Readings

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Readings refer to chapters and/or sections of the course textbook:

Buy at Amazon Cormen, Thomas, Charles Leiserson, Ronald Rivest, and Clifford Stein. *Introduction to Algorithms*. 3rd ed. MIT Press, 2009. ISBN: 9780262033848.

LEC #	TOPICS	READINGS
Unit 1: Introduction		
1	Algorithmic thinking, peak finding	1, 3, D.1
2	Models of computation, Python cost model, document distance	1, 3, Python Cost Model
Unit 2: Sorting and Trees		
3	Insertion sort, merge sort	1.2, 2.1–2.3, 4.3–4.6
4	Heaps and heap sort	6.1–6.4
5	Binary search trees, BST sort	10.4, 12.1–12.3, Binary Search Trees
6	AVL trees, AVL sort	13.2, 14
7	Counting sort, radix sort, lower bounds for sorting and searching	8.1–8.3
Unit 3: Hashing		
8	Hashing with chaining	11.1–11.3
9	Table doubling, Karp-Rabin	17
10	Open addressing, cryptographic hashing	11.4
	Quiz 1	
Unit 4: Numerics		
11	Integer arithmetic, Karatsuba multiplication	
12	Square roots, Newton's method	
Unit 5: Graphs		
13	Breadth-first search (BFS)	22.1–22.2, B.4
14	Depth-first search (DFS), topological sorting	22.3–22.4
Unit 6: Shortest Paths		
15	Single-source shortest paths problem	24.0, 24.5
16	Dijkstra	24.3
17	Bellman-Ford	24.1–24.2
18	Speeding up Dijkstra	
	Quiz 2	
Unit 7: Dynamic Programming		
19	Memoization, subproblems, guessing, bottom-up; Fibonacci, shortest paths	15.1, 15.3
20	Parent pointers; text justification, perfect-information blackjack	15.3, Problem 15–4, Blackjack rules
21	String subproblems, psuedopolynomial time; parenthesization, edit distance, knapsack	15.1, 15.2, 15.4
22	Two kinds of guessing; piano/guitar fingering, Tetris training, Super Mario Bros.	

Unit 8: Advanced Topics		
23	Computational complexity	34.1–34.3
24	Algorithms research topics	