EC413 – Computer Organization
Spring 2016
M W 10am-noon in EPC 209

Staff Information
Instructor:
Tali Moreshet, PHO 528 Email: talim@bu.edu (with EC413 in the subject line)
Office hours: M 12:30-1:30, Th 2-4, and by appointment

Teaching Assistants:
Ethan (Chen) Yang (GTA), cyang90@bu.edu
Ben Synder (GTA), jbsnyder@bu.edu
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Marcia Louis (grader), marcia93@bu.edu

Tentative TA lab hours, in PHO305/307: M7-8, T6-8, W6-8, Th6-8, F2:30-8.

Discussion Sections: Mondays 1-2, 5-6, or 6-7pm in PHO307
The discussion sections are run by the TFs and serves two purposes: a pre-lab and/or an extension of the lectures. Attendance is not required, but is strongly recommended.

Course Description
EC413 is an introduction to the fundamentals and design of computer systems. The starting points are your basic knowledge of logic design and high-level language programming. The ending points will be your ability to create a working computer from logic gates, to program that computer in assembly language, and to be able to evaluate design options. Topics include computer instruction sets, assembly language programming, logic design of arithmetic operations, design of sequential logic with registers and buses, CPU design (data path, control, integrating datapath and control, pipelining), performance evaluation, memory devices, memory systems (including caching and virtual memory), and I/O. In parallel there is a lab where the focus is on in-depth understanding of selected comp org topics including, HDL design using Verilog, and system design methods.
The prerequisites are EC311, including familiarity with Xilinx ISE CAD tools, and high-level language programming, preferably in EC327.

Textbook and Readings
• Additional readings will be posted.

Announcements, course material, readings, updated schedule, and other useful links will be posted on Blackboard (http://blackboard.bu.edu).

Labs
Our laboratory space is in PHO305/PHO307 (Linux machines with Windows VMs), although you can also use the eng-grid.bu.edu for running Linux applications. If you have registered for
this class sufficiently early, your BU ID should get you access to PHO305/PHO307; if not, please submit your request through Zaius (http://www.bu.edu/dbin/eng/zaius/).

Grades
All grades will be curved according to the class median. Thus, it is your relative score (compared to the rest of the class) that really matters, rather than your objective score.

Evaluation
Grading:

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<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Exams</td>
<td>50%</td>
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<tr>
<td>Homework</td>
<td>10%</td>
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<tr>
<td>Labs</td>
<td>20-25%</td>
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<tr>
<td>Final Project</td>
<td>15-20%</td>
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<tr>
<td>Quizzes</td>
<td>0-5%</td>
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Exams: There will be two midterms, during class time (tentative March 2 and April 13), and a final. Exams will be closed book/notes with only one letter-size two-sided, hand-written sheet of notes allowed. Also, no calculators are allowed.

Homework: Homework assignments will be posted on the Blackboard website. Homeworks are due at the beginning of class, and must be turned in online on Blackboard. Late homework will be penalized 20% for being up to one day late (starting from the beginning of the class when it is due) and will not be accepted thereafter. Doing the homework will prepare you for the exams!

Labs and project: The labs are assigned about a week before they are due and it is your responsibility to get them done on time, generally late Friday afternoons. Please note that the amount of time any particular lab takes can vary by an order of magnitude (from a few hours to a few days). The greatest determinants of duration are how well prepared you are before you start coding and how well you understand the tools.

Lab grading: A large part of each lab is the demo. Because there are many more students than TAs, you are urged to get the labs done early. For labs 3-6, 5% bonus for finishing by Thursday, 10% bonus for finishing earlier than that. On the other hand, there is a 10% penalty for being late one business day (usually the following Monday) and a severe penalty for being later than that.

Quizzes: There may be a few very short and relatively easy quizzes. Their purpose is to ensure that everybody keeps up. Quizzes are closed book and notes.

Attendance: Attendance is essential in this class. Much of what we cover in this course will be found nowhere else.

Note: You are expected to do all the labs and most of the project and homeworks in order to pass the course.

Collaboration
We take cheating and plagiarism very seriously. Homeworks and labs are to be done individually. You are encouraged to work together to learn the material and to discuss approaches to solving homework problems. However, you must come up with and write up the solutions on your own. Projects will be done in groups. You may not collaborate in any way on exams or quizzes. Failure to meet any of the above conditions will be considered cheating in this class.