

CS 361 Algorithms and Data Structures

Syllabus – Fall 2016

Course Description

This course is an introduction to the design and analysis of algorithms for fundamental problems that arise in computer science. Students will learn about techniques such as greedy algorithms, divide-and-conquer, and dynamic programming along with more advanced topics such as graph algorithms and NP-completeness. Students will also learn how to analyze the efficiency of an algorithm using asymptotic analysis, and proof techniques for proving correctness. In addition to algorithms, this course covers more advanced data structures such as heaps and balanced trees.

Algorithms sits at the intersection of computer science and mathematics. As such, students can expect to spend time reading and examining mathematical proofs as well as writing their own proofs. At the end of this course, students should be able to articulate what the study of algorithms entails as well as design and analyze an appropriately efficient algorithm for a given problem.

Course Details

Instructor: Professor Chambers (alchambers@pugetsound.edu, Thompson 405)

Office Hours: MW 2:00pm – 3:30pm, Thurs 1:15pm – 2:45pm (or by appointment)

Course Time and Place: MWF 1:00 – 1:50pm in Thompson 381

Course webpage: <http://mathcs.pugetsound.edu/~alchambers/cs361>

Textbook: Jon Kleinberg, and Eva Tardos. *Algorithm Design*. 1st Edition. (Required)

Course Breakdown

Grading: Grades in the course are based on four components:

50%	Homework Assignments
15%	Midterm
15%	Final
20%	Friday Quizzes

Your work in this course will fall into several major areas:

Readings: Each class will have an accompanying reading assignment taken from the textbook. It is expected that you complete the reading before the corresponding class period. If you can't complete the reading before class, at least skim through it. The readings for each class will be posted in advance on the course webpage.

Homework Assignments: For the most part, homework will be assigned on a weekly basis. Most homework assignments will be written problems but two will have a programming component (all programming will be done in pairs). It is assumed that you are proficient at programming in Java. Assignments are due at the beginning of the class period. Late assignments will be penalized by $3^n\%$ for $n \leq 4$ where n is the

number of days the assignment is submitted late.

Friday Quizzes: There will be regular quizzes during the first 5 minutes of every Friday class. This is a great way for me to know what topics I should cover again and can also help you understand what topics you need to study more. Friday quizzes cannot be made up but your two lowest scores will be dropped.

Exams: There will be a midterm and a final exam in this class. The final exam is scheduled for Wednesday December 14, 2016 from noon-2pm. The midterm is *tentatively* scheduled for the week before Fall break. Details will be given closer to the exam dates.

Class Policies

- Please do not bring your laptops to class. Class periods are quite short and we need to make the most of every minute. If you have an accommodation in which you require a laptop, please let me know.
- For most class periods, I will use the white board. There are no posted powerpoint slides or lecture notes. If you miss class, please ask a fellow student if you can copy their class notes.
- Please prepare yourself to be in class and attentive for the full 50 minutes. Students getting up and leaving in the middle of class are a distraction both to the other students who are trying to learn and to me as I endeavor to use those 50 minutes effectively. In particular, this means you should fill your water bottles and use the restroom before coming to class. If you do need to leave class, you do not need to ask permission – quietly get up and go.
- Please indicate on each homework assignment with whom you worked.
- Attendance is mandatory.

Academic Accommodations

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Peggy Perno, Director of the Office of Student Accessibility and Accommodations, Howarth 105, pperno@pugetsound.edu, 253.879.3395. She will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Academic Honesty

Students are encouraged to discuss general ideas and approaches to the homework problems. However, when you write up the final solution to a problem, you should not look at anything but your own notes and your own scratch work. In particular,

- you should not look at someone else's write up or solutions posted on the internet
- answers should not be written on the board or passed around on a sheet of paper
- you should not take a picture of anything written on the board or a sheet of paper

In general, you should thoroughly understand any solution you submit. As such, I reserve the right to ask a student to re-solve a problem. *Please indicate on each homework assignment with whom (if anyone) you worked.*

All programming in this course will be pair programming. Any code submitted must represent the work of you and your partner only. Accordingly, you should never read or copy another student's code, exchange computer files, share your code, use code from the internet or past students, or in general hand in work done by someone else under your own name(s).

Failure to abide by these rules is considered plagiarism. The first offense typically results in failure in the course. Please read the University of Puget Sound's Academic Integrity policy (<http://www.pugetsound.edu/student-life/personal-safety/student-handbook/academic-handbook/academic-integrity/>) for further information.

Please do not put us, yourself, or anyone else in this unpleasant situation!