CMPSC 465
Data Structures and Algorithms

Course Logistics
Last updated August 26, 2014
Kamesh Madduri
Welcome to the class!

• Lectures will be in 113 IST Building
• TR 6.30 – 7.45 PM
• Don’t use computers at the desk, actively take notes during class 😊

• Recitation sections on Mondays
• Five sections, Willard building
Your instructors: Kamesh Madduri

• **343E IST Building**

• **Office hours**
  • M TR 3 – 4 PM
  • By appointment
    (see my [office schedule](#), pick a time, and contact me)

• **Contact**: email via Angel, private message on [Piazza](#)

• About Kamesh: assistant professor in CSE; research interests: parallel algorithms, high-performance computing.
Your instructors: Piotr Berman

- 346H IST Building
- Office hours
  - TBD
- Contact: email via Angel
- About Piotr: associate professor in CSE; research interests: Computational Molecular Biology, Approximation Algorithms, Computational Complexity, Theory of Distributed Systems.
Class Teaching Assistants, Office hours

• Xin Chen
  • TR 2.30-3.30 PM, 338E IST Building
• Yu-San Lin
  • WF 1-2 PM, 338E IST Building
• Xianliang “Leon” Zhang
  • F 9-11 AM, 338E IST Building

• TAs will manage recitation sections on Mondays

• Contact: email via Angel, private message on Piazza
  • Copy instructors on all correspondence
Class online

• Web page  [http://www.cse.psu.edu/~madduri/teaching/CMPSC465](http://www.cse.psu.edu/~madduri/teaching/CMPSC465)
  • Syllabus pdf
  • Class schedule, any changes to syllabus

• Angel
  • Lecture slides, homeworks, homework drop boxes, online assessments, code, etc.
  • Announcements will be sent through Angel.

• Piazza
  • General questions about class topics covered, logistics
The class is full, but I’d like to join

• Stay on class watch list, try to join any section with an open seat.

• Please contact me this Friday (11-3 PM) or next Tuesday (Sep 2, 3-4 PM).
Textbook

• Introduction to Algorithms, 3rd edition
  • Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein
  • http://mitpress.mit.edu/books/introduction-algorithms

• Second edition also okay for this class, but note changes in pseudocode syntax.

• Lectures will be based on textbook material.
About the class

• Introductory data structures and algorithms class
• Required course for CMPSC and CMPEN undergrad students
• Graduate CSE students, class prepares you for Algorithms candidacy exam

• Prerequisites
  • CMPSC 122
  • CMPSC 360 or MATH 311W
Key Learning Outcomes

• Analysis of asymptotic behavior of recursive and non-recursive algorithms
• Describe algorithms using pseudocode
• Proving correctness of algorithms
• Determine running time expressions of algorithms
• Using and analyzing standard data structures: linked lists, stacks, queues, priority queues, set representations
• Algorithms that use common design principles, such as divide-and-conquer, greedy algorithms, dynamic programming
• Set operations, Sorting, Graph computations, ...
Topics to be covered

- Introduction
- Growth of functions
- Recurrences
- Divide-and-Conquer
- Dynamic Programming
- Midterm Exam 1 (Oct 2)
- Greedy Algorithms
Topics to be covered

• Elementary data structures
• Heaps
• Sorting algorithms
• Hash tables
• Binary Search Trees
• Midterm Exam 2 (Nov 11)
Topics to be covered

• Elementary Graph Algorithms
• Minimum Spanning Trees
• Single-source shortest paths
• NP-Completeness

Final Exam
Topics that we won’t cover

• Probabilistic analysis and Randomized algorithms
• Approximation algorithms
• Amortized analysis
• Advanced data structures
• Advanced graph algorithms
• Numerical methods
• Linear programming
• String algorithms
• Real-world algorithms
• ...
Evaluation

- Homeworks, 35%
- Online assessments, 10%
- Midterm exam 1, 17.5%
- Midterm exam 2, 17.5%
- Final exam, 20%
Homeworks

• Eight homeworks, top seven will be considered for final grade.

• Homeworks will be given out on Thursdays, due in a week.

• In-class submissions preferred (typed or neatly handwritten). Alternately, submit via Angel Drop box. Emailed and late submissions will not be accepted.

• See tentative homework schedule on Angel.

• See syllabus for collaboration policy.
Online Assessments

• Six (or more) assessments, top five will be considered for final grade.
• Assessments will also be given out (online) on Thursdays, due in a week.
• Best of three attempts for each assessment.
• No collaboration permitted.
Exams

• Midterm exams will be in-class (during class hours).
• Final exam will be comprehensive.
• No collaboration allowed.
Additional Resources

• Several Algorithms and Data Structure text books
• Prior offerings of CMPSC 465 at Penn State
  • Spring 2014, Spring 2013, Spring 2012
• Other schools
  • Stony Brook, Prof. Skiena’s lectures http://www3.cs.stonybrook.edu/~algorith/video-lectures/
• Coursera, Udacity
• ACM ICPC, TopCoder, Google code jam
Questions?