EC413 – Computer Organization
Spring 2020
M W 10:10am-11:55 in CAS 226

Instructor:
Tali Moreshet, PHO 528  Email: talim@bu.edu (with EC413 in the subject line)
Office hours: T 1-3pm, Th 1:30-2:30, and by appointment

Teaching Assistants:
Zihao Yuan (GTA), yuan1z@bu.edu
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TA lab hours, in PHO305/307: Tues-Thur. 6:30-8:30pm, Fri. 3-7pm.

Discussion Sections: Monday 1:25-2:15pm, 4:40-5:30pm, or 6:30-7:20pm, in PHO305.
The discussion sections are run by the TAs and serve 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 end
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, and memory systems
(including caching and virtual memory). 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 Verilog, and high-level language
programming, preferably in EC327.

Textbook
• Patterson & Hennessy, Computer Organization & Design: The Hardware/Software

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

Labs
Our laboratory space is in PHO305/PHO307 (Linux machines), although you can also use the
eng-grid.bu.edu for running Linux applications. Request card access to PHO305/PHO307
through Zaius (http://www.bu.edu/dbin/eng/zaius/).
Evaluation
Grading:
- Exams: 60%
- Homework: 5-10%
- Labs: 30%
- Quizzes: 0-5%

Exams: There will be two midterms, during class time, tentative March 4 and April 13, and a final. Exams will be closed book/notes, no calculators, with only one letter-size two-sided, hand-written sheet of notes allowed.

Homework: Homework assignments will be posted on the Blackboard website. Homeworks are to be submitted on Blackboard as a single pdf file before the specified deadline (typically, in one week by 8pm). Late homework will be penalized 20% for being up to one day late and will not be accepted thereafter. Doing the homework will prepare you for the exams!

Labs: The labs are assigned about a week before they are due and it is your responsibility to get them done on time, generally 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).

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 with demos, 5% bonus for finishing by Wednesday, 3% bonus for finishing by Thursday. 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 will be regular in-class short quizzes on Blackboard. Their purpose is to encourage attendance and participation. Quizzes are open book and notes. You may take the quizzes on Blackboard on your laptop, tablet, or smartphone, by installing the Blackboard app. No makeup is available for quizzes, even with a legitimate excuse. To accommodate, the lowest quiz grade will be dropped.

Attendance: Attendance is essential in this class. Some of what we cover in this course will be found nowhere else. You are also strongly encouraged to actively participate.

Course Policies
- **Exam/Home/Lab Grade discussion:** Grade discussion/corrections should be done within one week after the graded exam or homework is distributed. No grade changes will be made after one week.
- **Academic integrity:**
  - 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. Copying the solution and/or answer from another student or source is considered cheating.
  - Clearly reference any sources you used in your work: books, Internet, and your collaborators!
  - You may not collaborate in any way on exams.
  - **Boston University’s academic code of conduct** will be strictly applied.
- **Copyright:** All class material is copyrighted, and may not be shared publicly online by any means. This includes your own solutions to assignments.