EC 535 – Introduction to Embedded Systems – Spring 2021

Instructor: Prof. Ayse Coskun

Email	acoskun@bu.edu
Work Phone	617-358-3641
Office Location	Online
Office Hours	Tuesdays 1-2pm ***OR*** by appointment

TAs:

Anthony Byrne	abyrne19@bu.edu
Panat Taranat	ptaranat@bu.edu
Office Hours	*Check Blackboard for most up-to-date schedule.*

***** *TA will be holding the office hours online.*

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

Labs: Friday, 10:10am-11am
Location: in-person @ PHO 307 and online

*** Please see Blackboard for Zoom links for lectures, office hours, etc.*

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 breed such engineers by introducing students to a balanced, integrated view of software and hardware in designing electronic 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: 20%
Labs: 40% *(tentatively lab 5 will have higher weight)*
Participation: 15%
Exam: 25%

Assignments:
Homework and labs are typically assigned in class. Deadline is strictly enforced, and late submissions will be penalized according to the following policy:

- 20% fixed penalty for up to 48 hours late. Submissions that are delayed for more than 48 hours after the deadline are **not** 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 will be highlighted. General rule of thumb: you may discuss ideas with class mates, 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), Piazza, and your e-mail. Blackboard will have the course schedule, slides, links to reading materials, assignments, and announcements. Piazza will host the discussion board for the class. You encouraged to use the discussion board for your class-related questions.

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. Details will be provided later.