Syllabus
CPSC 658 Randomized Algorithms
Fall 2011

MWF 11:30am-12:20pm, ZACH 105B

Course Description and Prerequisites

The course gives an introduction to randomized algorithms; randomization allows to design efficient algorithms, which are of elegant simplicity; selected tools and techniques from probability theory and game theory are reviewed, with a view towards algorithmic applications; the main focus is a thorough discussion of the main paradigms, techniques, and tools in the design and analysis of randomized algorithms; a detailed analysis of numerous algorithms illustrates the abstract concepts and techniques.

Learning Outcomes or Course Objectives

At the end of this course you should

- know the fundamentals of discrete probability theory;
- know the basic randomized algorithms discussed in this course;
- be able to analyze selected randomized algorithms;
- know the theory of Markov chains;
- are knowledgeable about selected randomized data structures;
- be familiar with the probabilistic method.

Instructor Information

Instructor	Dr. Andreas Klappenecker
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Office hours	MT 2:00-2:50pm or by appointment
Course homepage	http://faculty.cs.tamu.edu/klappi/csce658-f11/index.html

Textbook

The **required textbook** for this course is

> M. Mitzenmacher, E. Upfal: *Probability and Computing – Randomized Algorithms and Probabilistic Analysis*, Cambridge University Press, 2005.

Another recommended book is R. Motwani, P. Raghavan: *Randomized Algorithms*, Cambridge University Press, 1995. A useful reference for probability theory is the book *Probability and Random Processes* by G. Grimmett and D. Stirzaker, 3rd edition, Oxford University Press, 2001. For selected topics, we will use the book *The Probabilistic Method* by N. Alon and J. Spencer, 2nd edition, Wiley-Interscience, 2000. Lecture notes will be provided to supplement these materials.

Prerequisites.

Graduate standing or approval by instructor.

Grading.

The course has one midterm exam, a final project, and homework assignments. The grade will be calculated as follows:

Midterm exam 25%, **Project** 30%, **Assignments** 45%

The dates of all major examinations will be announced in class. The course grades will be assigned according to the scale **A** for 90%-100% of total points, **B** for 80%–89%, **C** for 70–79%, **D** for 60%–69%, and **F** otherwise. A curve might be applied if the class average is lower than expected.

Americans with Disabilities Act (ADA) Policy Statement

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