

**EEE3308C Electronic Circuits
Syllabus Fall 2022 Rev. 1**

		Lecture		Topic	Text	Lab
Aug	W	24	1	Logistics, Intro to Electronics	Ch. 1	
Aug	F	26	2	Design-oriented analysis, KCL, KVL	Ch. 1	
Aug	M	29	3	Voltage/current dividers, Cascaded Amps	Ch. 1	
Aug	W	31	4	Op-Amps, Application of Op-Amps	Ch. 2	
Sep	F	2	5	Ideal vs. Non-Ideal Op-Amps	Ch. 2	1
Sep	M	5		Labor Day: No Class		
Sep	W	7	6	AC coupling, Biasing, Port Resistances	Ch. 2	1
Sep	F	9	7	GBW, Poles and Zeros, Feedback	Ch. 2,10	1
Sep	M	12	8	Diodes: Ideal and Non-Ideal	Ch. 4	2
Sep	W	14	9	Wave Rectifiers	Ch. 4	2
Sep	F	16	10	AC-DC Converters, Other Diode App.	Ch. 4	2
Sep	M	19	11	Review for Test 1		
Sep	W	21		Test 1		
Sep	F	23	12	BJTs, small/large-signal concepts	Ch. 6	
Sep	M	26	13	Biasing BJTs, BJT Ckts (Part 1)	Ch. 6-7	3
Sep	W	28	14	BJT Ckts (Part 2), Coupling/Bypass caps	Ch. 6-7	3
Sep	F	30	15	Transitioning to MOSFETs from BJTs	Ch. 5	3
Oct	M	3	16	N-MOSFET Physics and Regions	Ch. 5	4
Oct	W	5	17	P-MOSFET Physics, MOSFET I-V	Ch. 5	4
Oct	F	7	18	Biasing, small/large-signal concepts	Ch. 5,7	4
Oct	M	10	19	MOSFET amplifiers (part 1): CS, CG, CD	Ch. 5,7	5
Oct	W	12	20	MOSFET amplifiers (part 2): CS, CG, CD	Ch. 5,7	5
Oct	F	14	21	Examples and Review of MOSFET amp.	Ch. 5,7	5
Oct	M	17		Test 2		
Oct	W	19	22	Degeneration, Cascoding, Folding	Ch. 5,7	
Oct	F	21	23	Multi-stage amplifier design example	Ch. 8	
Oct	M	24	24	Current mirrors and Active load (Part 1)	Ch. 8	Spice
Oct	W	26	25	Current mirrors and Active load (Part 2)	Ch. 8	Spice
Oct	F	28	26	Differential Amp (Part 1)	Ch. 9	Spice
Oct	M	31	27	Differential Amp (Part 2)	Ch. 9	6
Nov	W	2	28	CMRR and PSRR of Differential Amp	Ch. 9	6
Nov	F	4	29	Instrumentation Amplifier, Comparator	Ch. 9	6
Nov	M-W	7-9	30-31	Frequency Response of Amp. (Part 1-2)	Ch. 10	
Nov	F	11		Veteran's Day: No Class		
Nov	M	14	32	Op-Amps Revisted: Int. Circuitry (Part 1)	Ch. 9	7
Nov	W	16	33	Op-Amps Revisted: Int. Circuitry (Part 2)	Ch. 9	7
Nov	F	18		Test 3		7
Nov	M-F	21-25		Thanksgiving Week: No Classes		
Nov	M	28	34	Logic: Inverters	Ch. 16	
Nov	W	30	35	Logic: NAND, NOR, delay	Ch. 16	
Dec	F	2	36	Logic: Transmission gate	Ch. 16	
Dec	M-W	5-7	37-38	Final Review (Parts 1-2)		

Lab 1: Intro: Thevenin, Norton, etc.	Lab 5: Tone Control
Lab 2: Non-Ideal Op Amps	Spice Workshop
Lab 3: Diodes	Lab 6: BJT Amplifiers
Lab 4: MOSFET Common-Source Amp	Lab 7: CMOS Logic

EEE3308C Electronic Circuits

Fall 2022

Description: Fundamentals of electronic circuits and systems. + Lab.

