

EC605 – Computer Engineering Fundamentals

Fall 2021

M W 10:10-11:55am in PHO 307

Instructor: Tali Moreshet, PHO 528

Email: talim@bu.edu (with EC605 in the subject line)

Office hours: TBD

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Lab hours: M-Th 6:30-8:30pm, (PHO305/PHO307)

Course Description

This is an introductory course to computer engineering, focusing on the hardware/software interface, and presenting a bottom-up view of a computer system. Topics include logic design: binary arithmetic, combinational and sequential logic. Computer organization: assembly language programming, CPU design, and memory systems. Introduction to compilers, operating systems, and computer networks.

Prerequisites

This course is intended for graduate students with little or no background in computer engineering. It is expected that students have some programming background, and so EC602 (or EC327) is a co-requisite.

Textbooks

- Computer Organization and Design, The Hardware/Software Interface, ARM Edition, David Patterson and John Hennessy, Morgan Kaufmann, 2016. (Required)
- Digital Design, 6th (or earlier) edition, Morris Mano and Michael Ciletti, Pearson. (Optional)
- Starter's Guide to Verilog 2001, Michael Ciletti, Pearson. (Optional)
- Computer Systems, A Programmer's Perspective, third edition, Randal Bryant and David O'Hallaron, Pearson, 2016. (Optional)
- Computer Networks, (5th or 6th edition), Andrew Tanenbaum and David Wetherall, Prentice Hall. (Optional)

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

Outcomes

1. Understand the fundamentals of binary arithmetic.
2. Understand what components are available for logic design.
3. Design combinational digital logic systems given specifications.
4. Design sequential digital logic systems given specifications.
5. Understand the basics of assembly language programming.
6. Understand concepts of CPU and memory design.
7. Gain knowledge of some basic concepts of compilers.
8. Gain basic understanding of operating systems, including Unix and file systems.
9. Understand basic concepts of computer networks, with an emphasis on TCP/IP.

Evaluation

Grading: Exams: 50%
Labs: 35%
Homework: 10%
Class attendance: 5%

- Exams:** There will be one midterm exam, during class time (tentative Oct. 13), and a cumulative final exam. Exams are closed book, but you are allowed to bring one sheet of hand-written notes (to be turned in with your exam). No calculators are allowed.
- Labs:** Lab assignments will be posted on the Blackboard website. The labs need to be submitted on Blackboard and demoed to a TA. Some of the labs are to be completed in groups of two, others are individual.
- Homework:** Homework assignments will be posted on the Blackboard website. Homeworks are to be submitted on Blackboard, in pdf format, before the specified deadline.
- Attendance:** You are expected to attend class, actively participate, and keep up with the material. You are also encouraged to attend office and lab hours as needed.

Course Policies:

- **Attendance:** You should attend class. Much of the material (and perspective) in this course will be found nowhere else. Part of your grade is dependent on class participation.
- **Homework and labs:** The homework and labs must be the result of your individual work. You may discuss the contents and general approach to a problem with your classmates but not the detailed solution. You are expected to formulate your approach and write the solutions by yourself. Clearly reference any sources you used in your work: books, Internet, and your collaborators! Copying the solution and/or answer from another student or source is considered cheating. Little to no credit will be given for late homework. For labs, you are allowed up to 2 days late submission total for the semester. No credit will be given for late labs after this. The demos should be done according to the specified schedule with no delay. You are encouraged to attend lab hours for help. (Request card access to the lab: www.bu.edu/dbin/eng/zaius.)
- **Exam/Homework/Lab Grade dispute:** 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.
- **Copyright:** All class material is copyrighted, and may not be shared publicly online by any means.

Expectations Regarding Safety: Masks are required and face coverings must be worn over the mouth and nose at all times when in public spaces on campus, including classrooms. Students should be prepared to show proof that they are compliant with health attestations and testing in order to attend class. See official BU COVID policies: <http://www.bu.edu/dos/policies/lifebook/covid-19-policies-for-students/>

Inclusion: I consider this classroom to be a place where you will be treated with respect, and I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability – and other visible and nonvisible differences. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class.

Accommodations for Students with Documented Disabilities: If you believe you might have a disability that requires accommodations, requests for accommodations must be made in a timely fashion to Disability & Access Services, 25 Buick St, Suite 300, Boston, MA 02215; 617-353-3658 (Voice/TTY). See established policies and procedures: <http://www.bu.edu/disability/accommodations/>