

EE 360C Algorithms
Course Syllabus
Unique Section: 76105
Summer 2019

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Course Description: This course studies combinatorial algorithms. We will begin by reviewing discrete mathematics. We will then study measuring program performance using asymptotic notation. We will then focus on general algorithm design principles, such as greedy approaches, divide and conquer, and dynamic programming. Our last topic will be NP-completeness.

The principal focus of the lectures will be theoretical. In addition to the lectures and their associated homework assignments and quizzes, there will be a number of programming assignments, in which you will be required to implement algorithms. To help you in this regard, material on best programming practices, including tools, testing methodologies, documentation systems, tuning techniques, version control, debugging, build strategies, portability, etc., will be made available. You will be required to adhere to these practices in the programming projects, and questions based on these topics may be asked in the exams.

Prerequisites: This course is intended for undergraduate students who have taken at least EE312. You should be comfortable writing, compiling, and debugging programs of a moderate complexity (i.e., hundreds of lines of code). Course programming will be done in Java; lectures will not include instruction in any programming language, but preparation from EE312 should be sufficient for the course. Students concerned about programming capabilities are recommended to peruse the recommended Java text below (or any other good Java text or website).

Required Text: J. Kleinberg and E. Tardos. **Algorithm Design**. Addison Wesley, 2005.

Recommended Texts:

- T. H. Cormen, C. E. Leiserson, R. H. Rivest, and C. Stein. Introduction to Algorithms. The MIT Press, 2009 (Third Edition).
- B. Eckel. Thinking in Java. Prentice Hall, 2006 (Fourth Edition).

Assignments: Homework assignments will be given out weekly. They will not be collected. Instead, a quiz of great similarity to the homework will be given every week. The intention is that, if you have done the homework assignment, the quiz should be straightforward. After the quiz, solutions to the entire homework assignment will be posted on Canvas. For this reason, no late quizzes will be administered. While the homework assignments are not collected and graded, you should do them on time and on your own. This will be essential to mastering the course material. Programming assignments will be submitted electronically. **Late assignments will not be accepted.** In addition, each programming assignment will contain information about how to structure the solution to ensure that the test program will execute efficiently. Not following these instructions will result in a loss of some credit (specific to the assignment).

Evaluation and Grading: There will be regular quizzes and programming assignments. The programming assignments will be a total of 20% of your final grade, and the weekly quizzes will be 25% of your final grade. Your quiz average will be computed by dropping the two lowest quiz scores (e.g., if you miss a quiz, you will receive a 0, but you can drop that quiz; if you don't miss any quizzes, we will just drop the two lowest scores). **There will be no makeup quizzes.** Some quizzes may be done in groups or in a combination of groups and individually. These formats will be determined throughout the semester as we go. However, for every quiz, each individual student will receive a score; group quiz scores, if they are the lowest, can also be dropped.

Three exams will count for the other 50% of the course grade (each of the two in-class exams is 15% of your final grade, and the final exam is 20% of your final grade). The final 5% of your grade will be determined based on your participation in the class, including during in-class exercises, on Piazza, etc.

To summarize:

Category	% of Final Grade
Programming Assignments	20%
Weekly Quizzes	25%
Exams	50%
Class Participation	5%

Final Grades: Final grades will be assigned according to the following standard criteria:

Final Average	Letter Grade
90-100	A
80-89	B
70-79	C
60-69	D
0-59	F

Final class grades will be calculated to 2 decimal places and rounded to the nearest integer. 89.49 is a B. 89.50 is an A. The line has to be drawn somewhere, and no special allowances will be made for students whose final average falls near, but below the cutoff. There is a possibility of curves on the exam and quiz grades. There will not be a curve on programming assignments. Non-academic explanations for poor class performance will have no bearing on the assignment of grades. The instructors reserve the right to lower the letter grade cutoffs for final grades; such changes will be determined only after all assignments and exams have been graded.

