | ??? | 87-90 | B+ |
| Midterms: | 300 | 83-87 | B |
| Final: | <u>180</u> | 80-83 | B- |
| Total: | ??? | 77-80 | C+ |
| | | 73-77 | C |
| Cheating: | -all | 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 work 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.

COLLEGE OF ENGINEERING GUIDELINES

Fall Semester 2020

Americans with Disabilities Act (ADA)

The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you need accommodations in a class, reasonable prior notice needs to be given to the instructor and to the Center for Disability Services, 162 Olpin Union, 581-5020 (V/TDD) to make arrangements for accommodations. All written information in a course can be made available in alternative format with prior notification to the Center for Disability Services.

Adding Classes

Please read carefully: All classes must be added within two weeks of the beginning of the semester (deadline: Friday, September 4, August 28 for 2200). Late adds will be allowed Sept 5 - Sept 14, requiring only the instructor's signature. Any request to add a class after September 14, will require signatures from the instructor, department, and Dean, and need to be accompanied by a petition letter to the Dean's office.

A \$50 FEE WILL BE ASSESSED BY THE REGISTRAR'S OFFICE FOR ADDING CLASSES AFTER September 14.

Withdrawal Procedures

See the web page for details: <http://registrar.utah.edu/academic-calendars/>

See the Class Schedule or web for more details. Please note the difference between the terms "drop" and "withdraw". Drop implies that the student will not be held financially responsible and a "W" will not be listed on the transcript. Withdraw means that a "W" will appear on the student's transcript and tuition will be charged.

Drop Period – No Penalty

Students may DROP any class without penalty or permission until Friday, September 4, 2020 (Friday, August 28 for 2200).

Withdrawal from Full Term Length Classes

Students may WITHDRAW from classes without professor's permission until Friday, October 16, 2020.

Between September 5 and October 16, a "W" will appear on the transcript AND tuition will be charged. Refer to Class Schedule, Tuition and Fees for tuition information.

Withdrawals after October 16 will only be granted due to compelling, nonacademic emergencies. A petition and supporting documentation must be submitted to the Dean's Office, 1602 Warnock Engineering Building. Petitions must be received before the last day of classes (December 3, 2020).

Withdrawal from Session I & Session II

See the web page for details: <http://registrar.utah.edu/academic-calendars/fall2020.php>

Repeating Courses

When a College of Engineering class is taken more than once, only the grade for the second attempt is counted. Grades of W, I, or V on the student's record count as having taken the class. Some departments enforce these guidelines for other courses as well (e.g., math, physics, biology, chemistry). Attempts of courses taken at transfer institutions count as one attempt. This means a student may take the course only one time at the University of Utah. Courses taken at the University of Utah may not be taken a second time at another institution. If a second attempt is needed, it must be at the University of Utah. Please work with your department advisor to determine the value of repeating courses. Students should note that anyone who takes a required class twice and does not have a satisfactory grade the second time may not be able to graduate. It is the responsibility of the student to work with the department of their major to determine how this policy applies in extenuating circumstances.

Appeals Procedures

See the Code of Student Rights and Responsibilities, located in the Class Schedule or on the UofU Web site for more details

Appeals of Grades and other Academic Actions

If a student believes that an academic action is arbitrary or capricious he/she should discuss the action with the involved faculty member and attempt to resolve. If unable to resolve, the student may appeal the action in accordance with the following procedure:

1. Appeal to Department Chair (in writing) within 40 business days; chair must notify student of a decision within 15 days. If faculty member or student disagrees with decision, then,
2. Appeal to Academic Appeals Committee (see <http://www.coe.utah.edu/current-undergrad/appeal.php> for members of committee). See II Section D, Code of Student Rights and Responsibilities for details on Academic Appeals Committee hearings.

