Analysis of Algorithms
Fall 2020
Course Information

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- E-mail: amotz@sci.brooklyn.cuny.edu
- Internet: http://www.sci.brooklyn.cuny.edu/~amotz/algorithms.html
- Office Hours: Tuesday 3:00pm–4:00pm
- Class Hours: Tuesday 6:05pm–8:10pm
Prerequisite Courses and Knowledge

- A course in Data Structure
- A course in Discrete Structures or Discrete Math
Main Textbook

- "Introduction to Algorithms (3rd edition)," Cormen, Leiserson, Rivest, and Stein, MIT press.
- 2nd edition and even 1st edition are also good.
Main Textbook

  - 2nd edition and even 1st edition are also good.

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

- Video Lectures for the main text book from MIT:

- YouTube Lectures for another course on algorithms from Stanford:
  https://www.youtube.com/playlist?list=PLXFMmlk03Dt7Q0xr1PIAriY5623cKiH7V

- Problems on Algorithms book by I. Parberry and W. Gasarch:

- Video lectures for Mathematics for Computer Science from MIT:
  https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-042j-mathematics-for-computer-science-fall-2010/video-lectures/
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.
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Grading

Percentages

- This is only a **guideline**, percentages and rules may change during the semester.

- The final grade will be composed of the following 5 components:
  - \( \approx 40\% - 60\% \) final exam.
  - \( \approx 20\% - 30\% \) mid-term exam.
  - \( \approx 0\% - 20\% \) quizzes.
  - \( \approx 10\% - 10\% \) assignments.
  - \( \approx 0\% - 20\% \) programming project.
Grading

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This is only a **guideline**, percentages and rules may change during the semester.

The final grade will be composed of the following 5 components:

- ≈ 40% – 60% final exam.
- ≈ 20% – 30% mid-term exam.
- ≈ 0% – 20% quizzes.
- ≈ 10% – 10% assignments.
- ≈ 0% – 20% programming project.

General Formula

final% = 100 - midterm% - assignments% - quizzes% - project%.

Final exam grade dominates: only grades that are greater than the final exam grade count!
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.
Refresh your algorithmic knowledge and mathematical foundations.


Practice by solving some or all of the problems in the books and online resources.

- Solve problems in Chapters 1–5 of the online book “Problems on Algorithms,” by Ian Parberry.
  

Watch online videos about “Mathematics for Computer Science.”

https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-042j-mathematics-for-computer-science-fall-2010/video-lectures/