

CS 340 - Analysis of Algorithms

Fall 2017

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TTH 11:25am - 12:45pm, Park 337

Textbook

Required: Algorithm Design by Jon Kleinberg and Eva Tardos

Class Time and Office Hours

- Class meets TTH 11:25am - 12:45pm in Park 337
- Lab meets T 12:55pm - 2:15pm in Park 232
- Office hours will be Thursdays 1pm - 2:45pm in Park 203, and by appointment.
- TAs:
 - Ziting Shen Mondays 6pm-8pm Park 231
 - Linyi Chen Tuesdays 5:30pm-7:30pm Linc L309
- Check the class website often for updates. Deadlines will also be listed there.

Prerequisites

All three of the following courses (or their equivalents at Haverford or Swarthmore) are required with a grade of 2.0 or better (or permission of the instructor).

1. CS 110
2. CS 206
3. CS 231

Schedule of Topics

This schedule is *tentative*. Homework is **due every Thursday in class**. If you miss class or do not hand in during class for any reason (your forgot to bring the papers), you must make sure that your papers reach the box outside my office by 2:15pm on the same Thursday. **Hard copies are required** - any assignments missing a hard copy by the 2:15pm deadline will not be accepted. Students should expect ***at least 10 hours of work each week***.

Week 1. Introduction

- Reading: Chapters 1 and 2
- Homework 1

Week 2. Basics of Algorithms Analysis, Graphs

- Reading: Chapters 2 and 3
- Homework 2

Week 3. Greedy Algorithms

- Project assigned

- Reading: Chapter 4
- Homework 3

Week 4. Greedy Algorithms and Divide and Conquer

- Reading: Chapters 4 and 5
- Homework 4

Week 5. Divide and Conquer

- Reading: Chapter 5
- Homework 5
- Project checkpoint 1

Week 6. Midterm

- Review
- Midterm in class

Week 7. Mid-semester break

Week 8. Dynamic Programming

- Reading: Chapter 6
- Homework 6 (due the following Thursday)

Week 9. Network Flow

- Reading: Chapter 7
- Homework 7
- Project checkpoint 2

Week 10. Intractability, Reductions, NP-Completeness

- Reading: Chapter 8.1 - 8.4
- Homework 8

Week 11. NP-Complete Problems

- Reading: Chapter 8.5 - 8.10
- Homework 9

Week 12. Approximation Algorithms

- Project presentations this week
- Reading: Chapter 11.1 - 11.5
- Homework 10

Week 13. Approximation Algorithms

- Reading: Chapter 11.6 - 11.8

- Homework 11

Week 14. Randomized Algorithms

- Reading: Chapter 13
- Homework 12

Week 15. Advanced Topics and/or Review

- Last lecture on 12/12

Week 16. Final exam week - the final exam will be self-scheduled through the registrar's office.

Total grade breakdown

Grades will be awarded based on the number of points earned and according to the percentage breakdowns shown. Students will not be graded on a curve.

Homework	25%
Group Project	15%
Midterm	25%
Final exam	35%

Late work policy

All extensions must be requested **at least 24 hours in advance** of the deadline. Extensions will be granted based on individual circumstances. Work handed in late without a previously granted extension may not be accepted.

Rules and Pet Peeves

- **Be on time.** This includes class, lab, office hours, and appointments.
- **Attend all classes and labs.**
- **Expect 24 hours before an email response** or longer on a weekend. I often respond MUCH faster than this, but you should NOT expect it. This means that waiting until the last minute to start your homeworks is a very bad idea.

Attendance and Participation

Attendance at, and active participation in, all class sessions is expected of all students. Participation will be taken into account in awarding of final grades for students who are "on the edge" between two grades. For example, a student with a B+/A- average and a strong attendance and participation record would receive an A-, while a student with a weak record would receive a B+.

Collaboration

It is your responsibility to understand and follow the collaboration policy in this class. The goal of the policy is to encourage collaboration while ensuring that you and your classmates really engage in earning how to solve the challenging problems you'll see in this course. If you are ever uncertain if collaboration or certain sources are allowed, you should ask the professor.

You are encouraged to discuss the lecture material and the labs and problems with other students, subject to the following restriction: the only "product" of your discussion should be your memory/understanding of it - you may not write up solutions together, or exchange written work or computer files. The group project is the only exception to this - in this case, these collaboration rules apply to students outside of your group and you may freely work closely with students within your group. Collaboration is not allowed on examinations or quizzes.

You should not use outside sources (the internet, other textbooks, students not in this class, etc.). Code should not be copied without permission from the author. If permission is given, code should be cited at the location it is used with a comment. If your solution is inspired by any outside resources (I understand that sometimes it is hard to not see things), you **MUST** cite.

Learning Accommodations

Students requesting accommodations in this course because of the impact of disability are encouraged to meet with me privately early in the semester with a verification letter. Students not yet approved to receive accommodations should also contact Deb Alder, Coordinator of Accessibility Services, at 610-526-7351 in Guild Hall, as soon as possible, to verify their eligibility for reasonable accommodations. Early contact will help avoid unnecessary inconvenience and delays.