

CS 2420-001 ALGORITHMS AND DATA STRUCTURES

Spring Semester, 2016

SYLLABUS

Class Meets: 9:30—10:20 a.m., MWF, 406 Old Main

Instructor: Dr. Haitao Wang

Office: 402F Old Main

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Office Hours: 10:20—11:20 a.m. MWF, or by appointment

Teaching Assistant: Ms. Chong Li

Office: 422 Old Main

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Office Hours: 1:00—2:00 p.m. Friday, or by appointment

Prerequisites: CS 1720 or 1410 C- or better, and be familiar with C++ programming

Textbook (not required but recommended):

Mark Allen Weiss, *Data Structures and Algorithm Analysis in C++*, 3rd or 4th Edition.

A reference book: T.H. Cormen, C.E. Leiserson, R.L. Rivest, and C. Stein, *Introduction to Algorithms*, 3rd Edition, the MIT Press, Cambridge Massachusetts, 2009.

Topics to be Covered (subject to change): algorithm analysis techniques, asymptotic notation, recursions; data structures including linked lists, stacks, queues, trees, binary search trees, AVL trees, hash tables, heaps, disjoint-sets, etc; sorting algorithms including insertion sort, merge sort, quick sort, bucket sort, etc; graph algorithms including graph representations, graph traversals, topological sort, shortest paths, Dijkstra's algorithm, minimum spanning trees, etc.

Course objectives:

1. Learning factual knowledge about algorithms and data structures (terminology, methods).
2. Learning fundamental principles, theories, techniques in algorithms and data structures.
3. Develop programming skills in implementing standard data structures and algorithms to solve computational problems.

Tutors: Tutors are available in Old Main 419.

Course Work and Grading:

Homework (8-10, including both written and programming assignments): 50%

Mid-term: 20% (in class, Friday, March 4)

Final: 30% (9:30–11:20 a.m., Monday, May 2)

Note: February 1 (5:00 pm) is the last day to drop classes without notation on transcripts.

Homework Guidelines

Every student is required to abide by the principles and procedures set forth by the University in the **Code of Conduct**. In addition, we have the following guidelines for doing homework assignments in this course.

1. In general, no late homework will be accepted.
2. Although discussions of homework problems are allowed (including discussions with tutors), everyone should do his/her own work for the assignments.
3. The following are specifically for programming assignments.
 - All programming assignments must be written in C++.
 - You may use any computer system you desire.
 - Each program must be your own work (this includes not allowing a tutor to write your programs).
 - Please avoid using the STL (standard template library) unless the assignment explicitly states you can.
 - You are not allowed to copy any code from anywhere other than the textbooks and lecture notes unless the assignment explicitly states you can.
 - All programming assignments are to be turned in on Canvas.
 - There will be specific instructions for each individual homework problem.
4. The following are specifically for written assignments.
 - Everyone should do his/her own work for the assignments.
 - Discussions of homework problems are allowed only if all parties involved do not know the answers.
 - If during the discussion of a problem among a group of people, the solution for that problem is found, then the names of the people in the group must be listed in the submitted papers together with the answer for that problem.
 - If you already have the solution for a problem, then you should not give out ideas (such as the right approach or method) for that problem to other students. But you can help another person by giving “negative information”. For example, you may say that “your solution is not correct, because here is a counterexample”.
 - Before the assignments are submitted, no one (including those who already have the answers) should read another’s written solutions.

Students with Disabilities

Students with ADA-documented physical, sensory, emotional or medical impairments may be eligible for reasonable accommodations. Veterans may also be eligible for services. All accommodations are coordinated through the Disability Resource Center (DRC) in Room 101 of the University Inn, (435)797-2444 voice, (435)797-0740 TTY, or toll free at 1-800-259-2966. Please contact the DRC as early in the semester as possible. Alternate format materials (Braille, large print or digital) are available with advance notice.

Cheating Statement

Academic Dishonesty: This course adheres to the cheating policy for courses in the Department of Computer Science posted on the bulletin board outside the CS office on the 4th floor of Old Main and posted online at <http://cs.usu.edu/htm/cheating-policy/>.