ECSE 548: Introduction to VLSI Design
Course Outline

Fall 2012

Staff

Instructor Professor Brett H. Meyer, brett dot meyer at mcgill.ca, x4210
OH: Mondays 3-4 PM, and by appointment, in MC525

Hours and location

Lectures TR 8:35-9:55 AM, WONG 1030

Prerequisites

ECSE 323: Digital System Design
ECSE 334: Introduction to Microelectronics

Text

The primary reference for this course is:

Weste and Harris, *CMOS VLSI Design*, 4th edition, Addison-Wesley, 2011.

Hardcopy is available at Paragraphe Books (2220 Avenue McGill College). A digital version of the text may be purchased at CourseSmart.com. The text is also on reserve at the Schulich Library. Supplements to the text are available on the website for the text, http://www3.hmc.edu/~harris/cmosvlsi/4e/index.html.

Topics

Time permitting, the course will cover the following topics:

1. MOS transistor theory
2. IC delay and power
3. IC simulation
4. Combinatorial and sequential circuit design
5. IC testing
6. IC interconnect
7. Scaling, variability, and reliability
8. Datapath, array, and special purpose subsystems

Grading

McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see www.mcgill.ca/students/srr/honest for more information).

In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded.

If you have a disability please contact the instructor to arrange a time to discuss your situation. It would be helpful if you contact the Office for Students with Disabilities (www.mcgill.ca/osd) at 514-398-6009 before you do this.

The approximate grading breakdown is:

- Exam 1 30%
- Exam 2 30%
- Project 40%

We reserve the right to change these weights based on class performance.

Homework: Homework sets will be assigned out of the text, but not graded. Solutions are available on the website for the text.

Exams: Two exams will be held in-class, on *Tuesday, October 23* and *Tuesday, December 4*. The exams are not explicitly cumulative, though later course material builds naturally on earlier course material. As this is the first offering of this course in this format, no representative old exams are available. *The exams will be closed book,* however each student may bring *as many pages of hand-written notes as they choose* as reference material. Photocopied or electronically prepared materials are not allowed.

Project: The focus of the semester long design project will be on the implementation and optimization of an 8-bit microprocessor. The project will be divided into multiple deliverables. Some deliverables will be completed by students working alone, others by students working in groups of four. The project will be designed to make use of the Electric VLSI Design System, available from Static Free Software (staticfreesoft.com). Students have the option of using alternative tool chains, but will receive no technical support from course staff. Further details regarding the project will be available the second week of the course.

Re-grading: Students must submit any re-grading request in writing, making a comparison of their work and the solutions, and justifying their request for additional marks. At the instructor's discretion, either the problem in question or the entire assignment or exam may be re-graded.

Course Website

Consult the MyCourse course site for updates to this outline, as well as to download lecture notes, assignments, and project files.