INFORMATION ABOUT THE 1st MIDTERM EXAM

Additional Office Hours:

The week of the midterm we will hold regular office hours through Wednesday. On Thursday and Friday, we will hold office hours as follows: (these are more than usual)

- **Qiutong Jin**
  - Thursday, Oct. 29, 11 a.m.-1 p.m., via Zoom
  - Friday, Oct. 30, 1-2 p.m., via Zoom

- **Kieran Peleaux**
  - Thursday, Oct. 29, 1-2 p.m., via Zoom
  - Friday, Oct. 30, 9-10 a.m., via Zoom

- **Prof. Nguyen**
  - Thursday, Oct. 29, 5-6 p.m., via Zoom

You will receive Zoom links for these office hours.

Review Session:

- Wednesday, Oct. 28, 9-11 p.m. PT, via Zoom

Date of Exam:

- Friday, Oct. 30, 9-11 p.m. PT

Exam Logistics:

- This will be a remote exam. We will release the exam on Piazza at 9:00 p.m. PT sharp. The first page of the exam will have an Honor Pledge that you will need to sign. If you cannot print out that page, then please write out the Honor Pledge on your own paper (that you will also use to write out your exam answers) and sign it. When taking the exam, make sure your writing is dark enough to scan well. It is best to use a dark pen. You must turn in your exam before 11:00 p.m. PT. Make sure you leave enough time to scan your solutions and email the pdf file to Prof. Nguyen at ctnguyen@berkeley.edu, Kieran Peleaux at kpeleaux@berkeley.edu, and Qiutong Jin at qiutong-jin@berkeley.edu before 11:00 p.m. PT.

General Information:

- You must work on this exam alone. The exam will be open book, and you can use a calculator. You should show and include all your work on your exam sheets. The exam will consist of a few problems, each with a number of parts.

Material to be Covered:

- Reading in Sedra & Smith, class lecture notes, handouts, and homework. The exam is meant to include all material covered so far in the class. You might pay more attention to the following areas:

  1. Frequency response calculation and determination. Be familiar with Bode plots (both gain and phase) and know how to determine the frequency response of circuits containing reactive components (e.g., capacitors).
2. Op-amp circuits. Know how to analyze various op-amp circuits that utilize feedback. Specifically, know the characteristics and operation of inverting and non-inverting amplifiers, and be prepared to analyze other (possibly unfamiliar) op-amp circuits. Make sure you understand the differences between open-loop and closed-loop op-amp circuit performance.

3. Ideal and non-ideal op-amp operation and characteristics. Know the various op-amp nonidealities and be prepared to predict how they influence circuit performance. Understand their effect on feedback amplifier performance.

4. Semiconductor physical concepts and device operation for pn-junction diodes and transistors. Be able to determine regions of operation and the DC operating points for transistors in specified bias configurations. Also, be prepared to handle op amp circuits using transistors in their feedback loops, such as in Lab#3.

5. Interpretation of devices as nonlinear elements and methods for modeling physical devices using nonlinear models.

6. The concept of large and small signals and the need for small signal analysis. Large and small signal models for bipolar and MOS transistors and determination of small signal elements/parameters.


8. Analysis of transistor amplifiers, for various parameters, including mid-band gain and small-signal resistances.