ECE 422/522 Analog Integrated Circuit Design II Syllabus January 2015

Course Description

Analysis and design of BJT and MOS operational amplifiers, current-feedback amplifiers, wideband amplifiers and comparators. Frequency response of amplifiers. Feedback techniques, analysis and design. Stability and compensation of amplifiers, high slew-rate topologies, Noise in IC circuits. Fully differential circuits, analog multipliers and modulators. CAD tools for circuit design and testing. Prerequisites: ECE 421/521

Schedule--Winter Quarter 2015
Monday and Wednesday 4:40 - 6:30 on campus

Course Outcomes

Fluency with the use of diode, BJT and MOS structures in basic circuits
Understanding of device models
Catalog of familiar back-of-the-envelope circuit topologies for amplifiers
Understand the language and basic operation of multipliers and modulators
Quantify the noise contributions of various structures on an IC
Familiarity with the use of a circuit simulator to support analog IC design
Fluency with frequency response
Fluency with feedback techniques


Course structure: weekly study guides with homework assignments and prep material for upcoming exercises. Detailed design exercises resulting in student portfolio design/hardware and individual contributions to class project.

Grading: weekly ungraded and graded exercises and in-class project exercises.

Two In-Class exams--midterm and final. Midterm is traditional, final is design review format focused on individual student’s design portfolio.

Note: ECE422/522 is taught in Fab 10, an open classroom using design team benches. Each class will include lecture and various design activities including peer review and critique. Regular class attendance is required for success in this material.