

## ECE 273 – Digital Logic

### Summary:

ECE 273, Digital Systems, provides an introduction to digital logic. Topics include numbers and coding systems; Boolean algebra with applications to logic systems; Karnaugh and Quine-McCluskey, minimization; combinatorial logic design; flip-flop; sequential network design; and design of digital logic circuits.

**Instructor:** Chris Kreucher (BSEEE '97, MSEEE '98) is currently a research scientist at Veridian, located in Ann Arbor, Michigan.

**Contact information:** 1) Email [ckreuche@umich.edu](mailto:ckreuche@umich.edu).

2) Drop off materials for me to the ECE office and they will be put in my mail box (make sure they are time/date stamped!); leave messages for me there as well if necessary: (313) 593-5420.

Office Hours: Mon. 6:00-7:00pm, **and by arrangement** – 215D ELB.

**Required Text:** Fundamentals of Logic Design, 4<sup>th</sup> edition, Charles H. Roth.  
A course pack is available in the bookstore and is required as well.

<b>Course Schedule:</b>	Lecture	Mon, Wed	4:40-6:00pm		
	First Class	Mon Jan 7, 2002	Spring Recess	March 3-10, 2002	
	MLK Day	Mon Jan 21, 2002	Drop Day	Mon March 18, 2002	
	Mid Term	Wed Feb 27, 2002	Last Class	Mon April 22, 2002	

### Course Format:

- 1) There will be 2 lectures each week, Mondays and Wednesdays 4:40-6:00pm. Attendance is *expected* and, although not specifically taken into account in the grading policy, will be used as the first factor if any judgment calls are necessary when assigning grades or granting extensions.
- 2) There will be a short 5-10 minute quiz most Wednesdays at 4:40, typically on the preceding weeks' lectures. *Attending* the lectures, *reading* the assigned material, and *completing* the required homework is the best way to prepare for the quizzes.
- 3) Homework assignments will be assigned but not collected. It is expected that the students complete the homework and additional problems as necessary. **If the quiz grades indicate that the students are not completing the homework assignments, homeworks will be collected.**
- 4) It is my policy *not* to give make up quizzes or exams. However, limited exceptions will be made if and only if a pre-arrangement is made.

### Grading:

1)	Approximately Ten Quizzes + Homeworks (if necessary)	25 %
2)	Lab	25 %
3)	Midterm Exam	25 %
4)	Final Exam	25 %

### Topics:

We will cover chapters 1-14. Selected topics from chapters 15-27 will be covered, time permitting.

<b>Topic</b>	<b>Chapter</b>
1. Number Systems and Conversion	1
2. Boolean Algebra	2
3. Boolean Algebra, part 2	3
4. Algebraic Simplification	4
5. Applications of Boolean Algebra	5
6. Karnaugh Maps	6
7. Quine-Mccluskey Method	7
<b>MIDTERM EXAM</b>	
8. Multi-Level Gate Networks; NAND and NOR gates	8
9. Multi-Output Networks: Multiplexers, Decoders, ROMs, & PLAs	9
10. Combinational Network Design	10
11. Flip-Flops	11
12. Counters and Similar Networks	12
13. Analysis of Clocked Sequential Networks	13
14. Derivation of State Graphs and Tables	14

**General Notes:**

- 1) Following the honor code is of the utmost importance. All assignments must have the words “I have neither given nor received aid in the preparation of this graded assignment” (or their equivalents) prominently displayed. The student's signature must be provided to signify the veracity of the statement.
- 2) The lab instructor has complete autonomy in the lab portion of this course. His grading policy and report requirements will be set forth during lab. Honor code requirements for that portion of the course will be expounded by him, if there is any room for interpretation.
- 3) This class should be a fun and rewarding experience for all involved. It is my goal that every student enjoys all of the material so that he/she may do well on all of the assignments, quizzes and exams. This material is the very important, so true learning of the concepts (and not just memorization or monkey see-monkey do) is important. If at any time you feel you do not understand a topic or problem, or have *any other concern what so ever*, please see me before/after class, during office hours or send an email and an arrangement will be made.