

**State University of New York - New Paltz**  
**Department of Electrical and Computer Engineering**

<b>Course Title:</b> Digital Logic Laboratory <b>Course Number:</b> EGC-208 <b>Credit:</b> 1 <b>Co-requisite:</b> EGC230	<b>Instructor:</b> Dr. Baback Izadi <b>Office:</b> 103 Resnick Engineering Hall <b>Phone:</b> (845) 257-3823 <b>FAX:</b> (845) 257-3730 <b>Email:</b> <a href="mailto:bai@engr.newpaltz.edu">bai@engr.newpaltz.edu</a> <b>URL:</b> <a href="http://www.engr.newpaltz.edu/~bai">http://www.engr.newpaltz.edu/~bai</a>
<b>Days:</b> Friday <b>Time:</b> 9:25 AM – 12:05 PM <b>Room:</b> WSB 105	<b>Office Hours:</b> Tuesday 10:00 AM – 12:00 PM Thursday 11:00 AM – 1:00 PM And by appointment

**Course Objective:**

This course is concerned with combinational and sequential logic circuits design. It focuses on training the student to design, debug, and analyze digital circuits of moderate complexity. The course objectives are as follows:

- (i) Students will learn digital design principles and practices and implement large-scale digital systems, which incorporate digital devices at all complexity levels.
- (ii) Students will work in teams to design, simulate, and implement digital circuits using the state-of-the-art design entry package including schematic capture and VHDL.
- (iii) Students will be introduced to modern programmable logic devices and will be introduced to the use of modern computer tools for digital design.

This course will contribute to the following ABET Program Outcomes:

- a) An ability to apply knowledge of mathematics, science, and engineering.
- b) An ability to design and conduct experiments, as well as to analyze and interpret data.
- d) An ability to function on multidisciplinary teams.
- k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Mapping between the ABET Program Outcomes and this Course

Item	Level of emphasis	Assessment
a	Moderately	Lab reports
b	Strongly	Lab reports
d	Moderately	Lab reports
k	Strongly	Lab reports

\* ABET: Accreditation Board for Engineering and Technology

### **Design Team:**

**Teams of two students will complete each lab as a unit.** Team members must be active in all phases of the lab. Inactive team member can be removed at the discretion of other team member or the instructor. Inactivity of team members should be brought to the attention of the instructor. Please note that **attendance is compulsory.**

### **General Instructions:**

All materials related to the lab will be available on course website (<http://www.engr.newpaltz.edu/~bai/CSE45208/cse40208.html>.) The students should review the lab prior to the scheduled lab period and be prepared for the lab. A brief overview of the lab experiment will be given at the beginning of each new lab session.

**Each student must keep a separate lab notebook,** and record all their work (preparatory work and all their observations during the lab session) in it. Each lab should begin on a new page (with no pages left blank) and should include the **Title of the lab, Experiment #, and the Date.**

**Once the lab is completed, the teaching assistant or the instructor will sign off both the cover sheet and the notebook.**

The lab notebook must be available for inspection by the instructor and /or TA. It will be reviewed periodically and will be graded. You need to turn in your lab notebook at the end of the semester for grading.

### **Lab Report Guidelines:**

A final report (only one report per team) is to be turned in for each lab. **Late lab reports will not be accepted.** If your report is not complete by the due date, you should hand in an incomplete report for a partial credit. You should use a word processor and CAD tools to professionally document your work. The report should have the following sections:

- ◆ Departmental cover sheet (**use standard template, a copy can be found at:** [http://www.engr.newpaltz.edu/~bai/CSE45208/EGC208\\_spring.htm](http://www.engr.newpaltz.edu/~bai/CSE45208/EGC208_spring.htm)) indicating title of the Lab, course name and number, date (semester and year), and the name of each team member.
- ◆ Table of contents.
- ◆ Introduction – A brief introduction to the topic, and the experiment being carried out.
- ◆ Procedure - all design steps should be documented including the truth table, state table, state diagram, Karnaugh maps, circuitry, etc.
- ◆ Simulation results if needed.
- ◆ Conclusion (problems encountered, lessons learned, etc.).
- ◆ References

Your report should be free of grammatical and spelling errors. Your lab report should reflect only your team's work. If unreasonable similarities are recognized between the turned in reports, they will receive failing grades.

### **Grading Policy:**

- Completed lab notebook with 100% of labs signed off 15%  
(partially completed lab notebook with at least 70% of  
labs (4 labs) signed off 10%)
- Presentation 5%
- Formal lab report: 80%

Each lab report is graded on a 0-10 point scale. A report without a signature is graded on a 0-5 point scale.

