Introduction to Algorithms September 4, 2002
Massachusetts Institute of Technology 6.046J/18.410J
Professors Erik Demaine and Shafi Goldwasser Handout 2

Course Calendar

September

Wed	4	**Lecture 1** Administrivia; Introduction: design and analysis of algorithms, insertion sort, mergesort *Reading:* Chapters 1–2.	
Fri	6	**Recitation 1** Correctness of algorithms	PS 1 out
Mon	9	**Lecture 2** Asymptotic notation. Recurrences: substitution, iteration, master method *Reading:* Chapters 3–4, excluding §4.4	
Wed	11	**Lecture 3** Divide and conquer: Strassen's algorithm, integer multiplication, polynomial multiplication *Reading:* §28.2 and §30.1	
Fri	13	**Recitation 2** Recurrences, sloppiness (Akra-Bazzi) *Reading:* Akra-Bazzi handout	
Mon	16	**Lecture 4** Quicksort, randomized algorithms *Reading:* §5.1–5.3, Chapter 7	PS 1 due PS 2 out
Wed	18	**Lecture 5** Linear-time sorting, lower bounds, counting sort, radix sort *Reading:* §8.1–§8.3	
Fri	20	**Recitation 3** Sorting: Heapsort, dynamic sets, priority queues *Reading:* Chapter 6	
Mon	23	**STUDENT HOLIDAY — NO CLASSES**	
Wed	25	**Lecture 6** Order statistics, median *Reading:* Chapter 9	PS 2 due PS 3 out
Fri	27	**Recitation 4** Applications of median, bucket sort *Reading:* §8.4	
Mon	30	**Lecture 7** Hashing, universal hashing *Reading:* §11.1–§11.3	

October

Wed	2	**Lecture 8** Hash functions, perfect hashing *Reading:* §11.5	
Fri	4	**Recitation 5** Quiz 1 review	PS 3 due
Mon	7	**Quiz 1** in class	Quiz 1
Wed	9	**Lecture 9** Relation of BST's to quicksort; analysis of random BST *Reading:* §12.4	PS 4 out
Fri	11	**Recitation 6** Binary search trees, tree walks *Reading:* §12.1–§12.3	
Mon	14	**COLUMBUS DAY — VACATION**	
Wed	16	**Lecture 10** 2-3 trees, B-trees *Reading:* §18.1–18.2	
Fri	18	**Recitation 7** Red-black trees, rotations, insertions, deletions *Reading:* Chapter 13	
Mon	21	**Lecture 11** Skip lists *Reading:* Possible handout	PS 4 due PS 5 out
Wed	23	**Lecture 12** Augmenting data structures, interval trees *Reading:* Chapter 14	
Fri	25	**Recitation 8** Examples of augmentation *Reading:* Chapter 14	
Mon	28	**Lecture 13** Computational geometry, range queries *Reading:* §33.1–33.2	
Wed	30	**Lecture 14** van Emde Boas, priority queues *Reading:* van Emde Boas handout	PS 5 due PS 6 out

November

Fri	1	**Recitation 9** Convex hulls *Reading:* §33.3	
Mon	4	**Lecture 15** Dynamic programming, longest common subsequence, optimal BST *Reading:* Chapter 15	
Wed	6	**Lecture 16** Greedy algorithms, minimum spanning trees *Reading:* §16.1–16.3 and Chapter 23	
Fri	8	**Recitation 10** Examples of greedy algorithms and dynamic programming	
Mon	11	**VETERANS DAY — HOLIDAY**	
Wed	13	**Lecture 17** Fast Fourier transforms *Reading:* §30.1–30.2	PS 6 due
Fri	15	**Recitation 11** Quiz 2 review	
Mon	18	**Quiz 2** in class	
Wed	20	**Lecture 18** Amortized algorithms, table doubling, potential method *Reading:* Chapter 17	PS 7 out
Fri	22	**Recitation 12** Competitive analysis, self-organizing lists *Reading:* possible Sleator-Tarjan handout	
Mon	25	**Lecture 19** Shortest paths, Dijkstra's algorithm, breadth-first search *Reading:* §22.1, §22.2; pp. 580–587, §24.3	
Wed	27	**Lecture 20** Shortest paths, Bellman-Ford, shortest paths in DAGs, difference constraints *Reading:* §24.1, §24.2, §24.4, §24.5	PS 7 due
Fri	29	**THANKSGIVING VACATION — NO CLASSES**	

December

Mon	2	**Lecture 21** All-pairs shortest paths, dynamic programming, Floyd-Warshall, Johnson's algorithm *Reading:* Chapter 25	PS 8 out
Wed	4	**Lecture 22** Network flow, max-flow min-cut theorem, Ford-Fulkerson *Reading:* §26.1–26.2	
Fri	6	**Recitation 13** Matchmaking *Reading:* §26.3	PS 8 due PS 9 out (optional)
Mon	9	**Lecture 23** NP-completeness, polynomial-time reductions *Reading:* §34.1–34.2	
Wed	11	**Lecture 24** Approximation algorithms; discussion of follow-on courses *Reading:* §34.3–34.5	PS 9 solns out