

**EEE3308C Electronic Circuits
Syllabus Fall 2020**

			Lecture	Topic	Text	Lab
Aug	M	31	1	Intro; LTSpice	Ch. 1	
Sept	W	2	2	Amplifiers intro, design-oriented analysis	Ch. 1	
Sept	F	4	3	Voltage/current dividers, cascade amps	Ch. 2	
Sept	M			Labor Day no class	Ch. 2	
Sept	W	9	4	Op amps	Ch. 2	1 Tu
Sept	F	11	5	Op amp applications	Ch. 2	1 Th
Sept	M	14	6	Op amp non-idealities	Ch. 2	1 M
Sept	W	16	7	Difference/instrumentation amps	Ch. 2	2 Tu
Sept	F	18	8	AC coupling	Ch. 2	2 Th
Sept	M	21	9	Choosing capacitors, port resistances	Ch. 2	2 M
Sept	W	23	10	Review for Test 1	Ch. 2	
Sept	F	25		Test 1		
Sept	M	28	11	NMOS FET regions of operation	Ch. 5	3 M
Sept	W	30	12	MOSFET amplifier	Ch. 5	3 Th
Oct	F	2		Homecoming no class		
Oct	M	5	13	Coupling, bypass cap design, more small-sig	Ch. 7	4 M
Oct	W	7	14	Degeneration, source follower	Ch. 7	4 Th
Oct	F	9	15	Other FET types, PMOS	Ch. 7	
Oct	M	12	16	Multi-stage amplifier design example	Ch. 7	5 M
Oct	W	14	17	BJT	Ch. 6	5 Th
Oct	F	16	18	BJT	Ch. 6	
Oct	M	19	19	BJT	Ch. 6	
Oct	W	21	20	Multi-stage amps	Ch. 8	
Oct	F	23		Test 2		
Oct	M	26	21	PMOS regions of operation	Ch. 8	
Oct	W	28	22	NMOS/PMOS amps	Ch. 8	
Oct	F	30	23	Multi-stage amplifier design example	Ch. 8	
Nov	M	2	24	Current mirror; active load	Ch. 8	6 M
Nov	W	4	25	Diff pair	Ch. 14	6 Tu
Nov	F	6	26	Diff pair	Ch. 14	6 Th
Nov	M	9	27	Logic: Inverters	Ch. 14	7 M
Nov	W	11		Veterans Day no class		
Nov	F	13	28	Logic: Inverters	Ch. 14	7 Th
Nov	M	16	29	Logic: NAND, NOR, delay	Ch. 14	
Nov	W	18	30	Logic: Transmission gate	Ch. 14	7 W
Nov	F	20		Test 3		
Nov	M	23	31	Comparators, Schmitt trigger	Ch. 18	
				Thanksgiving no class		
Nov	M	30	32	Relaxation oscillator, 555	Ch. 18	
Dec	W	2	33	Diodes	Ch. 4	8 W
Dec	F	4	34	Wave-shaping circuits	Ch. 4	8 M
Dec	M	7	35	HF response	Ch. 10	8 Tu
Dec	W	9	36	Op amp HF response	Ch. 10	
Dec	F	18		Final Exam		

- Lab 1: Intro: Thevenin, Norton, etc.
- Lab 2: Non-Ideal Op Amps
- Lab 3: MOSFET Common-Source Amp
- Lab 4: Tone Control
- Lab 5: Spice Workshop 1
- Lab 6: Current Mirrors
- Lab 7: CMOS Logic
- Lab 8: Relaxation Oscillators

EEE3308C Electronic Circuits

Fall 2020

Description: Fundamentals of electronic circuits and systems. Lab.

Prerequisites: EEL 3008 Physics of EE

Class times: MWF 7th period (1:55 – 2: 45PM) **ONLINE/ZOOM**

Professor: Robert Fox (fox@ece.ufl.edu)

UPIs:

Andres Inchausti (AndresInchausti@ufl.edu)

Tony Rawda (trawda@ufl.edu)

Lucas Bell (twentyorb@ufl.edu)

Course Organization: Each major topic will include homework assignments and labs emphasizing practical applications. There will be three in-class tests, plus a final exam.

Textbook: A. Sedra and K. Smith, *Microelectronic Circuits*, 7th Ed. (Note: 6th Edition may be usable but 7th is preferred.)

Digilent Analog Discovery Board: Required. Versions 1 or 2 are OK. Works with PC or Mac.

Parts Kit: You will need to order your own parts for lab. See the Canvas page.

