

## EE 360C - ALGORITHMS

**Course Syllabus**

Section 17075

Fall 2014

PROFESSOR

Dr. Pedro Santacruz

Email: [pesantacruz@utexas.edu](mailto:pesantacruz@utexas.edu)

Office: UTA 0.138 (Office hours location TBA)

Office hours: TTh 2:00-3:30pm or by appointment

TIME AND LOCATION

Tuesday and Thursday 12:30pm - 2:00pm

Waggener Hall (WAG), Room 214

TEACHING ASSISTANTS

Himanshu Chauhan

Email: [himanshu@utexas.edu](mailto:himanshu@utexas.edu)

Office Hours: MW 10:30am - 12:00pm

Tomasz Karlbarczyk

Email: [tkalbar@utexas.edu](mailto:tkalbar@utexas.edu)

Office Hours: M 3:30pm - 5:00pm W 2:00pm - 3:30pm

Han Li

Email: [ecehli@utexas.edu](mailto:ecehli@utexas.edu)

Office Hours: TW 3:30pm - 5:00pm

Srinivasan Sivaramachandran

Email: [srinivasan@utexas.edu](mailto:srinivasan@utexas.edu)

Office Hours: TTh 11:00am - 12:30pm

COURSE DESCRIPTION

This course studies combinatorial algorithms. We will begin by reviewing discrete mathematics. We will then study measuring program performance using asymptotic notation. Following this, we will study fundamental data structures and their associated algorithms; specifically, we will cover lists, arrays, queues, stacks, hash tables, sets, binary trees, and graphs. We will then focus on general algorithm design principles, such as greedy approaches and dynamic programming. Our last topic will be matrix algorithms.

The principle focus of the lectures will be theoretical, in the style of the CLRS Introduction to Algorithms text listed below. In addition to the lectures and their associated homework assignments, 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).

## 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).

## 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, I will just drop the two lowest scores). There will be no makeup quizzes. Three exams will count for the other 50% (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 in-class exercises. 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 see me 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's 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.

## FINAL GRADES

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

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

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. Nonacademic explanations for poor class performance will have no bearing on the assignment of grades.

### 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 blackboard. 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).

### COLLABORATION

- *Written homework:* you should try to solve the problems by yourself. I recommend that you start early and get help in office hours if needed. 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.
- *Programming assignments:* these are to be done individually. You may discuss the problem and general concepts with other students, but there should be no sharing of code. You may not submit code other than that which you write yourself or is provided with the assignment. This restriction specifically includes downloading code from the Internet. If any code you submit is in violation of this policy, you will receive no credit for the entire assignment.

Plagiarism and other forms of cheating will be dealt with severely.

### COURSE WEBSITE

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) the daily class announcements, (ii) the homework and programming assignments, (iii) model solutions to programming assignments and exams, and so on. Please check this page regularly.

### 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 me 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.

### GRADE DISPUTES AND CORRECTIONS

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, to me within one week of the date that I first attempted to return the exam or assignment results 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 11:59AM two days before the course grade sheets must be turned in.

### 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 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 me. 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).

### OTHER COURSE RELATED POLICIES

#### 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 me. **Specifically, you are not allowed to copy someone elses 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 all your files. Even after you have finished a class, do not share your work or published answers with the 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 may be used on the programs submitted in this class. If cheating is discovered, a report will be made to the Dean of Students recommending a course grade of 'F' for all involved in the incident.

#### LEARNING DISABILITIES

If you have a learning disability that requires special attention, either during class or during an exam, please give me 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 HOLIDAYS

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.

### CLASSROOM BEHAVIOR

You have the right to learn in every class you attend. But you also have the responsibility to help assure 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 the newspaper.
4. Don't allow your electronic devices to be disruptive. Turn off your cell phone, beeper, and watch alarm.
5. Don't leave your mess lying on the classroom floor when you leave; pick it up and throw it in a trash can.

### 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>

### COURSE POLICIES CAVEAT

As departmental, college and UT policies change, I reserve the right to alter the effected course policies stated herein during the course of the semester.