

**Spring 2008**  
**ECEN 248 – Introduction to Digital Systems Design**  
**8:00-9:15AM TR 103 ZEC**

Professor

Dr. Xi Zhang  
458-1416

333N WERC  
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Office Hours

TBA

Section #	Lab Time	Lab Location	TA
501	T 05:15PM-08:15PM	ZACH 115C	TBA
502	M 12:40PM-03:40PM	ZACH 115C	TBA
503	W 03:00PM-05:50PM	ZACH 115C	TBA
507	M 04:10PM-07:10PM	ZACH 115C	TBA

Weekly Problem Solving Session (attendance is optional)

Day, Time, Location TBA

Required Text

Fundamentals of Digital Logic with VHDL Design, S. Brown and Z. Vranestic, McGraw Hill Co., 2005, 2<sup>nd</sup> edition

Supplemental Texts

Contemporary Logic Design, Randy H. Katz, Benjamin/Cummings Publishing Company, 1994

Fundamentals of Logic Design, Charles Roth, 2<sup>nd</sup> Edition, West Publishing Company, 1979

Digital Design: Principles and Practices, John Wakerly, 2<sup>nd</sup> Edition, Prentice Hall, 1994

Lab Manual

The lab manual is available on my website: <http://dropzone.tamu.edu/~xizhang/ECEN248>.

**Lab 1:** Students need to buy a lab kit from the MSC. Without the lab kit, you will be unable to complete the lab.

Course Objectives

At the conclusion of this course, you should:

No.	Course Learning Objectives
1.	Be able to distinguish between analog and digital circuits; <i>lecture</i>
2.	Be able to explain the difference between combinational and sequential digital circuits; <i>lecture</i>
3.	Be able to describe the fundamental concepts of the theorems of Boolean Algebra. Using Boolean Algebra theorems, be able to minimize AND-OR combinational circuit realizations; <i>lecture and lab</i>
4.	Be able to design combinational circuits using basic logic gates; <i>lecture and lab</i>
5.	Be able to apply Karnaugh Maps, up to six variables, as a tool in designing combinational circuits. Be able to describe the relationships between operations performed using these tools and equivalent Boolean Algebraic manipulations; <i>lecture and lab</i>
6.	Be able to compute digital numerical representations including unsigned and signed integer representations, and floating point formats for rational numbers; and be able to convert between these representation; <i>lecture and lab</i>
7.	Using combinational circuit, be able to analyze the design standard arithmetic circuits that involve signed addition, subtraction, and multiplication; <i>lecture and lab</i>
8.	Be able to analyze and design combinational digital circuits using building blocks such as

	multiplexers, ROMS, PLAs, PALs, and decoders; <i>lecture and lab</i>
9.	Be able to analyze and design standard synchronous sequential circuits using primitives such as latches, flip-flops, registers, and counters; <i>lecture and lab</i>
10.	Be able to explain the fundamentals of clocking logic and how to avoid the adverse affects of logic hazards; <i>lecture</i>
11.	Be able to explain basic MOS technology issues related to logic circuits implemented with transistors; <i>lecture</i>

### Grading

Scale		Homework	15%
90 - 100	A	Laboratory	15%
80 - 89	B	In-class exercises	10%
70 - 79	C	Exams (each with 20%)	60%
60 - 69	D	3 exams & final (drop lowest)	
Below	F	Total	100%

### Exams

Exam 1	Thur., Feb. 14
Exam 2	Thur., Mar. 20
Exam 3	Tues., Apr. 22
Final Exam	Mon., May 5, 1-3pm

### Drop Dates

Friday, January 18, 2008, Last day to drop with no record  
 Tuesday, April 1, 2008, Q-drop – Last day to drop with no penalty

### **American Disabilities Act**

The American Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a leaning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Director of Counseling and each of your course instructors.

### **Scholastic Dishonesty**

As commonly defined, plagiarism consists of passing off as one's own ideas, work, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. If you have questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, under the section "Scholastic Dishonesty."

### **Copyrights**

Please note that all handouts and supplements used in this course are copyrighted. This includes all materials generated for this class, including but not limited to syllabi, exams, in-class materials, review sheets, and lecture outlines. Materials may be downloaded or photocopied for personal use only, and may not be given or sold to other individuals.

## POLICES AND PROCEDURES

1. Students are expected to read the textbook and review the web notes (if necessary) before the topic is covered in class. Reading assignments are listed on the class website. Class time will include a variety of activities that address topics from the textbook or supplemental material. You are responsible for mastering all topic listed in the syllabus.
2. **Exams:** There will be three exams and a final exam. The final exam will be comprehensive of all material covered. It is optional and can be used to replace your lowest exam grad. If you choose not to take the final, your first three exam grades will be used in calculating your final grad.
3. **Absences:** If you miss an exam without a certified medical excuse or prior instructor approval, you may take a makeup exam at a designated time near the end of the semester. Only one makeup exam will be given. It will be challenging! Exams missed with certified medical excuses or prior instructor approval will be dealt with individually. If you miss the final exam without a valid excuse, it will be assumed that you wish to drop that exam score.
4. **Homework:** Homework assignments are due at the beginning of the class period. If you arrive late, you should submit homework **immediately** upon entering the class. Homework will be accepted up to one class period after the due date. Late homework will receive a maximum grade of 75% of the earned score. However, if an individual abuses this privilege by routinely handing in homework late, the privilege will be withdrawn. For each homework assignment, random problems will be graded. Solutions will be provided on the class website for most problems.
5. **In-class activities:** In-class exercises and quizzes will be regularly given. If you have an unexcused absence, you will receive a zero. Make-ups will not be given.
6. **Course Website:** A course website has been set up through my website:  
<http://dropzone.tamu.edu/~xizhang/ECEN248>
7. There will be a “fuzzy area” between each two letter grades in the final distribution, so that two people getting the same average grade could get different letter grades. If you are in one of these fuzzy areas, whether you get the higher or lower grade depends on three factors: (i) your consistency in submitting homework assignments, (ii) participation in class activities, and (iii) whether your test performance has been improving or declining.