Analysis of Algorithms
Spring 2016
Course Information

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Brooklyn College

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Instructor — Amotz Bar-Noy

- **E-mail:** amotz@sci.brooklyn.cuny.edu.
- **Internet:** http://www.sci.brooklyn.cuny.edu/~amotz/bc-algorithms.html
- **Office Hours:** Tuesday 3:00pm–4:00pm, Room 2112a.
- **Class Hours:** Tuesday 6:05pm–8:00pm, Room 236NE.
Prerequisite Courses and Knowledge

- A course in data structure
  - Computer and Information Science 6006X [622X]
- A course in discrete structures.
  - 6004X [611X]
Textbooks

Main Textbook

- 2nd edition and even 1st edition are also good.
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**Other Books**
- “Algorithm Design,” Kleinberg and Tardos, Addison Wesley.
- “Algorithm Design,” Goodrich and Tamassia, Wiley.
- “Introduction to Algorithms a Creative Approach,” Manber, Addison-Wesley.
Online Resources

- **Lecture notes from MIT:**
  

- **Problems on Algorithms:**
  
  http://larc.unt.edu/ian/books/free/poa.pdf

- **Mathematics for Computer Science:**
  
  - http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-042j-mathematics-for-computer-science-fall-2010/
Tentative Syllabus

- Introduction; Mathematical Background; Analysis of Algorithms.
- Searching; Order Statistics; Sorting.
- Divide & Conquer; Greedy Algorithms; Dynamic Programming.
- Graphs; Graph Traversals; Minimum Spanning Trees.
- NP-Completeness.
Tentative Schedule

01. 02/02/2016 Mathematical Background
02. 02/16/2016 Analysis of Algorithms
03. 02/23/2016 Order Statistics
04. 03/01/2016 Sorting
05. 03/08/2016 Sorting Networks
06. 03/15/2016 **Midterm Exam**
07. 03/22/2016 Divide and Conquer
08. 03/29/2016 Greedy Algorithms
09. 04/05/2016 Dynamic Programming
10. 04/12/2016 Graphs
11. 04/19/2016 Graph Traversals
12. 05/03/2016 Minimum Spanning Trees
13. 05/10/2016 NP-Completeness
14. 05/17/2016 To Be Determined
15. 05/24/2016 **Final Exam**
Grading

Percentages

- This is only a guide, percentages and rules may change during the semester as needed.

- The final grade will be composed of the following 4 components:
  - \( \approx 40\% - 60\% \) final exam.
  - \( \approx 20\% - 30\% \) mid-term exam.
  - \( \approx 0\% - 20\% \) quizzes.
  - \( \approx 10\% - 10\% \) assignments.

General Formula

\[
\text{final}\% = 100 - \text{midterm}\% - \text{assignments}\% - \text{quizzes}\%
\]

Final grade dominates: if X's grade is less than final exam's grade, then X's grade becomes final exam's grade!
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General Formula

- final% = 100 - midterm% - assignments% - quizzes%
- Final grade dominates: if X’s grade is less than final exam’s grade, then X’s grade becomes final exam’s grade!
Quizzes

- There could be two types of quizzes:
  - At the beginning of the class to check what you learned in the previous week.
  - At the end of the class to check what you learned during the class.

- There might be no announcements regrading quizzes.

- The number of quizzes has not yet been determined.
Answering a question

- Answer a question in an exam, in a quiz, or in an assignment:
  - Only within the given space for the answer.
  - Using a readable text with normal size font.
  - You get 20% of the value if you leave the answer blank.
  - You get no points for a wrong answer.
Preparing Assignments

- Type the answers or use a *readable* hand writing.
- Do the assignments alone if you can.
- Get help if necessary.
- You **must** understand everything you write.
Reading and Practicing Assignment

- Refresh your algorithmic knowledge and mathematical foundations.
  - In the second edition read Chapters 1–4 (without 4.4) and Appendices A–D (without C.5). In the first edition read Chapters 1–5 (without 4.4).

- Practice by solving some or all of the problems in the books and online resources.
  - Watch online videos about “Mathematics for Computer Science.” [http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-042j-mathematics-for-computer-science-fall-2010/]
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