



ELE 508E: RF Microelectronics

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Recommended Texts:	Behzad Razavi, "RF Microelectronics", 2 nd Edition, Pearson Education, Saddle River, New Jersey, USA, 2012.
	John W. Rogers, Calvin Plett, "Radio Frequency Integrated Circuit Design", 2 nd Edition, Norwood, Massachusetts, USA, 2010.

Course description: In this course, you will learn about design of basic building blocks in radio frequency (RF) integrated circuits. RF circuits constitute the basis of modern communication systems. Designing RF circuits requires an in-depth knowledge of transistor operation and high-frequency analog circuit design concepts. This course will start from the fundamentals of RF microelectronics such as the noise, linearity, matching etc. and move subsequently to basic communication systems. Next, passive devices such as inductors, capacitors for RF designs will be reviewed. After a detailed discussion of noise calculations in analog and RF circuits, the course will analyze the key building blocks in RF circuits, namely, low noise amplifiers (LNA), mixers, oscillators, phase locked loops (PLLs), frequency synthesizers, and power amplifiers. Finally, IC and PCB layout considerations for RF circuits which are crucial for high RF performance will be inquired.

Grading: 30% Midterm, 40% Final exam, 15% Term Project, 15% HW

Topics:

02/11:	Fundamentals of RF Microelectronics	
02/18:	Introduction to Communication Systems	
02/25:	Transceiver Architectures	
03/03:	Passive Devices and Matching Circuits	HW1
03/10:	Amplifier Noise Calculations	HW1 return
03/17:	Low Noise Amplifiers (LNAs)	HW2
03/24:	Mixers	HW2 return
03/31:	Midterm	Term Paper assigned
04/07:	Oscillators	HW3
04/14:	Phase Locked Loops (PLLs)	HW3 return
04/21:	Frequency Synthesizers	
04/28:	Power Amplifiers	
05/05:	IC and PCB Layout Considerations in RF Design	
05/12:	Guest Lecturer: TBD	