Grade Disputes and Corrections: The grade you are given on an exam, a quiz, an assignment, or as your final grade, is not the starting point of a negotiation; it is your grade unless a concrete error has been made. Do not come to the instructors or TAs to ask for a better grade because you want one or you feel you deserve it. Come only if you can document a specific error in grading or in recording your scores. Errors can certainly be made in grading, especially when many students are involved. But keep in mind that errors can be made either in your favor or not. So, it is possible that if you ask to have a piece of work re-graded your grade will go down rather than up.

Remember that the most important characteristic of any grading scheme is that it be fair. Keep this in mind if you're thinking of asking, for example, for more partial credit points on a problem. The important thing is not the exact number of points that were taken off for each kind of mistake. The important thing is that that number was the same for everyone. So, it can't easily be changed once the grading is done and the exams or assignments have been returned.

If you are dissatisfied with a grade you receive, you must submit your complaint briefly in writing or by email, along with supporting evidence or arguments, **within one week** of the date that we first attempted to return the exam or assignment to you. Complaints about grades received after the one week deadline will be considered only if there are extraordinary circumstances for missing the deadline (e.g., student hospitalization). No new disputes will be accepted after 11:59 AM two days before the course grade sheets must be turned in.

Collaboration:

Written homework: You should try to solve the problems by yourself. We recommend that you start early and get help in office hours if needed. You may attend office hours for either instructor or any of the TAs. If you find it helpful to discuss the problems with other students, do it. Just make sure you're getting something out of a group study session. Since you're not turning in the assignments to be graded, you are only cheating yourself by copying the answers from somewhere else.

Programming assignments: These are to be done individually. Any programs that violate the class's academic honesty policy will receive a 0. Do not cheat. We will catch you. Circumventing our strategies for detecting cheating is (much) more difficult than the assignments themselves.

Academic Dishonesty: The University and the Department are committed to preserving the reputation of your UT degree. To guarantee that every degree means what it says it means, we must enforce a strict policy on academic honesty: Every piece of work that you turn in with your name on it must be yours. As an honest student, you are responsible for enforcing this policy in three ways:

1. You must not turn in work that is not yours, except as expressly permitted by the instructors. **Specifically, you are not allowed to copy someone else's program code.** This is plagiarism.
2. You must not enable someone else to turn in work that is not his or hers. Do not share your work with anyone else. Make sure that you adequately protect your files. Even after you have finished a class, do not share your work or published answers with students who come after you. They need to do their work on their own.
3. You must not allow someone to openly violate this policy because it diminishes your effort as well as that of your honest classmates.

Students who violate University rules on scholastic dishonesty in assignments or exams are subject to disciplinary penalties, including the possibility of a lowered or 0 grade on an assignment or exam, failure in the course, and/or dismissal from the University. Changing your exam answers after they have been graded, copying answers during exams, or plagiarizing the work of others will be considered academic dishonesty and will not be tolerated. Plagiarism detection software will be used on the programs submitted in this class. If cheating is discovered, a report will be made to the Dean of Students.

Course Webpage: Course materials (e.g., the syllabus, lecture notes, assignments, etc.) and grades will become available via postings on this course's Canvas web page as the semester progresses. These will be the main sources of current class information: (i) class announcements, (ii) the homework and programming assignments, (iii) model solutions to programming assignments and exams, and so on. Please check this page regularly; you are responsible for everything that is posted on Canvas.

Attendance: Attendance is expected. Whether you come to class or not, you are responsible for keeping up with what happens in class. If you miss a class (other than for illness or an emergency), it is not reasonable for you to expect us to repeat the material that was covered in the class that you missed just for you. This applies both to the content of the class as well as to announcements about class policies, events, deadlines, etc. Students can expect a lower letter grade if they miss too many lectures.

Use of Email: You cannot expect to get last-minute help on assignments by email. More generally, you cannot expect to get detailed answers to technical questions by email. Students are encouraged to use Piazza or to discuss important matters in person, typically during office hours. If you must send an email, spend extra time to ensure that you are both brief and clear. Please include your name in the "From:" line of the email message, not just your email address. Email is a valuable tool for communicating with the instructional team. But be sure to use it properly and follow the rules of good email etiquette (e.g., no flaming, spamming, etc.). Although it's easy for you to dash off an email question, it takes time to answer it. In general, you should not ask email questions to which you can find the answer somewhere else (e.g., class notes, web page).