Prerequisites: EEL 3111C Circuits 1

Class times: MWF 7th period (01:55 – 2:45 PM)

Room: NEB 0202

Professor: Najme Ebrahimi (najme@ece.ufl.edu), Baibhab Chatterjee (chatterjee.b@ufl.edu)

UPIs:

Trevor Free	(tbrian.free@ufl.edu)
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Course Organization: Each major topic will include homework assignments and labs emphasizing practical applications. There will be three in-class tests. No final exam.

Textbook: A. Sedra and K. Smith, *Microelectronic Circuits*, 8th Ed. (You will need access to the textbook. Digital is fine.)

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

Parts Kit: **You will need to order your own parts.** See Parts List on the Canvas page.

Grading:

HW (10@2% each): 18% (drop lowest one)

Labs, projects (7@4% each): 28%

Tests (3@18% each): 54%

Course Themes:

- Practical electronics: How do you create circuits to do useful things?
- Basic electronic elements
- Design-oriented analysis

Labs/ Times: NEB 0109

1	12087	Monday	9 – 10	(04:05-06:00 pm)	UPI: TBD
2	12088	Monday	11-E1	(06:15-08:10 pm)	UPI: TBD
3	12089	Tuesday	9 – 10	(04:05-06:00 pm)	UPI: TBD
4	12090	Wednesday	11-E1	(06:15-08:10 pm)	UPI: TBD
5	12091	Thursday	11-E1	(06:15-08:10 pm)	UPI: TBD
6	26872	Tuesday	11-E1	(06:15-08:10 pm)	UPI: TBD
7	26873	Tuesday	2-3	(08:30-10:25 am)	UPI: TBD

UPI Office Hours: TBD

Homework: ~ 1 per week

- Usually assigned Monday; due by class start time on Friday, where solutions will be discussed
- Goals are to illustrate and reinforce lecture topics and provide practice for quizzes
- Lowest score will be dropped
- It's OK to work in groups or to get tips from other students; but 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. But feel free to discuss/ask questions to the instructor.
- Turn in homework online 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 will be in-person. However, previous year's recorded videos will also be made available through mediasite, whenever required. It is strongly encouraged to attend the in-person lectures so you can ask questions and participate in the class. For certain scenarios when the instructor is traveling, classes will be arranged through Zoom and will be notified ~1week early.

Zoom Etiquette, whenever applicable:

I can teach more effectively if you keep your video on and audio off during lectures.

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

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

Textbook: Anything in an assigned chapter of the book is fair game unless I 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; try assigning yourself design problems and look at other books.

SPICE Assignments:

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

Labs:

Labs in 3308C are run similarly to 3701.

1. Before starting your lab section you will be expected to:
 - a. Understand the lab manual
 - 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 your lab section
3. A **lab handout** will be provided on Canvas for each lab. The lab handout is broken into pre-lab and in-lab sections. They will be graded separately.
4. The pre-lab steps and results are due before the lab starts.
5. You complete the in-lab steps while in contact with your UPI, and turn in
6. Failure to do any of these will negatively affect your lab score
7. **Lab Manuals** and **Pre-Lab documents** will be accessible before your lab date
8. There will be office hours to answer questions and help you get your lab working

Academic 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.

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.

Disabilities Accommodations:

Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

UF Religious Holiday Policy:

“Students, upon prior notification of their instructors, shall be excused from class or other scheduled academic activity to observe a religious holy day of their faith. No major test, major class events or major university activity should be scheduled on a major religious holiday. Professors and university administration shall not penalize students who are absent from academic or social activities because of religious observance. Students shall be permitted a reasonable amount of time to make up material or activities covered in their absence.”

To excuse religious holidays, students need to give the instructor a 1 week notice prior to the specific holiday.

UF Counseling Services:

Resources are available on-campus for students having personal problems or lacking clear career and academic goals. Resources include:

- University Counseling Center, 301 Peabody Hall, 392-1575, Personal and Career Counseling.
- SHCC Mental Health, Student Health Care Center, 392-1171, Personal and Counseling.
- Center for Sexual Assault/Abuse Recovery and Education (CARE), Student Health Care Center, 392-1161, sexual assault counseling.
- Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.

Software Use and Pledge:

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. However, with a University-approved excuse and arranged for in advance, or in an emergency, a make-up exam will of course be allowed and accomodated.