

ECE 255

Introduction to Electronic Analysis and Design

Instructor	Teaching Assistants	Course Information
Mark Lundstrom	Rayane Chatrieux	Spring 2019
Office: 3055 Wang Hall	rchatrie@purdue.edu	
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Office Hours: MWF	Aman Maskay:	3 credits
3:30 PM – 4:30 PM	maskay@purdue.edu	Grades available on
(or by appointment)		Purdue Blackboard

Office Hours (MSEE 180):

Mon:	8:30 – 10:20 AM 3:30 – 5:00 PM
Tues:	8:30 – 10:20 AM 11:00 – 1:00 PM
Wed:	8:30 – 10:20 AM 4:00 – 6:00 PM
Thurs:	8:30 – 10:20 AM 11:00 – 2:00 PM
Fri:	9:00 – 10:20 AM 5:00 – 7:00 PM

Course Description

ECE 255 is about electronics circuits with “active” devices (specifically transistors) that can amplify and transform signals (e.g. to compute and communicate). The course is also about some more general ideas, such as linearizing nonlinear problems, modeling complex devices with equivalent circuits, using CAD tools, solving open-ended problems, etc. Specific topics: diodes, bipolar transistor and FET circuit models for design and analysis of electronic circuits. Single and multistage analysis and design; introduction to digital circuits. Computer aided design calculations, amplifier operating point design, and frequency response of single and multistage amplifiers. High frequency and low frequency designs are emphasized.

Prerequisites

EE 201: Basic circuit analysis including Ohm’s and Kirchoff’s Laws, loop and nodal analysis, Thevenin and Norton equivalents, sinusoidal forcing functions, phasors, impedance and admittance.

Learning Objectives

Students who successfully complete this course will learn some basic fundamentals of electronics while also being introduced to some more general ideas, such as linearizing nonlinear problems, modeling complex devices with equivalent circuits, using CAD tools, solving open-ended problems, etc. A student who successfully fulfills the course requirements will also have demonstrated some specific skills and knowledge:

- i. The ability to identify and correctly utilize the external lead structure and basic electrical characteristics of common semiconductor devices (pn junctions, MOSFETs, and BJTs).
- ii. The ability to analyze and design d.c. bias circuits.
- iii. The ability to utilize d.c. and a.c. models of semiconductor devices in both analysis and design.
- iv. The ability to analyze and design single and multistage amplifiers at low, mid and high frequencies.
- v. The ability to use a CAD tool (SPICE) in circuit analysis and design.

Required Text

Microelectronic Circuits, 7th Edition, Adel S. Sedra and Kenneth C. Smith, 2010.

Additional References:

Microelectronic Circuits Design, 4th Edition, Jaeger and Blalock, 2010.

The Art of Electronics, Horowitz and Hill, 1989 (good book for practical aspects of electronic circuit design)

Grading:

Exam #1	20%	(02/07/2019)	6:30-7:30 PM	LILY 1105
Exam #2	20%	(03/05/2019)	6:30-7:30 PM	PHYS 112
Exam #3	20%	(04/02/2019)	6:30-7:30 PM	PHYS 112
Final:	20%	TBA		
Homework	5%			
In class exercises:	5%			
SPICE Projects:	10%			

- All exams are closed book closed notes. The only calculator allowed in the exam is the TI-30X IIS (available at University Book Store or Follett)

Grades for exams, projects, homework and in class exercises will be posted on Black Board Learn. Course grading will utilize +/- grade scale (i.e. A/A-/B+/B/B-...). Satisfaction of the listed learning objectives and outcomes will be evaluated by scores on the corresponding exams and/or SPICE projects.

How to Succeed in This Course

- Do the assigned reading **before class**
- Attend class and pay attention
- Review the lecture after class
- Do the HW **without** looking at the solutions
- Review and understand the solutions
- Be sure you **understand** the in class exercises
- Ask questions
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Course Policies

- **Come to class on time.**
- **No devices** (e.g. cell phones, laptops). Come to focus on ECE-255.
- **No late homework will be accepted.**
- An **incomplete grade** is only for students who do most of the required work and at the end of the semester due to a **well-documented emergency** cannot finish the course.
- **No make-up exams** will be given.
- **Only in well-documented emergency situations** will I allow a student to take the exam at a different time, no other excuses are accepted. Hunting, fishing, family reunions, fraternity events are not considered emergencies.
- You cannot do extra work after the semester is over to change your grade. **All grades are FINAL once submitted.**
- If you have any issue or difficulty with the course you need to **contact me during the semester and seek help in advance.**

Academic Dishonesty

Every member of the Purdue community is expected to practice honorable and ethical behavior both inside and outside the classroom. Any actions that might unfairly improve a student's score on homework, quizzes, or examinations will be considered cheating and will not be tolerated.

Examples of cheating include (but are not limited to):

- Sharing results or other information during an examination.
- Bringing forbidden material or devices to an examination.
- Working on an exam before or after the official time allowed.
- Requesting a re-grade of answers or work that has been altered.
- Submitting homework that is not your own work.
- Submitting an in-class quiz for another student.

At the instructor's discretion, cheating on an assignment or examination will result in a reduced score, a zero score, or a failing grade for the course. All occurrences of academic dishonesty will be reported to the Assistant Dean of Students and copied to the ECE Associate Head of Education. If there is any question as to whether a

given action might be considered as cheating, please see the instructor for the teaching assistant before you engage in any such action.

Attendance

You should attend class because you will do better in ECE-255 if you do. The only way to receive credit for the in-class exercises is to attend class. If you receive credit for 80% of the in-class exercises, you will be given 100% of the points. Note that **filling out an in-class exercise for another student is considered cheating and will result in an F for the course and a report to the Dean of Students.**

Emergencies

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. Here are ways to get information about changes in this course.

- Course webpage
- Instructor's email
- Instructor's phone

Relevant changes to this course will be posted onto the course website or can be obtained by contacting the instructors or TAs via email or phone. You are expected to read your @purdue.edu email on a frequent basis.

See the University's website for additional information:
https://www.purdue.edu/epps/emergency_preparedness/

Class Schedule

Specific reading assignments for each week are attached.

Course Web Page

Grades will be posted on Purdue Blackboard. Information about the course, such as weekly reading assignments, homework assignments and solutions, supplemental material, announcements, grades, etc. will be posted at :

https://nanohub.org/groups/ece255_2019

Disclaimer

This syllabus is subject to change.