CS 583 - Analysis of Algorithms

Spring 2017

Course Description

This course focuses on a thorough examination of several well-known techniques used for the design and analysis of algorithms. Topics include analyzing sequential and parallel algorithmic strategies such as greedy methods, divide and conquer strategies, dynamic programming, search and traversal techniques, and approximation algorithms; and introduction into the theory of NP-completeness.

Instructor

Dmitri Kaznachey, Ph.D.
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Office hours: by appointment

Graduate Teaching Assistant

TBD

Class

Innovation Hall, Room 134
Wednesday, 7:20 PM - 10:00 PM (see exceptions below)

Prerequisites

- CS 310 - Data Structures
- CS 330 - Formal Methods and Models
- MATH 125 - Discrete Mathematics I

Text Book

- Introduction to Algorithms by T. H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein, 3rd Edition (2009)

Grading

- 3 Homeworks (10 points each) - 30%
- Midterm (30 points) - 30%
- Final (40 points) - 40%
- Bonus points:
    - Class participation - 5
    - Homeworks - 3
    - Midterm exam - 3
    - Final exam - 4

100+ points: A+; [90, 100): A; [85, 90): B+; [80, 85): B; [75, 80): B-; [70, 75): C; [0, 70): F

Tentative Schedule

Date	Topic	Test
Jan 25	Introduction; chapter 1	
Feb 1	Asymptotic notation; chapters 2.2, 3.1, 3.2	HW1 assigned
Feb 8	Divide and conquer strategy; chapter 4	HW1 due
Feb 15	Probabilistic analysis and randomized algorithms; chapter 5, appendix C	
Feb 22	Quicksort	HW2 assigned
Mar 1	Order statistics; chapters 6, 7, 8	HW2 due
Mar 8	Midterm Exam	Midterm
Mar 15	Spring Break - NO CLASS	
Mar 22	Order statistics; chapters 9, 10, 11, appendix B	
Mar 29	Dynamic programming; chapter 15	HW3 assigned
Apr 5	Greedy algorithms; chapter 16	
Apr 12	Amortized analysis; chapter 17	HW3 due
Apr 19	Shortest paths; chapters 22, 23, 24, 25	
Apr 26	Maximum flow; chapter 26	

May 3	Reading Day - NO CLASS (office hours)	
May 10	Final Exam - 7:30 PM	Final

Policies

Please note that all coursework should be done independently. Plagiarizing the homework and cheating on the exam will be penalized; see Honor Code at http://cs.gmu.edu/resources/honor-code.