

**THE PENNSYLVANIA STATE UNIVERSITY
MONT ALTO CAMPUS
Fall 2009**

Digital Design Lab

Instructor: Dr. Khaled Amleh, Assistant Professor of Electrical Engineering

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Office location: 314 Sci/Tech. Building

Office Hours: WF 1:00 - 2:00 and MWF 4:00 - 5:00

Course title: CMPEN 275 "Digital Design Lab"

Section: 001

Credits: 1

Lab Meeting: M 1:00 - 2:50 in 311 Sci/Tech Building

Prerequisites: Concurrent CMPEN 271, PHYS 212

Text and Material:

- Lab Notebook:
 - Each group member MUST have a bound Lab Notebook (No loose leaves). You are expected to make regular entries related to each lab experiment and what each group member did. Entries into this notebook will also aid in preparing your final reports.
- Lab Manual: (Available at the book store).
 - Digital Circuit Design Laboratory, by Dennis F. Dunn.
- LogicWorks software:
 - Available on lab computers, room 311 Sci/Tech. Building

Lab Overview:

This is a companion laboratory component to the introductory course in logic design (CMPEN271). This lab entails the practical study and design of simple logic gates, combinational logic circuits (adders, multiplexers, decoders, etc.), memory elements (e.g. flip-flops), and sequential logic circuits (state machines). There will be a total of 8 pre-labs and 10 final lab reports (there will be no pre-lab for labs 1 and 2). When writing your reports, make sure to follow the guide lines listed below.

Lab and PreLab Requirements:

- Cover Page
 - Should have your name and your lab partners names
 - The name and number of the lab
 - The date

- Introduction/Objectives
 - What is the purpose of this lab?
 - What are the various sections attempting to teach?
- Summarized Procedure
 - Briefly describe the setup for the various activities and measurements
- Results
 - State the results and perform any necessary analysis breaking it down according to the activity
- Conclusion/Discussion
 - Draw conclusions from your experiments and discuss any unexpected or interesting results

Lab Policies

The following are ground rules to help us maintain a steady progress through the semester:

- **Attendance**
 - Lab attendance is mandatory. If you miss a lab, you will receive a zero for that lab experiment.
 - Lab make-up is only permitted for extreme cases and must be supported by written documentation, such as a doctor's note.
- **Lab Reports**
 - Lab experiments will be completed during one lab session
 - Lab report will be due the following week at the beginning of the lab period.
 - It is the student's responsibility to get any missing notes or assignments. If you miss a lab, make sure to contact me or some one else in class to get important information that you might have missed.
 - Lab reports must be clean, easy to follow and stapled. Do not fold or rip from a spiral notebook.
- **General Conduct**
 - Upon completion of your laboratory assignment, you will be expected to clean up your lab bench, put cables and other materials away, and turn off the instruments.
 - The computers provided in the laboratory are for use with the assignment and/or to access copies of the laboratory assignments. These computers are not to be used to "surf the net" or for any other purposes.
 - Food and drink are not allowed in the laboratory. Spills can lead to serious electrical shock and damage to equipment.

- Courteous and mature behavior is expected. Inappropriate behavior towards other students or inappropriate comments in the laboratory will not be tolerated.

- **Contacts**

- I will keep in touch with you over the course of the semester through e-mail. Please check your e-mail, frequently.
- When sending me an email, make sure to use your PSU email account. I do not respond to emails from unidentified sources.
- Feel free to send me any comment or thought about the course. I will be glad to hear from you.

- **Academic Integrity**

Academic integrity is a basic guiding principle for all academic activity at The Pennsylvania State University, and you are expected to act in accordance with this principle. Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner. Academic integrity includes a commitment not to engage in or tolerate acts of falsification, misrepresentation or deception. Such acts of dishonesty violate the fundamental ethical principles of the University community and compromise the worth of work completed by others. The list of academic integrity violations includes cheating, copying on a test, plagiarism, acts of aiding or abetting, submitting previous work, tampering with work, ghosting, altering exams and computer theft of programs/ materials. An explicit list of examples of academic integrity violations is found at:

http://www.engr.psu.edu/Forms/AcademicIntegrity/precedent_students.pdf

This class will be expected to follow the academic integrity guidelines. Violations will be addressed using the steps outlined at

<http://www.engr.psu.edu/Forms/AcademicIntegrity/policies.pdf>

- **Disability Statement**

Students with disabilities who need accommodations in this course, should contact the instructor within the first week of classes. You may refer to the nondiscrimination policy in the Student Guide to University Policies and Rules.

Grading System

- Grades will be distributed as follows:
 - 8 Preliminary reports @5 points each = 40 pts
 - 10 Final lab reports @10 points each = 100 pts
- Total number of points (140) will be scaled out of a 100 and the final letter grade will be assigned as follows:

94 – 100	A
90 – 93	A-
87 – 89	B+
83 – 86	B
80 – 82	B-
75 – 79	C+
70 – 74	C
60 – 69	D
below 60	F

Schedule

Lab 1	Using Real Logic Devices (Part I)
Lab 2	Using Real Logic Devices (Part II)
Lab 3	Combinational Design
Lab 4	Sequential Circuits
Lab 5	Sequential Circuit Design
Lab 6	Logic Circuit Building Blocks
Lab 7	Designing with Building Blocks
Lab 8	Elevator Simulator
Lab 9	Using Real Logic Devices (Part III)
Lab 10	Traffic Light Simulator