

Course Syllabus

Course Information

EE 4340.001 / EECT 5340.001 Analog Integrated Circuit Analysis and Design

Spring 2013

Tues & Thurs : 2:30pm-3:45pm, FO 2.208

Professor Contact Information

Prof. Jin Liu

(972) 883-4393, jinliu@utdallas.edu, ECSN 4.506, www.utdallas.edu/~jinliu

Office Hours: After class and by appointment

Course Pre-requisites, Co-requisites, and/or Other Restrictions

Pre-requisite: EE3311 Electronic Circuits

Course Description

Application of MOSFET and BJT large-signal and small-signal models to analyze and design amplifiers, analysis and design of current mirrors and differential amplifiers, analysis of frequency response of amplifiers, and feedback theories.

Student Learning Objectives/Outcomes

EE 4340 / EECT 5340:

Ability to understand and apply MOSFET and BJT large-signal and small-signal device models

Ability to analyze large-signal and small-signal characteristics of single-stage amplifiers intuitively

Ability to analyze and design current mirrors

Ability to analyze and design differential amplifiers

Ability to analyze frequency response of amplifiers

Ability to understand and analyze feedback topologies

Additional for EECT 5340:

Ability to design and characterize simple amplifiers according to design specifications in

Cadence CAD software

Required Textbooks and Materials

Paul R. Gray, Paul J. Hurst, Stephen H. Lewis, and Robert G. Meyer, *Analysis and Design of Analog Integrated Circuits*, John Wiley & Sons, Inc., 5th edition, 2009. (ISBN: 0470245999)

or

Behzad Razavi, *Design of Analog CMOS Integrated Circuits*, McGraw-Hill, 2001. (ISBN: 0072380322)

Suggested Reference Books

Adel S. Sedra and Kenneth C. Smith, *Microelectronic Circuits*, Oxford University Press, 5th edition, 2003. (ISBN: 0195142519)

Phillip E. Allen and Douglas R. Holberg, *CMOS Analog Circuit Design*, Oxford University Press, 2nd edition, 2002. (ISBN: 0195116445)

Assignments & Academic Calendar

Topics	Readings	
	Gray	Razavi
Course Introduction & Introduction to Analog IC		
MOSFET Model - Large Signal BJT Model - Large Signal	Chap. 1	Chap. 2
MOSFET Model - Small Signal BJT Model - Small Signal	Chap. 1	Chap. 2
Single-Stage Amplifiers - CS, CS with SD, CD, CG & Cascode	Chap. 3	Chap. 3
Differential Amplifiers	Chap. 3	Chap. 4
Current Mirrors & Active Loads	Chap. 4	Chap. 5
Amplifier Basics		Chap. 9
Input Offset Voltages	Chap. 4	
Feedback	Chap. 8	Chap. 8

Grading Policy

Students enrolled in the graduate level EE5340 course has additional requirement on the circuit design knowledge than students enrolled in the undergraduate level EE4340 course. A design project will be assigned for students enrolled in EE5340. Students enrolled in EE5340 will be graded separately from students enrolled in EE4340. The corresponding grading policies of these two courses are listed below.

For EE 4340, the final grade will be determined using the following scheme:

Homework x 30% + Midterm Exam x 30% + Final Exam x 40%

For EECT 5340, the final grade will be determined using the following scheme:

Homework x 20% + Project x 10% + Midterm Exam x 30% + Final Exam x 40%

Homework will be assigned on a bi-weekly basis and be collected at the beginning of the class on the due date. *No late homework is allowed.* The homework solution will be posted on the professor's webpage, with password protection.

All exams are closed book with a one-page note allowed for the Midterm Exam and a two-page note for the Final Examination.

Course & Instructor Policies

Students are responsible for all course materials, announcements, notes, etc. given during our regular class meeting time.

It is the responsibility of the instructor to encourage an environment where you can learn and your accomplishments will be rewarded fairly. Any behavior that compromises the University's rules of academic honesty will be reported to the University.