VLSI System Design
(Graduate Level)

Course Description

The next-generation electronic system will have billions of transistors on a chip. To design such a complex system, designers need to understand system design issues to cope with this daunting task. This course introduces fundamental design concepts that are used to facilitate design and analysis of billion-transistor systems. The course emphasizes the balance between theory and hand-on practices. Upon completion of the course, you shall have adequate background for designing a moderate-size system. In this course, you will learn 1) VLSI system design flow; 2) major EDA tools; 3) writing moderate-size hardware description language; 4) digital processor design techniques. The course is outlined as follows:

- VLSI System Design Methodology
- Digital Design with Verilog
- Synthesis of Digital Logic
- Design of Digital Processors

Pre-requisite Courses:

- Digital logic or equivalent course (must)
- Computer organization (must)
- Self-motivation in learning CAD tools and Verilog HDL

Instructor: Lihyih Chiou, Ph.D.
Contact info: Email: lihyih@mail.ncku.edu.tw
Phone: (06) 2757575 #62447
Web: http://lpvlsi.ee.ncku.edu.tw/~lphplab/index.html
Course Website: http://moodle.ncku.edu.tw

Required Reading Materials:
Lecture Notes/Tutorial Notes: available on course website
References:


Lab tutorials:

Date: September 20/ September 27, 2011

Contents:

- Unix and Lab Environment
- Verilog Simulator, SpringSoft Debussy
- Synopsys Design Vision, Cadence SoC Encounter/IC Compiler

Exams and Projects:

<table>
<thead>
<tr>
<th>Exam/Project</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm exam</td>
<td>Thursday, November 08, 2012</td>
</tr>
<tr>
<td>Project proposal</td>
<td>Thursday, November 15, 2012</td>
</tr>
<tr>
<td>Project demo</td>
<td>Thursday, January 22, 2013</td>
</tr>
<tr>
<td>Project final Presentation</td>
<td>Thursday, January 24, 2013</td>
</tr>
</tbody>
</table>

- Examinations could be closed-book or open-book. NO calculator is allowed.
- There will be no make-up exams (in very special circumstances, written excuse and official proofs are required for make-up exams).

Homework Assignments

4 – 6 homework assignments will be given for the semester. Due day will be

NO FOOD AND DRINK IN THE LABORATORY
specified in the problem sheet.

- NO late submission will be accepted
- To get credit for your homework assignments, your submissions must be done professionally and seriously. Your official name, course number and homework number must be visibly shown in each assignment.
- All submission will be done electronically through the course website before the specified time. If you fail to do so, your assignment is considered OVERDUE and gets NO credit. An extra paper copy needs to be delivered in class.

**Grading Policy**

The tentative weights of the homework assignments and the exams are listed as below and they are subject to minor change.

- Participation 5~10%
- Homework assignments 25~30%
- Midterm exam/quizzes 15~20%
- Final project report/presentation 40~45%

**Course Policy**

- Encourage you to discuss assigned problems with peers
- Must complete his/her assignment independently or as specified
- Any person/team who is found to be dishonesty in homework assignments, examines/quizzes, or the project, the involved person(s) will receive an “0” on the evaluated instrument (*paper, exam, project, homework, etc.*)

**Notes:**

- All announcements will be put on the course website from time to time.
- All broadcast emails to you will send through *moodle* (course website) and only to your email account in NCKU, i.e., *nxxxxx@mail.ncku.edu.tw*.
- Please send questions to TA via *vsd2012@lpvlsi.ee.ncku.edu.tw*.
- Any other notes will be described during the class session.