

CS 3353: Data Structures and Algorithm Analysis I

Term Fall 2020

Meetings: Wednesday: 4.30-7.10 pm, NCB 250

Contact Information

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TA Information

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General Course Information

Pre-requisites, Co-requisites: CS 2133, CS 3653

Course Description:

Storage, structures, data and information structures, list processing, trees and tree processing, graphs and graph processing, searching, and sorting.

Required Text:

Cormen, Leiserson, Rivest, and Stein. *Introduction to Algorithms*, ISBN: 978 0 262 03384 8, 3/E, MIT Press, 2009.

Course Objectives:

Upon the successful completion of the course, the students will be able to:

- understand basic data structures and abstract data types including stacks, queues, lists, sets, maps and graphs.
- use recursion as a powerful problem solving technique in design and development of data structures and understand when it is not appropriate to use.
- gain an appreciation of the variety, theoretical nature, and practical uses of data structures.
- analyze the efficiency of data structures and select the most appropriate data structure for applications.
- build data structures and use them as building blocks to form more complex and advanced data structures in a hierarchical manner

Assignments & Academic Calendar

Week #	Day/ Date	Material to be Covered	Text
1	Aug 19	The Role of Algorithms in Computing, Insertion sort	Chap 1 Chap 2
2	Aug 26	Asymptotic notation Divide and Conquer	Chap 3 Chap 4
3	Sept 2	Sorting: Heap sort Sorting: Quick sort	Chap 6 Chap 7
4	Sept 9	Sorting in Linear time Data Structures: - Stacks and queues - Linked lists	Chap 8 Chap 10
5	Sept 16	Data Structures: - Stacks and queues - Linked lists	Chap 10
6	Sept 23	Test 1	
7	Sept 30	Hash tables	Chap 11
8	Oct 7	Binary Search Trees	Chap 12: 12.1-12.3
9	Oct 14	Red-black trees: - Insertion, Deletion, Quiz	Chap 13: 13.3
10	Oct 21	Dynamic Programming -knapsack problem	Chap 15
11	Oct 28	Greedy Algorithms, Elementary graph algorithms	Chap 16, Chap 22
12	Nov 4	Test 2	
13	Nov 11	Minimum Spanning Trees: Kruskals algorithm, Prim's algorithm	Chap 23
14	Nov 18	Shortest paths: Dijkstra's algorithm	Chap 24
15	Nov 25	Thanksgiving	
16	Dec 2	Shortest paths: Dijkstra's algorithm	Chap 24
	Dec 9	Final Exam	

Exams

There will be two tests, one Quiz and a Final exam.

Test 1: Wed, Sept 23, 2020

Quiz : Wed, Oct 14, 2020

Test 2: Wed, Nov 4, 2020

Final Exam: Wed, Dec 9, 2020

	The grade will be determined as described below.		
Grading (credit) Criteria	Test 1:		15%
	Test 2:		20%
	Quiz:		5%
	Final Exam:		20%
	Assignments[8]:		40%

	<p>Grades are assigned according to the following scale:</p> <p>[>=90%] A [80-89%] B [70-79%] C [60-69%] D [0-59%] F</p>
Make-up Exams	Make-up exams are only given to those students who coordinate the missing of an exam prior to the originally scheduled exam date and time.
Extra Credit	
Late Work	Assignments are due online on the dates given. If a student submits an assignment after the due date without having made arrangements with the instructor, a minimum of 15 points (based on an assignment grading scale of 100 points) or 15 percent of the total points will be deducted for each day, or part thereof, that the assignment is late.
Class Attendance	Class attendance will be documented.

OSU Academic Integrity Policy:

OSU is committed to maintaining the highest standards of integrity and ethical conduct. This level of ethical behavior and integrity will be maintained in this course. Participating in a behavior that violates academic integrity (e.g., unauthorized collaboration, plagiarism, multiple submissions, cheating on examinations, fabricating information, helping another person cheat, unauthorized advance access to examinations, altering or destroying the work of others, and altering academic records) will result in an official academic sanction. Violations may subject you to disciplinary action including the following: receiving a failing grade on an assignment, examination or course, receiving a notation of a violation of academic integrity on your transcript, and being suspended from the University. You have the right to appeal the charge. Go to <http://academicintegrity.okstate.edu/> for a video on OSU's academic integrity policy and additional information.