ECE 7022: Advanced RFIC  
Spring, 2013  
Prof. Waleed Khalil

**Time & Place:** TTH 05:30-6:50pm, ElectroScience Lab 132

**Instructor:** Prof. Waleed Khalil  
Office: ESL Lab, 1330 Kinnear Rd  
Office hours: By appt. Only  
Email: Khalil@ece.osu.edu

Cambridge University Press, 2003  
ISBN 9780521835398.  
Instructor handouts will also be posted prior to class

**Prerequisites:** ECE 5022 (620), or Grad standing. Knowledge in Analog and IC design is highly recommended

**Grading Policy:** Five HW Projects: 100%

**Lecture Notes:** Lecture slides will be posted on Carmen prior to class  
You are encouraged to review lectures notes before the class  
Print lectures notes and bring to class.

**Catalog Description:**

This course is intended for graduate students interested to learn about RF transceiver design. The course will cover in depth all aspects of CMOS RF design at both the circuit and device level. The course will begin by an overview of the CMOS transistor and passives from RF perspective, analyzing key concepts in modeling and noise behavior. An overview of various RF circuit blocks highlighting design architectures and circuit implementation tradeoffs will be provided. This will include selected topics in designing low noise amplifiers (LNAs), mixers, voltage controlled oscillators (VCOs) and power amplifiers (PAs). The course will provide insightful guidance in the circuit design process including transistor sizing, layout effects, parasitic reduction techniques and tradeoffs between various circuit topologies. The focus throughout this course will be on providing advanced circuit design and implementation techniques utilizing numerous design examples. Students will learn how to apply tradeoffs between radio architecture and circuit design to arrive at an optimum performance.