

Instructor: Prof. Eshed Ohn-Bar

Email ehonbar@bu.edu

Office Location PHO532

Office Hours Thursdays 11am-noon (starts on 1/23)

TA:

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Office Hours Mondays and Wednesdays 5pm-7pm at PHO305/307.

** Check Blackboard for most up-to-date schedule.*

Lecture Schedule: Tuesday and Thursday, 9am-10:45am

Location: PHO307

Labs: Friday, 10:10am-11am (starts on 1/31)

Location: PHO 307

Course Description:

The growing popularity of modern embedded systems calls for a new generation of electrical and computer engineers who can easily cross the boundary between hardware and software. The course is designed to help develop such engineers by introducing students to a balanced, integrated view of software and hardware in designing embedded computer systems. The lectures will survey a broad array of subjects including system specification languages, embedded processors, memory architecture, communication architecture, real-time operating systems, scheduling, energy efficiency in hardware and software, hardware-software co-design techniques, debugging and verification techniques, and embedded systems security. The concepts will be reinforced with homework and project assignments that involve system design, modeling and validation. The assignments will involve C/Linux programming, ARM/Linux-based evaluation boards, and optionally other microprocessor or FPGA-based boards.

Prerequisites:

Experience in C/C++ programming and Linux

EC413, Computer Organization or equivalent

*Prior C or C++ programming knowledge is a **hard requirement**. Please discuss with the instructor if you have any questions.

References:

There are no mandatory textbooks for this class, but we will be reading papers and chapters from books from time to time. Any required reading will be listed on Blackboard.

A few reference books for this course:

- Jonathan Cobert, Linux Device Drivers, Third Edition, O'Reilly, 2005. (*online version available for free*)

- Robert Love, Linux Kernel Development, Second Edition, Novell Press, 2005.
- Frank Vahid, Tony Givargis, Embedded System Design: A Unified Hardware/Software Introduction, John Wiley & sons, Inc. 2002.
- Christopher Hallinan, Embedded Linux Primer: A Practical Real-World Approach, Second Edition, Prentice Hall, 2010.
- Edward A. Lee and Sanjit A. Seshia, Introduction to Embedded Systems, A Cyber-Physical Systems Approach, <http://LeeSeshia.org>, ISBN 978-0-557-70857-4, 2011.

Grading:

Homework Assignments: 10%

Labs: 15%

Project: 25%

Participation: 10%

Exam: 40%

Assignments:

Homework and labs are typically assigned in class. Deadline is strictly enforced. **No late submissions will be accepted.**

Academic Honesty:

All students are responsible for reading Boston University's academic conduct policy. If you are unclear about any item related to academic honesty, you should immediately ask the professor or the TAs. Dishonesty in representing one's academic work is a serious ethical violation and will be reported according to university policy.

This course uses automated software for detecting similarity checking among assignment submissions. Make sure to avoid sharing or receiving code from anyone in class or from an external party. Most of the assignments in the course will be done individually. Collaboration rules for any team labs and the project will be highlighted. General rule of thumb: you may discuss ideas with classmates, but never code together or send/receive any code or other assignment material.

Course Website and Communication:

You are required to periodically check the course website on BU Blackboard (learn.bu.edu) and your e-mail. Blackboard will have the course schedule, slides, links to reading materials, assignments, and announcements. Blackboard will host the discussion board for the class. Questions regarding class materials and programming should be directed to the Blackboard.

When you email the instructor or the TAs, please put **"EC535" in the subject line** to ensure a timely response.

We will use GradeScope for assignment submissions.