Students Right and Responsibility:

- You have a right to a learning environment that supports mental and physical wellness.
- You have a right to respect.

- You have a right to be assessed and graded fairly.
- You have a right to freedom of opinion and expression.
- You have a right to privacy and confidentiality.
- You have a right to meaningful and equal participation, to self-organize groups to improve your learning environment.
- You have a right to learn in an environment that is welcoming to all people. No student shall be isolated, excluded or diminished in any way.

With these rights come responsibilities:

- You are responsible for taking care of yourself, managing your time, and communicating with the teaching team and with others if things start to feel out of control or overwhelming.
- You are responsible for acting in a way that is worthy of respect and always respectful of others.

Your experience with this course is directly related to the quality of the energy that you bring to it, and your energy shapes the quality of your peers' experiences.

- You are responsible for creating an inclusive environment and for speaking up when someone is excluded.
- You are responsible for holding yourself accountable to these standards, holding each other to these standards, and holding the teaching team accountable as well.

Classroom Behavior You have the right to learn in every class you attend. But you also have the responsibility to help ensure that every other student shares that right. Specifically:

1. Under normal circumstances, class will start on time and end on time.
2. Come to class on time. Do not leave early. These things are very disruptive. Recognize that the buses and the parking space situation are unpredictable elements and allow for that. If you must come late or leave early (for example because of a doctor's appointment), let the instructor know in advance.
3. Don't be disruptive during class. Don't chat with your neighbors or rustle a newspaper.
4. Don't allow your electronic devices to be disruptive. Turn off your cell phone, beeper, and watch alarm. You are welcome (and even encouraged to use your computer in class, e.g., to take notes, look at supporting material, etc.) Do not let your computer become a distraction for you or others near you (i.e., watching videos or chatting online during lecture can be very distracting to you, your classmates, and your instructor).
5. Don't leave your mess lying on the classroom floor when you leave—pick it up and throw it in a trash can.

Other Course Related Policies

Learning Disabilities If you have a learning disability that requires special attention, either during class or during an exam, please give the instructor of the section you are registered for a letter from the Dean of Students describing what needs to be done. You should do this during the first week of classes. (The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. For more information, contact the Office of the Dean of Students at 471-6259, 471-4641.)

Religious Holy Days A student who is absent from an examination or cannot meet an assignment deadline due to the observance of a religious holy day may take the examination on an alternate day, submit the assignment up to 24 hours late without penalty, or be excused from the examination or assignment, **ONLY** if proper notice of the planned absence has been given to the instructor at least fourteen days prior to the classes scheduled on dates the student will be absent. For religious holy days that fall within the first two weeks of the semester, notice should be given on the first day of the semester. A student who fails to complete missed work within the time allowed will be subject to the normal academic penalties.

Mental Health Counseling Counselors are available Monday-Friday 8am-5pm at the UT Counseling and Mental Health Center (CMHC) on the 5th floor of the Student Services Building (SSB) in person and by phone (512-471-3515). The 24/7 UT Crisis Line is 512-471-2255.

Safety Information If you have concerns about the safety or behavior of students, TAs, Professors, or others, call the Behavioral Concerns Advice Line at 512-232-5050. Your call can be anonymous.

Online Privacy Web-based, password-protected class sites are associated with all academic courses taught at The University. Syllabi, handouts, assignments and other resources are types of information that may be available within these sites. Site activities could include exchanging e-mail, engaging in class discussions and chats, and exchanging files. In addition, electronic class rosters will be a component of the sites. Students who do not want their names included in these electronic class rosters must restrict their directory information in the Office of the Registrar, Main Building, Room 1. For information on restricting directory information see: <http://www.utexas.edu/student/registrar/catalogs/gi06-07/app/appc09.html>

Further, the instructors own the course material. Sharing course material with anyone not explicitly associated with this course in this semester is a violation of the instructors' intellectual property rights. You may not share these course materials with other students and you may not share them on public websites designed for collecting such information.

Course Policies Caveat As departmental, college and UT policies change, we reserve the right to alter these course policies during the course of the semester.