

EEE 296R - Mixed-Signal Integrated Circuit Seminar

Elective Course

Date: 2/28/07

Microelectronic Design area

Course Coordinators: Perry L Heedley and Thomas W Matthews

Catalog Description:

This course is a weekly seminar series for students in the area of mixed-signal integrated circuits. Topics will be on both practical issues important to IC designers and current and emerging areas of interest to industry. Speakers will include industry experts and students presenting select journal and conference papers. Time will be reserved at the end of presentations for discussion of topics between students and presenters. Students will learn and practice the techniques and styles used in successful presentations. 1 unit.

Prerequisites: EEE 230 or consent of the instructor.

Text: None

Additional Resources: Journal and conference papers on select topics.

Course Objectives:

This course will allow students working in the area of analog and mixed signal integrated circuits to learn about both practical issues important to IC designers and current and emerging areas of interest to industry. Students will have the opportunity to hear and discuss topics with speakers who are industry experts. Students will also learn and practice the techniques and styles used in successful presentations by researching and presenting select journal and conference papers.

Prerequisites by Topic:

1. Integrated circuit devices and models
2. Single-stage and differential amplifiers
3. Current sources and active loads
4. Operational amplifiers, including frequency response and compensation
5. Feedback concepts, including the use of ideal op amps

Topics Covered:

1. The use of effective techniques to give professional presentations
2. Current mixed-signal issues and trends
3. Current and emerging areas of interest to the mixed-signal industry

Evaluation: Grades will be assigned based on the student's presentation given in this seminar and their ability to explain and discuss the topic of their talk effectively. Class participation during the discussion of other speaker's talks will also be considered.

Course Outline/Schedule:

This course will consist of a 1 hour per week seminar series. Topics presented will vary each semester according to the timeliness of the subject, interest to students, and availability of industry experts as speakers. However, typical topics include practical issues such as :

- The IC product life cycle – from concept through design, fabrication, testing and production
- Designing test modes into ICs to aid in evaluation and debug
- Communicating effectively in design reviews – how to prevent bugs from reaching silicon
- The life of a practicing engineer – what to expect and what industry expects of you
- Key characteristics and traits of successful analog & mixed signal engineers

As well as technical topics such as :

- Architectural tradeoffs in Gigabit Ethernet analog front-ends
- Circuits for high speed serial data communications (XAUI, PCI-Express, etc.)
- Clock and data recovery techniques
- New process directions and design challenges in deep sub-micron CMOS processes
- Packaging and test board requirements for > 1 GHz ICs