**Assignments:**

Assignments will be posted on the course web site:

[http://www.engr.newpaltz.edu/~bai/CSE45208/EGC208\\_spring.htm](http://www.engr.newpaltz.edu/~bai/CSE45208/EGC208_spring.htm)

<b>Lab number</b>	<b>Title</b>	<b>Due date</b>
1	Design of a full adder (Two week)	2/12/09
2	Design of a clock using Electronic Workbench (Two weeks)	2/26/09
3	Design of a counter (two weeks)	3/12/09
4	Design of a four-bit ALU using Xilinx (three weeks)	4/9/10
5	Design of a vending machine using Xilinx (one week)	4/16/10
6	VHDL implementation of a four-bit ALU using Xilinx (three weeks)	5/7/10
	Project presentation	5/7/10

**Presentation:**

Each team is expected to make a Power Point presentation of 10 to 15 minutes on the last day of lab. You may consult with me and choose one the labs. Your presentation should include your design problem and your solution at the appropriate detail. You should conclude with encountered problems and lesson learned.

**Incompletes:**

"I" indicates that the student has done satisfactory work in the course, but because of circumstances beyond his control has been unable to finish all requirements. It is not to be given to enable a student to do additional work to bring up a deficient grade.

**Relevant Web Sites**

- Digital Logic Fundamentals: [http://www.williamson-labs.com/480\\_logic.htm](http://www.williamson-labs.com/480_logic.htm)
- Digital logic tutorial: <http://www.play-hookey.com/digital/>
- Combinational Logic Tutorial: <http://www.ee.surrey.ac.uk/Projects/Labview/combindex.html>
- Latches and Flip flops: <http://vorlon.cwru.edu/~jackie/eces301/hw/HW2/lab2.html>
- Texas Instruments Digital Logic Families:  
<http://focus.ti.com/docs/logic/logichomepage.jhtml>
- To download a demo version of Electronic Workbench click on  
<http://www.interactiv.com/html/demo.html>
- Xilinx: <http://www.xilinx.com/programs/xds1.htm>
- If you need software to view and print PDF files under Windows:  
<http://www.adobe.com/products/acrobat/readstep.html>
- If you need software to view and print Postscript files:  
<http://www.cs.wisc.edu/~ghost/>

**Special dates:**

March 12	Mid-Point of Spring 2010 semester
March 15- March 19	Spring Break. Classes resume 8:00 a.m. March 22, 2010.
March 29 – March 30	Passover (no classes)
March 31	Last day to withdraw
<b>May 7</b>	<b>Last lab session and Presentation Day</b>
May 12	Study Day
May 13	Common Exam Day

### **From Student Catalog:**

*Students are expected to maintain the highest standards of honesty in their college work. Cheating, forgery, and plagiarism are serious offenses, and students found guilty of any form of academic dishonesty are subject to disciplinary action.*

*Cheating is defined as giving or obtaining information by improper means in meeting any academic requirements. The use for academic credit of the same work in more than one course without knowledge or consent of the instructor(s) is a form of cheating and is a serious violation of academic integrity.*

*Forgery is defined as the alteration of college forms, documents, or records, or the signing of such forms or documents by someone other than the proper designee.*

*Plagiarism is the representation, intentional or unintentional, of someone else's words or ideas as one's own. Since words in print are the property of an author or publisher, plagiarizing is a form of larceny punishable by fine. When using another person's words in a paper, students must place them within quotation marks or clearly set them off in the text and give them appropriate footnoting. When students use only the ideas and change the words, they must clearly identify the source of the ideas. Plagiarism, whether intentional or unintentional, therefore, is a violation of the property rights of the author plagiarized and of the implied assurance by the students when they hand in work that the work is their own. If students have any questions about what constitutes plagiarism, it is their responsibility to clarify the matter by conferring with the instructor. Faculty members must report in writing cases of cheating, plagiarism or forgery to their department chair and their academic dean.*

#### **ADA Policy Statement:**

*Students with documented physical, learning, psychological and other disabilities are entitled to receive reasonable accommodations. If you need classroom or testing accommodations, please contact the Disability Resource Center (Student Union Building, Room 205, 257-3020). The DRC will provide forms verifying the need for accommodation. As soon as the instructor receives the form, you will be provided with the appropriate accommodations. Students are encouraged to request accommodations as close to the beginning of the semester as possible.*