ELEG 5263 - INTEGRATED CIRCUIT DESIGN LABORATORY II

Fall Semester, 2007

Catalog Data: 2006-07	ELEG 5263 Integrated Circuit Design Laboratory II. Students test the I.C. chips they designed in I.C. Design Laboratory I, and propose design corrections where needed. Topics include bipolar chip design, gate arrays, BICMOS, memory design, design for testability, and dynamic & domino logic.
Textbook:	*CMOS VLSI Design: A Circuits and Systems Perspective*, by Neil H.E. Weste & David Harris, Third Edition
Coordinator:	R. L. Brown, Associate Professor of Electrical Engineering
Goals:	ELEG 5263 has two main goals. The first is to teach students many I.C. technologies and techniques that could not be covered in ELEG 4233 and 5253. The second is to allow the students to test and correct the chips they designed in ELEG 5253.

Prerequisites by Topic:

1. Digital and analog electronics (ELEG 2903 & ELEG 3213 or equivalent)
2. Basic semiconductor physics (ELEG 4203)
3. C programming
4. Extensive knowledge of I.C. design from ELEG 4233 & ELEG 5253

Topics:

1. Bipolar Processing & Layout (4 classes)
2. Gate Array Overview (3 classes)
3. CMOS Gate Arrays (2 classes)
4. BiCMOS (2 classes)
5. Emitter Coupled Logic (2 classes)
6. RAM/ROM Design Overview (3 classes)
7. SRAM Design Details (3 classes)
8. Sense Amplifiers (2 classes)
9. DRAM Design Details (2 classes)
10. EPROM & FLASH Memory (2 classes)
11. Exam (1 class)
12. Design for Testability (4 classes)
13. IC Functional Testers & Testing (4 classes)
14. Dynamic & Domino CMOS Logic (2 classes)
15. Chip Scaling (1 class)
16. Wire Delay Management (3 classes)
17. Design Margining (2 classes)
18. Phase Locked Loops (2 classes)

Laboratory Project:

Students test their chips using a functional tester, and propose corrections if they do not work.

Computer Usage:

Students write C programs that generate the test vector files that drive the functional tester while it is testing their chips.

Computers: SUN workstation, IBM PC

Languages: C

Operating Systems: UNIX, DOS

ABET category content as estimated by faculty member who prepared this course description:

Engineering Science:	0.5 credits or 17%
Engineering Design:	2.5 credits or 83%

Prepared by: _____ Date: _____