ESE 330

Integrated Electronics

Fall 2011

Stony Brook University
Department of Electrical and Computer Engineering

Course Description
An overview of the design and fabrication of integrated circuits. Topics include device fabrication and modeling; gate-level and transistor-level design; mask layout methods, design rules and processes; circuit characterization and performance estimation; computer-aided design tools and techniques. This material is directly applicable to industrial IC design and provides a strong background for more advanced courses.

Prerequisites : ESE 372

Instructor : Milutin Stanacevic
Office : 263 Light Engineering
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Classes : MW, 2:20-3:40pm, in LGT ENGR LAB 154

Office hours : MW, 12:00pm-2:00pm, or by appointment

Teaching Assistant : TBA

Textbooks :
J. M. Rabaey, A. Chandrakasan and B. Nikolic, *"Digital Integrated Circuits: A Design Perspective,"* Prentice Hall, 2nd edition, 2003.

Grading
1. Homework 10%
2. Midterm 30%
3. Final 40%
4. Project 20%

Project
There will a final design project (20% of grade). The goal of the project is the design and implementation of a modest-size CMOS digital integrated circuit. Cadence will be used as the industry-standard VLSI design and analysis tool.

Course Outline

Week 1	Introduction (ch 1.1 - 1.3)
Week 2,3	The MOS transistor (ch 3.1 - 3.3.2)
Week 4	IC manufacturing; design rules (ch 2.1 - 2.3)
Week 5,6	The CMOS inverter (ch 5.1 - 5.5)
Week 7	The wire (ch 4.1 - 4.5.2)
Week 8	Static CMOS logic (ch 6.1 - 6.2)
Week 9	Dynamic CMOS logic (ch 6.3 - 6.4)
Week 10,11	Sequential logic circuits (ch 7.1 - 7.3; 7.5-7.6)
Week 12,13	Semiconductor memories; ROM cores (ch 12.1 - 12.2.1) SRAM, DRAM, and CAM cores (ch 12.2.2 - 12.2.4)
Week 14	Peripheral memory circuitry (ch 12.3)
Week 15	Interconnect (ch 9.1 - 9.3)
Week 16	Technology trends and Emerging technologies

Access to our class's on-line Blackboard site:

You can access class information on-line at: http://blackboard.sunysb.edu
If you have used Stony Brook's Blackboard system previously, your login information (Username and Password) has not changed. If you have never used Stony Brook's Blackboard system, your initial password is your SOLAR ID# and your username is the same as your Stony Brook (sparky) username, which is generally your first initial and the first 7 letters of your last name.
For help or more information see:
http://www.sinc.sunysb.edu/helpdesk/docs/blackboard/bbstudent.php
For problems logging in, go to the helpdesk in the Main Library SINC Site or the Union SINC Site, you can also call: 631-632-9602 or e-mail: helpme@ic.sunysb.edu

Academic integrity

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Any suspected instance of academic dishonesty will be reported to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at
http://www.stonybrook.edu/uaa/academicjudiciary/