ESE330: Integrated Electronics
Fall 2004

2004-2005 Catalog Description: The course offers an overview of the design and fabrication of integrated circuits. Topics include gate-level and transistor-level level design; fabrication material and processes; layout of circuits; and automated design tools. This material is directly applicable to industrial IC design and provides a needed background for more advanced courses. 3 credits.

Course Designation: Elective for EE and CE

Text Book: Jan Rabaey, A. Chandrakasan, B. Nikolic, "Digital Integrated Circuits: A Design Perspective", Prentice Hall, 2003.

Prerequisites: ESE 372

Corequisite: none

Coordinator: Alex Doboli

Goals: The course offers an overview of the design and fabrication of integrated circuits. Topics include gate-level and transistor-level level design; fabrication material and processes; layout of circuits; and automated design tools.

Objectives: Upon completion of this course, students are able to design and simulate digital building blocks, such as registers, arithmetic units, multipliers, and registers. Students are knowledgeable to design digital circuits optimized for timing, power consumption, and area constraints.

Topics Covered:

Week 1.	Introduction to design of VLSI systems and circuits.
Week 2.	The Manufacturing Process.
Week 3.	The Manufacturing Process.
Week 4.	The MOSFET Transistor.
Week 5.	The CMOS Inverter.
Week 6.	Combinational Logic Gates.
Week 7.	Combinational Logic Gates.
Week 8.	Combinational Logic Gates.
Week 9.	Design of Sequential Circuits.
Week 10.	Design of Sequential Circuits.
Week 11.	Arithmetic Building Blocks.
Week 12.	Arithmetic Building Blocks.
Week 13.	Arithmetic Building Blocks.
Week 14:	Designing Memory and Array Structures.
Week 15:	Designing Memory and Array Structures.

Class/laboratory Schedule: 3 lecture hours per week.

Assignment Schedule and Grading

Assignment	Start Date	Due Date	Points
Homework 1	09/15	10/01	5
Homework 2	10/01	10/15	5
Homework 3	10/15	11/01	5
Homework 4	11/01	11/19	5
Homework 5	11/19	12/10	10
Midterm 1	October 22		25
Final	Exam week		40
Course portfolio			5

Document Prepared by: Alex Doboli on 08/23/04