

CS 3343/3341 Syllabus – Fall 2006

Analysis of Algorithms

According to the Undergraduate Catalog, this course discusses the analysis of the performance of algorithms and programming techniques and data structures used in the writing of effective algorithms. 4 hours credit. Prerequisite: CS 2413/2411 (Systems Programming), 3233/3321 (Discrete Mathematics) and Math 2213 (Calculus III). The objectives of this course are to learn and apply techniques for the design and analysis of algorithms.

Instructor and Teaching Assistant

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Office Hours: Monday 4-5pm, Wednesday 4-5pm.

Book

Required: A. Levitin, *Introduction to the Design and Analysis of Algorithms*, Second Edition, Addison Wesley, 2007. (must be some sort of time warp)

Grading

Homework 30%, 3 Projects 15%, 2 Midterms 30%, Final Exam 25%.

Two homeworks will be dropped; late homeworks will not be accepted. Late projects will be accepted with a 50% penalty. Make-up exams are permitted if you have a reasonable excuse, you inform me in a timely fashion, and you document the excuse.

Homework and Projects

Short homeworks will be assigned each week (except for midterm weeks) and will be normally be due within one week. Two homeworks will be dropped. Late homeworks will not be accepted. Recitation sessions will mostly be devoted to solving the homework problems.

The three projects will be empirical analysis and comparison of algorithms (see Section 2.6). Each project will involve a program and a report. The program will run, test, and gather statistics (timing, number of basic operations) on the algorithms. The report will describe the results and conclusions, including scatterplots and models of the statistics.

All homeworks and projects will be handed in and graded using WebCT.

Attendance and Participation

Regular class and recitation attendance per se is not required, but you should note that the the homeworks, projects, and exam material will be covered in detail in the lectures and recitations.

Tentative Schedule

<u>Day</u>	<u>Topic</u>	<u>Assignment</u>
Aug. 24	Class Policy, Introduction	§1
29	Fundamentals	§2
31	Fundamentals	
Sept. 5	Fundamentals	
7	Fundamentals	
12	Brute Force	§3
14	Brute Force	
19	Divide and Conquer	§4
21	Divide and Conquer	
26	Midterm Review	Project 1 Due
28	Midterm 1	
Oct. 3	Decrease and Conquer	§5
5	Decrease and Conquer	
10	Transform and Conquer	§6
12	Transform and Conquer	
17	Space and Time Tradeoffs	§7
19	Space and Time Tradeoffs	
24	Dynamic Programming	§8
26	Dynamic Programming	
31	Midterm Review	Project 2 Due
Nov. 2	Midterm 2	
7	Greedy Algorithms	§9
9	Greedy Algorithms	
14	Iterative Improvement	§10
16	Iterative Improvement	
21	Limitations of Algorithms	§11
28	Limitations of Algorithms	
30	Final Review	Project 3 Due
Dec. 8	Final Exam: Friday, 10:30am to 1:15pm	