EC330 – Applied Algorithms and Data Structures for Engineers   Fall 2021

T Th 9:00-10:45am, PHO 203
Discussion: Fri 11:15-12:05, EPC 204, or 1:25-2:15, EPC 208

Instructor: Tali Moreshet, PHO 528   Email: talim@bu.edu (with EC330 in the subject line)
    Office hours: TBD

Graduate Teaching Assistant: Muzammil Hussain, muz@bu.edu
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    Office hours for TAs: M-F 6:30-8:30pm PHO 305/307

Course Description
A good understanding of algorithms is essential to most engineering tasks today. Correct implementations of algorithms have allowed the Internet to grow unbounded, computer games to function in real time, and databases to be accessed quickly (and incorrect implementations have done the opposite!). We will begin the course with a serious introduction to algorithmic analysis, followed by a treatment of simple data structures and sorting algorithms. We will continue with more sophisticated data structures and graph algorithms, and end with advanced data structures as time permits. Throughout the course we will discuss applications of the data structures and algorithms considered, and homework will focus on theory as well as C++ implementations. EC327 (and optionally MA193) are the prerequisites for this class.

Textbook
- Cormen, Leiserson, Rivest, and Stein, **Introduction to Algorithms** (3rd Edition), MIT press, 2009: This is the most complete reference for data structures and algorithms currently in use, and it is found on the bookshelves of many professional engineers.

Optional Reference Texts
- Mark Allen Weiss, Data Structures & Algorithm Analysis in C++, 4th Edition, Prentice Hall, 2014: This is an alternate text used by other universities for this class. It is not as comprehensive or deep as our textbook, but it is somewhat easier to understand and provides C++ code, not just pseudocode.
- Michael Goodrich, Roberto Tamassia, David Mount, Data Structures and Algorithms in C++, 2nd Edition, Wiley, 2011: This is another alternate text used by other universities for this class. It is not nearly as comprehensive as our textbook, but it is easier to understand.

Online References
- cppreference.com – C++ reference with lots of good syntax and library documentation.

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

Labs
Homework assignments will be completed in C++. You may use any development environment you wish, as long as it is fully compatible with C++ 17. You should make sure that your code compiles and runs on the lab computers, with the specified compiler. Our laboratory space is in PHO305/PHO307 (Linux machines), and you may connect remotely to the eng-grid.bu.edu for running Linux applications. Request card access to PHO305 & PHO307 through Zaius (http://www.bu.edu/dbin/eng/zaius/).

Grades
All grades will be curved according to the class average. 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.

Evaluation
Grading: Exams: 60%
                Homework: 35%
                Class participation: 5%
Exams: There will be a midterm, during class time, October 21, and a final. Both will take place in the computer lab. The policy on what you are allowed to bring to the exam will be announced.
Homework: Homework assignments will be posted on Blackboard/Gradescope. These are due on the specified due date, and must be turned in online, as specified. If your homework is not readable, it will not be graded.
Attendance: You are expected to attend class and discussion sections, actively participate, and keep up with the material. You are also encouraged to attend office and lab hours as needed.
Discussion sections: These are meant to provide extra depth to the course, including homework tips and review of some topics. You may attend either of the two sections.

Expectations Regarding Safety: Masks are required and 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 BU COVID policies: *http://www.bu.edu/dos/policies/lifebook/covid-19-policies-for-students/*

Collaboration and Copyright: We take cheating and plagiarism very seriously. You may use other textbooks and web sources, and up to ONE other classmate per homework, subject to the following strict conditions:
1. You must acknowledge all sources, including your collaborator, at the top of your work.
2. You must write all answers in your own words, only code may be shared with a collaborator.
3. **You may not submit ANY C++ code not written by you and your collaborator.**
4. **You may not collaborate in any way on exams and quizzes.**
Failure to meet any of the above conditions will be considered cheating in this class.
5. **All class material is copyrighted, and may not be shared publicly online by any means.** This includes your own solutions.

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/*