CS 340 - Analysis of Algorithms
Fall 2016

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MW 12:45 - 2:15pm, Hilles 011

Textbook

Required: Algorithm Design by Jon Kleinberg and Eva Tardos

Class Time and Office Hours

- Class meets MW 12:45-2:15pm in Hilles 011.
- Lab meets M 2:15-3pm, M 3pm - 3:45pm, or W 2:15 - 3pm in Hilles 011.
- Office hours will be Wednesdays from 6:00 - 7:45pm in KINSC H110 and Wednesdays from 3 - 4pm in KINSC L305. See the Google Calendar for the up to date information. Office hours are also available by appointment.
- TAs: Kyu Chang and Kewei Qu. Office hours are Sundays from 8-10pm at Bryn Mawr and Tuesdays 8-10pm at Haverford in Hilles 110.
- Add the class Google Calendar to keep up to date with any scheduling changes. Deadlines will also be listed there.

Prerequisites

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

1. CS 105

2. CS 106

3. CS 231

Schedule of Topics

This schedule is *tentative*. Homework is **due at 2:00pm every Thursday to Sorelle's office (L305)** on the week following that in which it is listed. **Hard copies are required** - any assignments missing a hard copy by the 2:00pm deadline will not be accepted. Students should expect **at least 10 hours of work each week.** For the most up-to-date dates and deadlines see the CS 340 Google Calendar.

Week 1. Introduction, Basics of Algorithms Analysis
- Reading: Chapters 1 and 2
- Homework 1

Week 2. Graphs

- No class or lab on Monday (Labor day)
- Reading: Chapter 3
- Homework 2

Week 3. Greedy Algorithms

- Reading: Chapter 4
- Homework 3
- Project assigned (Wednesday)

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 (Monday)

Week 6. Midterm

- Review on Monday (Sorelle not in class - Rosh Hashanah)
- Midterm in class on Wednesday.

Week 7. Mid-semester break

Week 8. Dynamic Programming

- Reading: Chapter 6
- Homework 6 (due the following Thursday)
- Project checkpoint 2 (Wednesday)

Week 9. Network Flow

- Reading: Chapter 7
- Homework 7

Week 10. Intractability, Reductions, NP-Completeness

- Reading: Chapter 8.1 - 8.4
- Homework 8
- Project presentations this week

Week 11. NP-Complete Problems

- Reading: Chapter 8.5 - 8.10
- Homework 9

Week 12. Approximation Algorithms

- 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 (tradeoffs between query time and space, online algorithms, amortized analysis) and Review

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.
- **No computer use in class without approval.** Computers should only be used in class to take notes. This includes laptops, tablets, phones, etc..
- **Expect 24 hours before an email response** or longer on a weekend.
- **Read email at least once a day.** This will be the main method of communication outside of class hours.
- **Attend all classes and labs.**

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 Computer Science Department Collaboration Policy in this class. It is available at:
`https://www.haverford.edu/computer-science/resources/collaboration-policy`
The goal of the policy is to encourage collaboration while ensuring that you and your classmates engage in really learning how to solve the challenging problems you'll see in this course. No outside sources (the internet, other textbooks, students not in this class, etc.) are allowed in this course. If you are ever uncertain if collaboration or certain sources are allowed, you should ask the professor.

Learning Accommodations

Haverford College is committed to supporting the learning process for all students. Please contact me as soon as possible if you are having difficulties in the course. There are also many resources on campus available to you as a student, including the Office of Academic Resources (`https://www.haverford.edu/oar/`) and the Office of Access and Disability Services (`https://www.haverford.edu/access-and-disability-services/`). If you think you may need accommodations because of a disability, you should contact Access and Disability Services at `hc-ads@haverford.edu`. If you have already been approved to receive academic accommodations and would like to request accommodations in this course because of a disability, please meet with me privately at the beginning of the semester (ideally within the first two weeks) with your verification letter.