

LEC #	TOPICS	SCRIBE NOTES	INSTRUCTOR NOTES
15	Linear Programming (cont.) Strong Duality	Duality <a href="#">(PDF)</a> (Courtesy of Jay-Kumar Sundararajan.)	
16	Linear Programming (cont.) Complementary Slackness Algorithms: Simplex, Ellipsoid	Duality <a href="#">(PDF)</a> (Courtesy of Jay-Kumar Sundararajan.)	
17	Linear Programming (cont.) Algorithms: Interior Point		
18	Approximation Algorithms NP-hard problems		<a href="#">(PDF)</a>
19	4/3-Approximation for TSP		
20	Relaxations Directed TSP		
21	Randomized Rounding Chernoff Bound Fixed Parameter Tractability Kernelization		<a href="#">(PDF)</a>
22	Online Algorithms (Ski Rental, Load Balancing, Paging)	Lower Bounds for Competitive Ratios of Randomized Online Algorithms <a href="#">(PDF)</a> (Courtesy of Chun-Chieh Lin.)	<a href="#">(PDF)</a>
23	Randomized Online Algorithms (Adversaries, Fiat's Marking Algorithm, Potential Functions, Yao's Minimax Principle)	Lower Bounds for Competitive Ratios of Randomized Online Algorithms <a href="#">(PDF)</a> (Courtesy of Chun-Chieh Lin.)	
24	K-Server Problem Double-Coverage Algorithm Computational Geometry Introduction (Orthogonal Range Search)		
25	Sweep Algorithms (Convex Hull, Segment Intersection, Voronoi Diagrams)	Sweep Line <a href="#">(PDF)</a> (Courtesy of Matt Rasmussen.)	<a href="#">(PDF)</a>
26	Sweep Algorithms (Voronoi Diagrams) Randomized Incremental Constructions Backwards Analysis Linear Programming in Fixed Dimension		
27	(Optional Material) External Memory Algorithms		<a href="#">(PDF)</a>
28	(Optional Material) Cache Oblivious Algorithms: Matrix Multiplication, Linked Lists, Median		
29	(Optional Material) Cache Oblivious Algorithms: Search Streaming Model		
29	(Optional Material) Parallel Algorithms		<a href="#">(PDF)</a>

Lecture notes from the 2004 version of this course.

LEC #	TOPICS	SCRIBE NOTES
1	Course Introduction Fibonacci Heaps	<a href="#">(PDF)</a> (Courtesy of David Andersen, Ioana Dumitriu, John Dunagan, and Akshay Patil.)
2	Persistent Data Structures Suffix Trees	<a href="#">(PDF 1)</a> (Courtesy of Sommer Gentry and Eddie Kohler.) <a href="#">(PDF 2)</a> (Courtesy of Jiawen Chen.)
3	Suffix Trees (cont.)	<a href="#">(PDF)</a>
4	Treaps	
	Splay Trees	<a href="#">(PDF)</a> (Courtesy of Naveen Sunkavally.)
5	Hashing: 2-Universal, Perfect Hashing Fingerprinting	

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6	Fingerprinting (cont.) Max Flows	( <a href="#">PDF 1</a> ) (Courtesy of Jiawen Chen.) ( <a href="#">PDF 2</a> ) (Courtesy of Alexandr Andoni.)
7	Max Flows (cont.)	
8	Max Flows (cont.)	
9	Max Flows (Max Flow of Min Cost)	
	Dynamic Trees Preflow-push Algorithm	
10	Min Cost Flow Algorithms Linear Programming	( <a href="#">PDF 1</a> ) (Courtesy of Brian Dean and John Jannotti.)
11	Linear Programming (cont.) Farkas Lemma Duality	( <a href="#">PDF</a> ) (Courtesy of Vinod Vaikuntanathan.)
	Goldberg-Tarjan Min-cost Flow	( <a href="#">PDF</a> ) (Courtesy of Mohammad Hajiaghayi and Vahab Mirrokni.)
12	Linear Programming: More Duality (Weak and Strong Duality) Complementary Slackness Conditions	
13	Linear Programming: Complementary Slackness Conditions (Same Scribes as Above)	
14	LP: Interior Points Algorithm Approximation Algorithms: Constant, Relative Approximation	( <a href="#">PDF</a> ) (Courtesy of Jason Eisenberg.)
15	Approximation Algorithm: PAS, FPAS, Rounding, Enumeration	
16	Approximation Algorithm: Rounding, Relaxation	( <a href="#">PDF</a> ) (Courtesy of Sachin Katti.)
17	Approximation Algorithm: LP Relaxation, Randomized Rounding	( <a href="#">PDF</a> ) (Courtesy of Shannon McDonald.)
18	Fixed Parameter Tractability	( <a href="#">PDF</a> ) (Courtesy of Shannon McDonald.)
19	Fixed Parameter Tractability - Treewidth Online Algorithms	
20	Online Algorithms (cont.): Paging, Randomization, Potential Functions	
21	Randomized Online Algorithms (Adversarial Models, Marking Algorithm)	
22	Lower Bounds for Randomized Online Algorithms Geometry: Range Search	( <a href="#">PDF</a> ) (Courtesy of Nick Harvey.)
23	Convex Hulls Voronoi Diagrams	
24	Voronoi Diagrams (cont.) Randomized Incremental Construction: Binary Space Partition	

LEC #	TOPICS	SCRIBE NOTES
26	External Memory Algorithms	
27	Cache-oblivious Algorithms	

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