ECE 2210

A. Stolp

Tentative

08/08/20

COURSE SCHEDULE

| Week | Date | lect | Topics | Textbook |
|------|----------|--------------|--|-----------------------|
| 1 | T 08/25 | 1 | Introduction, Basic electrical units & symbols, Kirchhoff's laws, Switches | Ch1, 2.1-3, 2.17, 3.3 |
| | Th 08/27 | 2 | Resistance, Ohm's law, Power, Resistors in parallel & series, Dividers | 2.5-7, 2.11-12, 3.5 |
| 2 | T 09/01 | 3 | Voltage and current dividers, Sources, Nodes, Grounds, Branches, Meters | 2.10, 2.12-16 |
| | Th 09/03 | 4 | Superposition, Practical voltage and current sources, Batteries, Solar | 2.18, 3.2, 5.6, notes |
| 3 | M 09/07 | Labor Day | | |
| | T 09/08 | 5 | Thevenin & Norton Equivalent Circuits, Max power transfer | 2.19, notes |
| | Th 09/10 | 6 | Networks, Nodal analysis | 2.17, notes |
| 4 | T 09/15 | 7 | Introduction to AC & Signals | 2.29 |
| | Th 09/17 | 8 | Capacitors, RC first order transients | 2.23, 3.6 |
| 5 | T 09/22 | Exam 1 | | |
| | Th 09/24 | 9 | Inductors, Resonance, RL first order transients | 2.24, 2.30, 3.7 |
| 6 | T 09/29 | 10 | First order transients | 2.34 |
| | Th 10/01 | 11 | Steady-state Sinusoids, Phasors, & Complex numbers | 2.25-26 |
| 7 | T 10/06 | 12 | Phasors, Impedance, & AC circuits | 2.27 |
| | Th 10/08 | 13 | AC circuit examples | 2.29-30 |
| 8 | T 10/13 | Exam 2 | | |
| | Th 10/15 | 14 | Filters & Bode plots | 2.31-33, notes |
| | lab lect | 15 | Second order transients, Laplace Impedance, Transfer functions | 2.34, notes |
| 9 | T 10/20 | 16 | Second order transients, Time-domain solutions | notes |
| | Th 10/22 | 17 | Second order transients, Initial and final conditions | notes |
| 10 | T 10/27 | 18 | Second order transient examples, Systems | notes |
| | Th 10/29 | 19 | Diodes basics, Diodes in DC circuits | 4.2 |
| 11 | T 11/03 | 20 | Diodes in AC circuits, Rectification | 4.2, notes |
| | Th 11/05 | 21 | Transistors, bjt | 4.3 |
| 12 | T 11/10 | Exam 3 | | |
| | Th 11/12 | 22 | Transistors, Switching circuits, MOSFETS | 4.3, notes |
| | lab lect | 23 | Operational Amplifiers | Ch 8 |
| 13 | T 11/17 | 24 | Operational Amplifiers | Ch 8 |
| | Th 11/19 | 25 | DC motors, PWM | Ch 14, notes |
| 14 | T 11/24 | 26 | RMS and AC Power | 2.21-22 |
| | Th 11/26 | Thanksgiving | | |
| 15 | T 12/01 | 27 | AC Power, Transformers | 2.28, 3.8 |
| | Th 12/03 | 28 | AC Power, 3 phase, Y, Delta, examples | Appendix A |
| | F 12/04 | | Review, 3:05 pm | |
| 16 | M 12/07 | | Review, 1:00 pm | |
| | T 12/08 | | Final Exam, 8:00 - 10:00 am | |

