EECS 270:
Introduction to Logic Design

University of Michigan–Fall 2000
Prof. Janice M. Jenkins and Prof. Pinaki Mazumder

This course provides you with a basic understanding of what digital devices are, how they operate, and how they can be designed to perform useful functions. It forms the foundation necessary for the more advanced hardware and software design courses in our curriculum. You will learn about digital design through a combination of lectures, homework, and a hands-on laboratory. The laboratory is an integral part of the course that shows how the theory of digital design learned in lectures is applied in practice to construct real digital systems.

1.0 Catalog Description

EECS 270 (CS 270) Introduction to Logic Design (4 credits): Binary and non-binary systems, Boolean algebra, digital design techniques, logic gates, logic minimization, standard combinational circuits, sequential circuits, flip-flops, synthesis of synchronous sequential circuits, PLAs, ROMs, RAMs, arithmetic circuits, computer-aided design. Laboratory includes hardware design and CAD experiments.
Prerequisites: EECS 100 or equivalent

2.0 Instructional Staff

Name	Role	Room	Email
Janice M. Jenkins	Professor	4116 EECS	jenkins@eecs.umich.edu
Pinaki Mazumder	Professor	2215 EECS	mazum@eecs.umich.edu

3.0 Course Registration

To be properly enrolled you must be registered in one of the two lecture sections (Sec 001 or Sec 002) and one of the 14 lab sections (Sec 003 through Sec 009, and Sec 011 through Sec 017). You must attend the same lecture and lab sections throughout the semester. Course enrollment is limited by available lab space which is 19 students per lab period.

The lab requires that you also have a Computer Aided Engineering Network (CAEN) computer account. To open a CAEN account, or to check if you have an active account, go to the CAEN Hot Line Office in 2320 Media Union. Engineering students and declared CS majors are eligible for these accounts without paying extra fees. Other students must pay a CAEN Lab Access fee.

4.0 Textbooks and References

4.1 Required Textbook:

- John Wakerly, Digital Design: Principles and Practices, 3rd Ed., Prentice-Hall, 2000. ISBN 0-13-769191-2.

4.2 References (On reserve at the Media Union Library):

- J. P. Hayes, Introduction to Digital Logic Design, Addison-Wesley.
- M. Mano, Digital Design, 2nd Ed., Prentice-Hall.
- C. H. Roth, Jr., Fundamentals of Logic Design, 3rd Ed.
- R. H. Katz, Contemporary Logic Design, 1st Ed., Prentice-Hall.

5.0 Coursework and Grading Policy

Besides attending lectures (which I highly recommend!) you are expected to produce evidence of your performance in this course based on:

- Six homework problem sets
- Seven laboratory experiments
- Two 1-hour mid-term exams and one 2-hour final exam

The table on the last page of this handout shows the tentative plan for lectures, the dates of the exams, the due dates for the homework assignments, and the lab schedule.

Your numeric course grade will be computed according to the formula:

$$\begin{aligned}\text{Course Grade} = {} & 30\% \times \text{Mid-term exam average} + \\ & 20\% \times \text{Final exam} + \\ & 40\% \times \text{Lab grade average} + \\ & 10\% \times \text{Homework average}\end{aligned}$$

The typical average letter grade in this course ranges from C+ to B. Those with 3 or more missing lab reports will receive a failing grade. Those with 1 or 2 missing lab reports will receive 0 for the missing report when the grade is calculated and their final grade will be reduced 1 or 2 grade levels.

Re-Grading: Requests for re-grading of homework and exam problems must be received by the lecture instructor within one week after the return of the papers to the class. This applies whether or not a student was present on the day they were returned. To request a re-grade, write "Re-grade #<problem number>" on the top of the first page of the paper. Do not put any new writing anywhere else on the paper.

5.1 Homework Problem Sets

- Homework assignments will be handed out in class; they will also be posted on the class web page.
- Homework papers will be collected at the beginning of the class period in which they are due; homework turned in at the end of class is considered late. Homework is only accepted in lecture class; it is not accepted in the lab, in the hallway, or in the instructor's mailbox or office.
- Late homework will be accepted at the beginning of class in the following lecture period but will incur a 50% grade penalty. No homework will be accepted later than that.
- Solutions to the homework will be available on the class web page and in hard copy form at the Media Union Reserve Desk.
- Homework papers will be returned in envelopes on the shelves outside the lab door, Room 2431 EECS. The envelopes will be labeled with the alphabetized names of the students whose papers are in each envelope.
- Homework problem sets are to be completed and turned in by each student individually in their own writing. Xerox copies are not accepted. Students are encouraged to discuss the assignments and approaches with the professors or the lecture GSI if any difficulties arise, but copying of answers and solutions is a violation of the Engineering Honor Code (see Section 6.0).

5.2 Examinations

- The two 1-hour mid-term exams are scheduled for 7:30-8:30 PM on Friday October 13, and Friday November 17. Make-up exams will only be given for those with a valid excuse (such as a conflict with another exam). Email your request to be consid-

ered for taking the make-up exam to the lecture GSI stating your reasons; you may be asked to provide documentation to support your request.

- The final exam is on Wednesday December 20, 8:00-10:00 A.M. An alternate make-up exam for those with a valid excuse is scheduled for 10:30-12:30 on the same day.
- All exams are closed book except for a single 8.5"x11" sheet of notes. No calculators, textbooks, reference books, homework solutions, other notes, lab papers, or the like are permitted.
- The exams will be on topics selected from lectures, lab material, homework, and text reading assignments.
- Exam papers will be returned in the lecture class.

5.3 Laboratory Experiments

A detailed description of the laboratory procedures is provided in the companion handout *EECS 270 Laboratory Overview*.

6.0 Engineering Honor Code

All homework assignments, exams, and laboratory work will be conducted in accordance with the Engineering Honor Code. Information about the Honor Code and the Engineering Honor Council can be found at http://www.engin.umich.edu/org/ehc/.

7.0 On-Line Resources

The course has a web site at http://www.eecs.umich.edu/courses/eecs270 and a newsgroup at news:umich.eecs.class.270. The web page will contain last-minute changes in homework assignments, lab experiments, homework solutions, etc. It will also have reference information such as links to the Xilinx and XESS corporations, lab schedules, and office hours. The newsgroup provides a forum for discussions related to the class. In particular, it is a good place for sharing tips on how to best use the Xilinx Foundation tools.