

# **EE 382M: Analog Integrated Circuit Design**

**Fall 2019**

2:00-3:30 pm, Tue/Thu, ECJ 1.312

## **Teaching Staffs**

Instructor: Nan Sun, Associate Professor in ECE Dept.

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– (Office hours) 3:30-4:30pm, Tue/Thu

Teaching assistant: Abhishek Mukherjee

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– (Office hours) TBD

## **Prerequisite**

EE 438 with a grade of at least C-.

## **Description**

Analysis and design of analog integrated circuits; transistor models; simple and advanced current mirrors; single-ended amplifiers; differential amplifiers; operational amplifiers; frequency response; feedback theory; stability analysis; circuit nonidealities and noise; output stages; analog filters. CAD tools for circuit analysis and design.

## **Textbooks**

- Behzad Razavi, *Design of Analog CMOS Integrated Circuits*, McGraw-Hill, 2016.
- Paul Gray *et al.*, *Analysis and Design of Analog Integrated Circuits*, Wiley, 2009.
- Johan Huijsing, *Operational Amplifiers*, Springer, 2017.
- Phillip Allen *et al*, *CMOS Analog Circuit Design*, Oxford University Press, 2002.
- Tony Carusone, David Johns, & Ken Martin, *Analog Integrated Circuit Design*, Wiley, 2011.
- Behzad Razavi, *Fundamental of Microelectronics*, Wiley, 2008.
- Adel Sedra and Kenneth Smith, *Microelectronic Circuits*, Oxford, 2009.

## **Homework**

Homework will be due in class. Late homework will NOT be accepted. There is no exception to this rule, other than University-established emergency cases (a letter from an authorized official is required). The lowest HW score is dropped in final grade calculation. You are expected to make an independent attempt to solve and turn in your answers to each homework problem. You will be graded primarily on the method of your solution. The actual numerical answer accounts for a small portion of the problem score. Organize your problem solutions in a logical step-by-step fashion to get the maximum number of points. I expect you to do your best professional

looking work on your homework. POINTS WILL BE REDUCED FOR SLOPPY WORK. The easier it is to understand and follow the logic of your solution the more points you will receive.

### **Exams**

There will be a midterm and a final. The final will be given at the time scheduled by the university registrar. No make-up exams will be given. An excused absence from the midterm/final exam must be obtained in advance. In the case of an excused absence from the midterm/final exam, the final course grade will be based on the homework and the remaining exam score. Unexcused absence from the midterm/final exam will result in a grade of zero for that exam. Note that excused absence will be made only in extreme circumstances (*e.g.*, serious illness). Requests for excused absence should be made in writing and must be supported by appropriate documentation.

### **Grading**

The final grade will be a weighted average of your homework, project, and exam scores. The weightings are (subject to change):

- Homework: 20%
- Midterm: 20%
- Project: 30%
- Final exam: 30%

### **Policies on Academic Dishonesty**

I will strictly follow the university policies on academic integrity and scholastic dishonesty. For detailed description, please refer to Chapter 11 of the *Institutional Rules on Student Services and Activities* at:

<http://deanofstudents.utexas.edu/sjs/downloads/InstitutionalRules1011.pdf>

The minimum penalty for cheating is an “F.”

### **Students with Disabilities**

The university provides, upon request, appropriate academic accommodations for qualified students with disabilities. For more information, contact the Office of the Dean of Students at 471-6259, or the College of Engineering Director of Students with Disabilities, 471-4321.

### **Religious Holy Days**

By university policy, students must notify instructor of pending absence at least fourteen days prior to the date of observance of a religious holy day. If a student must miss a class, an examination, a work assignment, or a project in order to observe a religious holy day, the student will be given an opportunity to complete the missed work within a reasonable time after the absence.

### **Classroom Evacuation for Students**

All occupants of university buildings are required to evacuate a building when a fire alarm and/or an official announcement is made indicating a potentially dangerous situation within the

building. Familiarize yourself with all exit doors of each classroom and building you may occupy. Remember that the nearest exit door may not be the one you used when entering the building.

If you require assistance in evacuation, inform your instructor in writing during the first week of class. For evacuation in your classroom or building:

- Follow the instructions of faculty and teaching staff.
- Exit in an orderly fashion and assemble outside.
- Do not re-enter a building unless given instructions by emergency personnel.