Syllabus

Handout
CSCI 256: Spring, 2006
3 February

Algorithm Design and Analysis

Instructor:	Professor Stacia Wyman
Office:	TCL 305, 597-4711 (top floor of Chemistry)
Office Hours:	M 1–3 pm, F 1–2 pm, & by appt.
Email:	`stacia@cs.williams.edu`
Course Web Page:	`http://www.cs.williams.edu/~stacia/courses/cs256/`
Meeting Times:	MWF 11-11:50am, Location: TCL 206
TA:	Alex Constantin
TA Office Hours:	TBD

Textbook

Algorithm Design: Foundations, Analysis, and Internet Examples by Goodrich and Tamassia.

The book is available at Water Street books or your favorite online bookseller (i.e. Half.com). You are responsible for knowing the material in the book from the assigned readings. There will also be a copy of the textbook on the bookshelf in the Computer Science common room. Please do not remove it from this area.

Evaluation

There will be weekly homework assignments (which may occasionally involve programming) which will count as 45% of your grade. Late assignments are not accepted without a good reason, but one or two of the lowest homework scores will be dropped.

There will be three take home exams during the semester. Two exams will each count as 20% of your final grade, and one will count as 15%. I will take your lowest-scoring exam as the 15% exam.

Honor Code

The take-home exams will be open-book. You may use your text, your own class notes and homework solutions, as well as the provided solutions to homework assignments. *N*o other sources may be used. You may *n*ot consult other students, TA's, the web, or other books.

You may find it helpful to work together on homework problems. This is acceptable (and even encouraged), but you must write up your own solutions. If you work on a problem with other students, please indicate those students with whom you have worked at the top of your assignment. Working together without indicating so or turning in someone else's write-up of a problem solution is a violation of the Honor Code. Homework assignments should be typed with drawn in pictures unless you have extremely neat handwriting.

Schedule

Date	Topic	Reading	Exams
34 Feb	Introduction	Sec. 1.1,1.3	
6 Feb	Proof Techniques	Sec. 1.2,1.4	
8 Feb	Analysis Techniques		
10 Feb	Analysis Techniques		
13 Feb	Advanced Data Structures: Heaps	Sec. 2.4, 2.1–2.3	
15 Feb	Advanced Data Structures: Union Find		
17 Feb	No Class: Winter Carnival		
20 Feb	Binary Search Trees	Sec. 2.3,3.1	
22 Feb	Splay Trees, 2-4 Trees	Sec. 1.1.5,3.3,3.4	
24 Feb	Amortized Analysis		
27 Feb	Techniques: Greedy Algorithms	Sec. 5.1.2,9.3	
1 Mar	Techniques: Brute Force	Sec. 9.1.1,9.1.2,12.4.2	Exam 1 out
3 Mar	Techniques: Divide & Conquer		
6 Mar	Skip Lists		Exam 1 due
8 Mar	Skip Lists	Sec. 5.3	
10 Mar	Dynamic Programming		
13 Mar	More Techniques: Dynamic Programming	Sec. 9.4	
15 Mar	DP: Fibanacci, LCS	Sec. 9.4	
17 Mar	Matrix Chain Multiplication	Sec. 5.3,6.1,6.2	
20 Mar	Spring Break		
22 Mar	Spring Break		
24 Mar	Spring Break		
27 Mar	Spring Break		
29 Mar	Spring Break		
31 Mar	Spring Break		
3 Apr	Graph Algorithms: BFS	Sec. 6.2,6.3	
5 Apr	Graph Algorithms: DFS		
7 Apr	Directed Graphs: Topological Sorting	Sec. 6.4.4	
10 Apr	Weighted Graphs: Dijkstra's Algorithm	Sec. 7.1	Exam 2 out
12 Apr	Max Flow	Sec. 8.1	
14 Apr	Bipartite Graphs	Sec. 8.2	Exam 2 due
17 Apr	Pattern Matching: Boyer Moore, KMP	Sec. 9.1.3,9.1.4	
19 Apr	Pattern Matching: Tries	Sec. 9.2	
21 Apr	Pattern Matching: Suffix Trees	Sec. 9.2.3	
24 Apr	Computational Geometry: Line Segments	Sec. 12.5.2	
26 Apr	Computational Geometry: Convex Hulls	Sec. 12.5.5	
28 Apr	Computational Geometry: Motion Planning		
1 May	NP Completeness	Sec. 13.1	
3 May	NP Completeness	Sec. 13.2.2	
5 May	NP Completeness		
8 May	Approximation Algorithms		Exam 3 out
10 May	Advanced Topics		
12 May	Wrap up and Review		Exam 3 due