EC330 – Applied Algorithms and Data Structures for Engineers
Fall 2019
T Th 9:00-10:45am in PHO 203
Discussion: Fri 11:15-12:05, CAS 213 or 1:25-2:15, CAS 235

Staff Information
Instructor:
   Tali Moreshet, PHO 528   Email: talim@bu.edu (with EC330 in the subject line)
   Office hours: M 12:30-2:30pm, W 3-4pm, and by appointment

Graduate Teaching Assistant:
   Kacper Wardega, ktw@bu.edu

Lab assistants/Graders:
   Sadie Allen, sadiela@bu.edu, Benjamin Chan, chanben@bu.edu,
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   Office hours for TAs, M-F 6:30-8:30pm in PHO305/307

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, 2013: This is an alternate text used by other universities for this class. It is not nearly 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
- cplusplus.com – The C++ resources network 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 (e.g. Netbeans, Eclipse, XCode, Visual Studio), as long as it is fully compatible with C++ 11. You should make sure that your code compiles and runs on the lab computers, with the specified compiler. (You can get a copy of Visual Studio.NET here: http://tinyurl.com/BU-ENG-Dreamspark.) Our laboratory space is in PHO305/PHO307 (Linux machines), although you can also 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. Thus, it is your relative score (compared to the rest of the class) that really matters, rather than your objective score. 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: 30%
In-class and discussion section quizzes: 10%

Exams: There will be a midterm, during class time, October 22, and a final. The policy on what you are allowed to bring to the exam will be announced.

Homework: Homework assignments will be posted on Blackboard. These are due at the beginning of class, and must be turned in online on Blackboard, as a single file in pdf format or as specified. No late homework will be accepted. Exceptions will only be considered for legitimate excuses with written, dated documentation. If your homework is not readable, it will not be graded.

Quizzes: The purpose of the in-class quizzes is to ensure that you attend class and keep up with the material. No makeup is available for quizzes, even with a legitimate excuse. However, to account for this, the lowest quiz grade will be dropped.

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. Some of the discussions will also have a short graded quiz.

Collaboration and Copyright
We take cheating and plagiarism very seriously. You may use other textbooks, web sources, and/or 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 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 or 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.