ECE 2210 Fall Semester, 2020

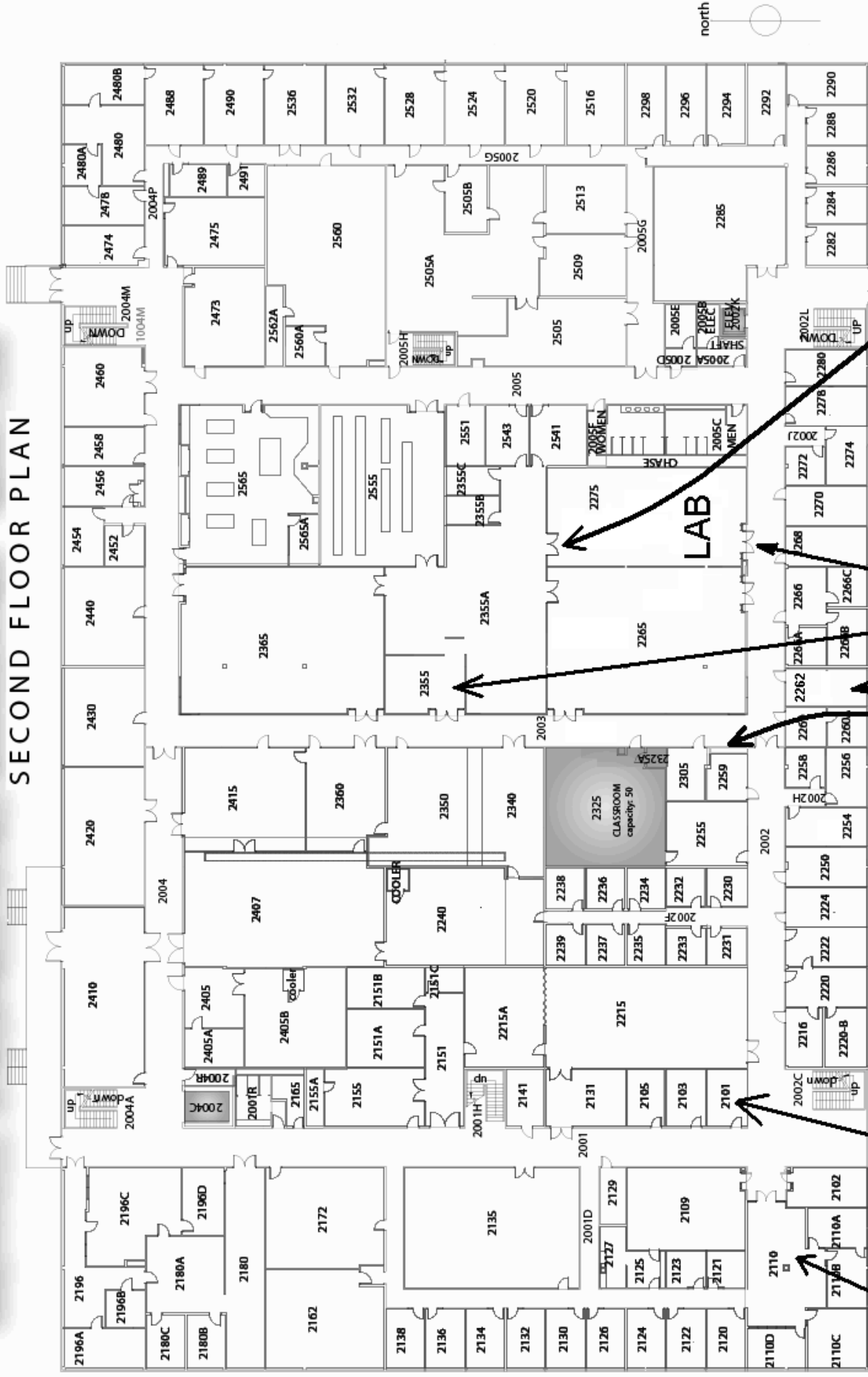
A. Stolp 8/18/20

| Month | Week | Mon | Tue | Wed | Thur | Fri |
|-------|------|------------------------|---------------------------------------|-----|-----------------------|--------------------------------|
| Aug | 1 | 24 | 25 First Class | 26 | 27 | 28 |
| | 2 | 31 | 1 | 2 | 3 | 4 Last day to add or drop 2210 |
| Sept | 3 | 7 Labor Day | 8 | 9 | 10 | 11 |
| | 4 | 14 | 15 | 16 | 17 | 18 |
| | 5 | 21 | 22 Exam 1 | 23 | 24 | 25 |
| | 6 | 28 | 29 | 30 | 1 | 2 |
| Oct | 7 | 5 | 6 | 7 | 8 | 9 |
| | 8 | 12 | 13 Exam 2 | 14 | 15 | 16 Last day to withdraw |
| | 9 | 19 | 20 | 21 | 22 | 23 |
| Nov | 10 | 26 | 27 | 28 | 29 | 30 |
| | 11 | 2 | 3 | 4 | 5 | 6 |
| | 12 | 9 | 10 Exam 3 | 11 | 12 | 13 |
| | 13 | 16 | 17 | 18 | 19 | 20 |
| | 14 | 23 | 24 | 25 | 26 Thanksgiving | 27 |
| Dec | 15 | 30 | 1 ME Design Day in Union bldg (maybe) | 2 | 3 Last Day of Classes | 4 Reading Day |
| | 16 | 7 ECE 2210 review 1:00 | 8 ECE 2210 Final 8:00 - 10:00 | 9 | 10 | 11 |

ECE 2210 Fall Semester, 2020

MERRILL ENGINEERING BUILDING (BLDG. 064)

SECOND FLOOR PLAN



ECE office

Homework, labs and exams are returned to a file cabinet in MEB 2101

Lockers for homework and lab notebooks

Door with card access Stockroom to buy parts

Checkout Window

Ann's Office (MEB 2262) (Homework solutions will be posted here)