Grading:

HW:	15% (drop lowest one)
Labs, projects:	15%
Tests (3@16% each):	54%
Final Exam	22%

Course Themes:

- Practical electronics: How do you create circuits to do useful things?
- Basic electronic elements: Op amps, FETs, BJTs, diodes
- Design-oriented analysis

Lab Sections:

ONLINE/ZOOM

12399	Monday	9 – 10	(4:05 –6:00)	UPI: Lucas
12400	Monday	E2 – E3	(8:20 – 10:10)	UPI: Tony
12401	Tuesday	9 – 10	(4:05 –6:00)	UPI: Andres
12402	Wednesday	11 – E1	(6:15 – 8:10)	UPI: Tony
12403	Thursday	11 – E1	(6:15 – 8:10)	UPI: Andres

UPI Office Hours: TBD

Homework: ~ 1 per week

- Usually due by the start of 2nd following class, where solutions will be discussed
- Goals are to illustrate and reinforce lecture topics and to provide practice for quizzes
- Lowest score will be dropped
- It's OK to work in groups or to get tips from other students, you must push your own calculator buttons and the work you turn in must be your own.
- You won't learn as much from the homework if you depend on somebody else to tell you how to do it.
- Homework is usually assigned at the end of a lecture, often on a Monday and is usually due at the start of the class meeting after the next one, usually a Friday.
- I go over the homework solutions at the start of class, while it's fresh in your mind.
- Turn in homework electronically in Canvas as .pdf, .doc, .xls, or .asc.
- Late homework may be accepted at the instructor's discretion, typically for reduced credit.
- Turning in homework late based on my published solutions would be cheating.

Class Meetings:

Class Participation: The lectures and the labs are online and synchronous through Zoom. The lectures will be recorded and posted to MediaSite where you can watch whenever you want. It's best to watch the lectures in real-time so you can ask questions and participate in chats.

Handouts: I put as much as possible in the notes, but the lectures usually cover more.

Textbook: We will follow the book closely. Anything in an assigned chapter of the book is fair game unless I specifically tell you otherwise.

Problems: Work as many as you can find. This is the best possible test preparation.

Supplementary problems: Sometimes we can help find more practice problems. Assign yourself design problems. Look at other books. Search online.

SPICE Assignments:

- LTSpice. Download from <http://www.linear.com/designtools/software/>
- To help debugging SPICE runs, we'll need print-outs of input and output files, a schematic with labeled node numbers, .OP (Bias Point Detail) information, .OPTIONS, .MODELS, etc.

Labs:

Attendance at labs is required. Work out any conflicts with the lab UPI in advance if possible and/or arrange makeups.

There will be office hours to answer questions and help you get your lab working

Your lab experience in 3308C should be similar to your experience 3701.

1. Before starting your lab section you will be expected to:
 - a. Understand the lab handout
 - b. Analyze and build the circuits
 - c. Perform most measurements at home with your Analog Discovery board
 - d. Submit your pre-lab document on Canvas 15 min before your lab section
2. You must demonstrate your working circuit by the end of the lab section. In-lab experiments, measurements, etc., must be done by the end of the assigned lab times.
3. Questions, analysis, etc. for the in-lab portion of the handout are due by midnight the next day.

Zoom Etiquette

This class will be presented online using Zoom and requires access to a working webcam and a stable internet connection. I prefer that students keep their camera on during the class so I can see you as I would during normal face-to-face classes. Studies show that if we can see each other's faces then we will have more engagement, more student success, and more faculty success. However, if sometimes you'd rather not have your camera on due to bandwidth limitations or other reasons, that's OK.

Also, please edit your Zoom screen name so that I can tell who I'm talking to.

Please mute your microphone when you're not trying to talk.

Online Course Recording

I will be recording the lectures and will post links. Here is the UF policy concerning privacy for such recorded lectures:

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

How to study for this course:

The best way to learn how to analyze circuits and to prepare for tests is to practice. There are at least two sets of skills that you must master. One is figuring out how to approach an unfamiliar circuit or problem; the other is how to work through the solution to the problem or the analysis. If you always get help with setting up the problem, or just watch someone else solve the problem, you do not get any practice at all. To learn this material and to do well in the course, you must work problems and analyze circuits by yourself.

Software Use:

All faculty, staff and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. "We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity."

Make-Up Opportunities:

It is very hard for me to make you a customized exam. If you have a University-approved excuse and arrange for it in advance, or in an emergency, a make-up exam will of course be allowed.

Excused absences must be consistent with university policies in the undergraduate catalog <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx> and require appropriate documentation.

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. Students should share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.ua.ufl.edu/students/>. Students will be notified when the evaluation period

opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

University Honesty Policy

You are not allowed to cheat or to tolerate cheating. The University's honesty policy, which I follow, can be found at <https://sccr.dso.ufl.edu/wp-content/uploads/sites/4/2018/08/The-Orange-Book-Web.pdf>.

You may consult with other students on homeworks or projects. However, solutions or reports that you turn in must be **your work alone**. For example, you must create your own computer files and run your own simulations.

- You are expected to do your own work.
- You are expected to report any violations of the Honor Code that you become aware of.
- It is a violation of the Honor Code to turn in solutions to homeworks, labs or tests copied from other students or from published handouts or solutions.
- You are welcome to work with other students on homeworks and lab reports. However, once you understand the method of solution you should work through the calculations yourself.

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

Campus Resources:

Health and Wellness

U Matter, We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. <https://lss.at.ufl.edu/help.shtml>.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. <https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. <https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: <https://care.dso.ufl.edu>.

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process>.