ECE 684: MOS Device Electronics  
Spring 2014  
Instructor: Rao Mulpuri  
Nguyen Engineering Building, Room # 3237  
Office Hours: Tuesday and Thursday 4:30 pm to 6:00 pm

This course is intended to make the student learn important physics and processing issues related to silicon Metal-Oxide-Semiconductor Field-Effect-Transistor (MOSFET). Material covered in this course is useful for people who want to specialize in Semiconductor Processing and VLSI Design areas.

**Prerequisite:** ECE 584 or its’ equivalent from another university or permission of instructor (POI). For people who are already pursuing careers in Semiconductor Processing or VLSI Design areas the prerequisite may be waived by the instructor after evaluating the student’s depth of knowledge.

ECE 684 is a foundation course in the graduate certificate program on VLSI Design/Processing.

**Syllabus:**
The following Topics will be covered on the indicated dates:

1. Properties of the MOS System – January 21 and February 28
2. MOSFET-I: Basic Theories and Models – February 4 and February 11
3. MOSFET-II: Limitations and Perspectives: February 18, February 25, March 4
4. CMOS Transistor Design – March 25 and April 1
5. CMOS Isolation – April 8
6. Latch-up in CMOS – April 15
7. Radiation Effects on CMOS Devices – April 22 and April 29
8. MOS Processing Technology – May 6

**Text Books:**
1. “Device Electronics for Integrated Circuits” by Muller, Kamins, and Chan  
2. “CMOS Devices and Technology for VLSI” by John Y. Chen,  
   Prentice-Hall.
3. “Introduction to Microelectronic Fabrication” by R. C. Jaeger,  
   Addison-Wesley, ISBN: 0-201-14695-9

**Reference Material:** Provided in the classroom.

**Grading:**
2 Exams – 40% each  
Project and Homework – 20 %