

ECE 2500 Digital Logic

Syllabus for Fall, 2009 (Rev 9-8-09)

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Hours: T&R 10:45 to 11:45 a.m.

Course Objective

The purpose of this course is to learn and develop techniques for designing digital logic circuits found in the chips used in computers and handhelds, such as the iPod. Specifically, we will study digital technologies and design methods interwoven with such things as microprocessors, USB drives, CD/DVD drives and LCD displays. We will also look at the use of computer-assisted VHDL design tools commonly used in logic design industry.

Materials Used in Class:

1. **Text:** *Introduction to Logic and Computer Design*, 1st Ed., by Alan Marcovitz, McGraw-Hill, 2007. We do not use the CD in the back of the textbook.
2. **Online homework registration:** Go to <http://www.mharis.com> and press the *Student* button. On the following screen, enter **888-CA-4F4** in the Section Enrollment Code box. In subsequent screens you will be asked to enter your email address, a password and a security question. On the payment screen go to the right side [*Don't have a Code?*] and press the *Buy Online* button to pay a \$15 fee. (Good for 1 year.)
3. **Lab notebook** (permanent bound --spiral or hardbound), pages lined with square grid; alternating white and yellow or blue paper (yellow/blue paper used for copies to be turned in to the lab instructors).
4. **Wireless Western:** A web site has been provided for this course containing syllabus, lecture notes, weekly prelab assignments and quizzes. Students with laptop computers may access these materials anytime, as well as participate in on-line in-class activities during lecture. The website is at: <http://homepages.wmich.edu/~johnson/ece250>

Exams and Quizzes: There will be two hourly exams, plus a two-hour final exam. The date of these exams are: **Tuesday, October 13th** and **November 24th**; with the **FINAL EXAM** being **Wednesday, December 16th, 10:15 am in the morning**. Exams are closed book/notes/calculator and consist entirely of multiple-choice questions, and are computer graded. The exam questions are similar in subject to that found on the weekly web quizzes. The final is comprehensive over all course material; including the first two exams and all web quizzes. Students are *required* to attend all exams as scheduled; failure to do so will in a zero score for any examination not attended (if an emergency arises, you must contact the instructor *before* any examination)

Lab work: 10 experiments and two lab assessment exercises. (12 total lab meetings) Most laboratory experiments require prelab work in the form of written calculations in your lab notebook or computer simulations. If you don't show up for a lab, you forfeit the points associated with the entire lab that week, and generally cannot later make up the lab. Exceptions will be made only for those individuals who contact their lab instructor *before* the lab, giving an adequate reason why they cannot attend that day. Contact your lab instructor at his/her office hours for help with lab calculations. Note: you must also achieve a passing grade in the lab in order to pass the entire course.

Homework: HW problems are submitted on-line (see point 2 above). HW problems change each time they are viewed and may be done more than once to improve score, until due date. Start early to earn best scores.

WMU Honesty Policy: Attempting to obtain credit for work (lab, hw, exams) done by somebody else is illegal and punishable in this class. You are responsible for making yourself aware of and understanding the policies and procedures in the Undergraduate (pp. 274-276) [Graduate (pp.25-27)] Catalog that pertain to Academic Honesty. These policies include cheating, fabrication, falsification and forgery, multiple submission, plagiarism, complicity and computer misuse.

Grading: Grades will be determined on the basis of the following guaranteed grade scale:

Exam I	20%	93 - 100	A
Exam II	20%	87 - 92	BA
Homework	10%	80 - 86	B
Lab Work	25%	74 - 79	CB
Final Exam	25%	68 - 73	C
	100%	63 - 67	DC
		58 - 62	D
		0 - 57	E

GENERAL COURSE SCHEDULE FOR ECE 2500, Fall 2009

(May be revised)

Week	Lecture Topic	Reading	Lab Exercise ¹
<i>September</i>			
8 10	The Digital World	1.1-1.3*	NO LABS
15 17	Number Systems, Boolean	2.2-2.4, 2.7-2.8	1 CD/DVD drives
22 24	Algebra, Combinational Logic	2.6	2 Microprocessor Logic
<i>October</i>			
29 1	Circuits, Minterms and K-maps	2.5, 3.1	3 LCD Logic
6 8	Maxterms* and more K-Maps	3.2-3.4*	4 Logic Design: 7-Seg
13 15	Exam I (October 13 10)²	none	5 Logic Design: Adders
20 22	Important CLCs	4.2-4.5	6 Standard Logic Circuits
27 29	PLD structure, SLC Intro	4.6, 5.1-5.2	7 Lab Assessment#1³
<i>November</i>			
3 5	Flip Flops & Clocks	5.3	8 Latches & Static Memory
10 12	Sequential Logic Circuit Design	6.1-6.3*	9 Flip-Flops & Registers
17 19	More SLC Design	6.4*	10 Sequential Logic Design
24	Exam II (November 24)²	none	NO LABS
<i>December</i>			
1 3	Important SLCs	7.1-7.3*	11 Advanced SL Design
8 10	Finish and Review	8.1+*	12 Lab Assessment#2³

FINAL EXAM is Wednesday (Wednesday December 16th), 10:15 am in same room.

Notes:

1. Lab exercises available weekly on-line on the ECE 2500 homepage. Most labs require prelab work.
2. If WMU should officially close due to bad weather (or any other problem) on a date of an exam, the exam shall take place at the *next* lecture time.
3. A *lab assessment* is a one hour open book/notes lab exam taken on an individual basis. The assessment involves written calculations as well as hands-on lab work. If you are working in a group of two, one of you will arrive at the beginning of the lab period to take your assessment; the partner will then arrive one hour afterwards to take his/hers. The assessments are worth four times the points of a regular lab.

* Much more detail is provided in the lecture notes than in text; don't miss these lectures.