CONCORDIA UNIVERSITY
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

COEN 315: Digital Electronics. Summer 2015

Course Outline. Revised May 31st

INSTRUCTOR

Glenn Cowan, Associate Professor, gcowan@ece.concordia.ca
Section AA: Monday/Wednesday, 1:15-4:00 pm, Room H-403
Office: EV5.167, Telephone: 848-2424 Ext. 4108
Office Hours: Wednesday noon to 1pm (H 403), others TBD

TEXTBOOK

Sedra & Smith "Microelectronic Circuits", Oxford University Press, 6th Edition

CALENDAR DESCRIPTION:

COEN 315 ***Digital Electronics*** (3.5 credits)
Prerequisite: ELEC 311. Analysis and simulation of basic digital circuit blocks, in particular, CMOS, BiCMOS and ECL technologies. The focus is on the electronics aspect of digital circuits. Combinational and sequential circuit units, including logic gates, flip-flops, signal generators, static and dynamic memories, and interconnections. Performance analysis in terms of switching speeds, power dissipation, noise immunity, fan-in and fan-out. Lectures: three hours per week. Tutorial: one hour per week. Laboratory: 15 hours total.

COURSE OUTLINE

The objective of the course is to give students the ability to analyze common digital circuits such as logic gates and memory. An introduction to design choices will also be given.

Sedra/Smith sections:
13.1-13.3 CMOS inverter and definitions
13.4 CMOS gates
13.5 CMOS scaling

14.1 Pseudo NMOS
14.2 PTL
14.3 Dynamic
14.4 ECL
14.5 BiCMOS

15.1 Latches and FFs
15.2 Memory types
15.3 RAM cells
15.4 Sense amplifiers

GRADUATE ATTRIBUTES

This course emphasizes the Canadian Engineering Accreditation Board's (CEAB) graduate attribute of "use of engineering tools." The CEAB defines this as "An ability to create, select, apply, adapt, and extend appropriate techniques, resources, and modern engineering tools to a range of engineering activities, from simple to complex, with an understanding of the associated limitations."

In particular, this course, through its labs introduces students to a range of engineering measurement equipment. Students will become familiar with key pieces of equipment and their limitations over the course of the labs.

LABORATORY

See hand out.

GRADING SCHEME

Midterm test	15%
Laboratory (incl. test)	15%
Quizzes	10%
Assignment	10%
Final Examination	50%
Total	100%

During the tests and the exam, only one of the two ENCS-approved calculators (CASIO FX-300MS and SHARP EL-531) will be allowed. No other material will be allowed inside the exam hall.

In order to pass the course, students must achieve a grade of at least 45% on the final examination.

TUTORIALS

Monday/Wednesday 4:15-5:15pm H 537

During the term many recommended problems will be suggested. Additional problems will be assigned to be completed and handed in. Teaching Assistants will review the recommended problems during the tutorials, with priority going to those questions that the students found most difficult. In most tutorials, a short quiz will be given based on the material covered in the recommended and assigned problems from the previous week.

TIPS FOR SUCCESS AND A REMINDER OF THE RESOURCES AVAILABLE FOR LEARNING

While there will always be exceptions to what is given below, the most successful Engineering undergraduate students do the following:

1. Attend virtually all lectures, and review a classmate's notes for any lectures missed.
2. Try to follow along in class, and ask questions when they are confused.
3. Review their notes between lectures, even if they do not need to do an assignment
4. Work out a number of recommended problems at home.
5. Complete all hand-in assignments.
6. Attend tutorials, and ask questions in tutorials. That is, come to tutorials having tried all of the recommended problems.
7. Have a network of classmates with whom to discuss concepts, and assignments. (Discuss does not mean copy!!)
8. Stay current with the material. It can be difficult to get caught up at the very end.
9. Prepare for labs, and complete the labs carefully.
10. View the course as a foundation for future studies and an Engineering career, rather than simply preparation for a final exam.
11. Seek help when they need it, either from the textbook, classmates, TAs, or through the professor's office hours.
12. Enjoy the course and take pride in their growing expertise.

A NOTE ABOUT EXPECTATIONS OF PROFESSIONALISM

In addition to preparing students for the technical requirements of a career in Engineering, we sincerely feel that our program at Concordia University also prepares students for a wide variety of non-technical elements Engineering careers require. An aspect of this non-technical training is the maintaining of clear expectations of professionalism in the classroom, tutorials, and laboratories. We expect that students treat one another, their TAs, lab demonstrators, specialists, and professors with respect and act honestly. It is imperative that students do not talk or make other noise during lectures, when the teaching assistants are presenting material in tutorials, or when lab demonstrators and staff are addressing lab sections.

Another important component of professionalism is academic integrity. The copying of labs and assignments is not permitted, and will be dealt with seriously. Please review Concordia's guide to academic integrity:
http://www.concordia.ca/info/currentstudents/academicintegrity/

NOTES ON PLAGIARISM:

The following is taken from http://provost.concordia.ca/academicintegrity/plagiarism/

> The most common offense under the Academic Code of Conduct is plagiarism which the Code defines as "the presentation of the work of another person as one's own or without proper acknowledgement." This could be material copied word for word from books, journals, internet sites, professor's course notes, etc. It could be material that is paraphrased but closely resembles the original source. It could be the work of a fellow student, for example, an answer on a quiz, data for a lab report, a paper or assignment completed by another student. It might be a paper purchased through one of the many available sources. Plagiarism does not refer to words alone - it can also refer to copying images, graphs, tables, and ideas. "Presentation" is not limited to written work. It also includes oral presentations, computer assignments and artistic works. Finally, if you translate the work of another person into French or English and do not cite the source, this is also plagiarism.
>
> In Simple Words:
> Do not copy, paraphrase or translate anything from anywhere without saying where you obtained it!

LIST OF SERVICES
Concordia Counseling and Development offers career services, psychological services, student learning services, etc.
http://cdev.concordia.ca/

The Concordia Library Citation and Style Guides:
http://library.concordia.ca/help/howto/citations.html

Advocacy and Support Services
http://supportservices.concordia.ca/

Student Transition Centre
http://stc.concordia.ca/

New Student Program
http://newstudent.concordia.ca/

Access Centre for Students with Disabilities
http://supportservices.concordia.ca/disabilities/

Student Success Centre
http://studentsuccess.concordia.ca/

The Academic Integrity Website
http://provost.concordia.ca/academicintegrity/

Financial Aid & Awards
http://web2.concordia.ca/financialaid/

Health Services
http://www-health.concordia.ca/