ECE 422/522 Analog Integrated Circuit Design II Syllabus January 2018

Course Description

Analysis and design of BJT and FET operational amplifiers, wideband amplifiers, narrowband amplifiers and comparators. Frequency response of amplifiers. Filters in analog ICs. Introduction to modules. Feedback technique 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. Prerequisite: ECE 421/521

Schedule--Winter Quarter 2018
Monday and Wednesday 4:40 - 6:30 on campus

Course Outcomes

- Fluency with the use of diode, BJT FET 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.

Class project this quarter continues development of an integrated VHF envelope modulated system including low power transmitter and receiver. This quarter we will introduce I Q frequency conversion and it’s implementation in analog/RF ICs.

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

One In-Class exam. Midterm is traditional exam, final is design review format focused on individual student’s design portfolio.

Note: ECE422/522 is taught in 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.