The University of Texas at Tyler
Department of Electrical Engineering

Course: EENG 5340 – Advanced Topics in EE: RF CMOS IC Design

Syllabus

Catalog Description:

Passive integrated circuit components; CAD tools for the design and simulation of RF circuits; submicron MOSFET device physics; transmission line theory; design of high-frequency amplifiers; noise modeling and design of low noise amplifiers; design of mixers and phase-locked loops. Three hours of lecture each week. Course project(s) required.

Prerequisites: EENG 4309
or consent of instructor.

Credits: (3 hours lecture, 0 hours laboratory per week)

Text(s): T. H. Lee. *The Design of CMOS Radio-Frequency Integrated Circuits*. 2nd edition. Cambridge, 2004. ISBN 978-0521835398.

Additional Material: Class Notes; Journal Articles

Course Coordinator: David Hoe, Assistant Professor, Electrical Engineering

Topics Covered: (paragraph of topics separated by semicolons)

CAD tools for RF circuit design; RLC components; Modeling submicron transistors; High frequency amplifier design; Electronic noise modeling; Low noise amplifier design; Mixers; Phase-lock loops.

Evaluation Methods: (only items in dark print apply):

1. Examinations / Quizzes
2. Homework
3. Report
4. Computer Programming
5. Project
6. Presentation
7. Course Participation
8. Peer Review

Course Objectives[1]: By the end of this course students will be able to:

1. Utilize passive IC components in RF circuit designs [1,2]
2. Use CAD tools to design and simulate RF CMOS circuits [1,3]
3. Describe the issues with MOSFET operation in deep submicron processes [1,2]
4. Summarize the difference between lumped and distributed interconnect models for RF design [1,2]
5. Design high-frequency amplifiers [1, 2, 3]
6. Model the noise sources in an electronic circuit [1,3]
7. Optimize the design of an amplifier for low noise performance [1,2,3]
8. Understand the design issues associated with mixers [1,3]

[1]*Numbers in brackets refer to method(s) used to evaluate the course objective.*

Relationship to Program Outcomes (only items in dark print apply)[2]: This course supports the following Electrical Engineering Program Outcomes, which state that our students will:

1. Possess a breadth and depth of knowledge in electrical and computer engineering. [1-8]
2. Possess and demonstrate oral and written communication skills. [1,3,4,5,7]
3. Demonstrate the capability to perform independent learning and investigation. [2,5,6,7,8]

[2]*Numbers in brackets refer to course objective(s) that address the Program Outcome.*

Contribution to Meeting Professional Component: (in semester hours)

Mathematics and Basic Sciences:	0	hours
Engineering Sciences and Design:	3	hours
General Education Component:	0	hours

Prepared By:	David Hoe	Date:	7 Aug 2011
Modified By:		Date:	