

EE8337 Spring 2019

Analog Circuits for Wireless Communications

Credits: 3 Instructor: Ramesh Harjani, 4-165 EE/CSci, 625-4032
Time: 9:05-9:55 MWF Location: KH-3-125
Office Hours: 10:00-11:00 TuTh Location: 4-165 ECE/CSci, 625-4032, harjani@ece.umn.edu
Course website: <http://www.umn.edu/~harjani/> (then follow the links for courses/8337)

Prerequisites: (EE5333 or equivalents) or instructor approval

Course Description: This course will cover the basic background and advanced design concepts necessary to design integrated CMOS RF circuits. Emphasis will be placed on CMOS and RF however, where appropriate mention will be made of bipolar circuits and applications to other communications areas. Topics to be covered include:

- a) Introduction to wireless systems
- b) Basic concepts in RF design
- c) Communications concepts for RF design
- d) Wireless transceiver architectures
- e) Low noise amplifiers
- f) Mixers
- g) Passive devices in RF design
- h) Oscillators & PLLs
- i) RF power amplifiers (if time permits)
- j) Transceiver examples

Students will be expected to design and test several design problems. All students are also expected to complete an extensive design project. Students are expected to use Spectre RF, Matlab, Cadence and possibly ADS for design problems. Students are expected to know how to use the tools and no time will be spent on them.

Primary book: RF Microelectronics (second edition)
Behzad Razavi, Prentice Hall, 2011
ISBN-13: 978-0137134731

Reference 1: Radio Frequency Integrated Circuits & Systems
Hooman Darabi, Cambridge University Press, 2015
ISBN-13: 978-0521190794

Reference 2: The Design of CMOS Radio Frequency Integrated Circuits
Thomas H. Lee, Cambridge University Press, 2 edition (Dec '03)
ISBN: 0521835399