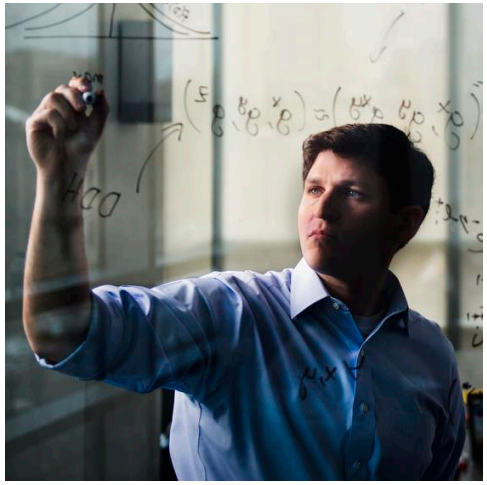
Me

Jonathan Ullman

- Feel free to call me Jon
- Research: Foundations of Trustworthy AI and Statistics

- Office: 177 Huntington 616
- Office Hours:
  - Tricky because I'm in 177
  - Will poll for a good time
  - Always available by appt



The TA Team

John Abascal

- Will help us part-time
- He has an adorable sausage dog

- Office: 177 Huntington 6th Floor

Algorithms

What is an algorithm?

> *An explicit, precise, unambiguous, mechanically-executable sequence of elementary instructions for solving a computational problem. -Jeff Erickson*

Algorithms

What is algorithms (the subfield of CS)?

> *The rigorous mathematical study of computational problems and the algorithms for solving them.*

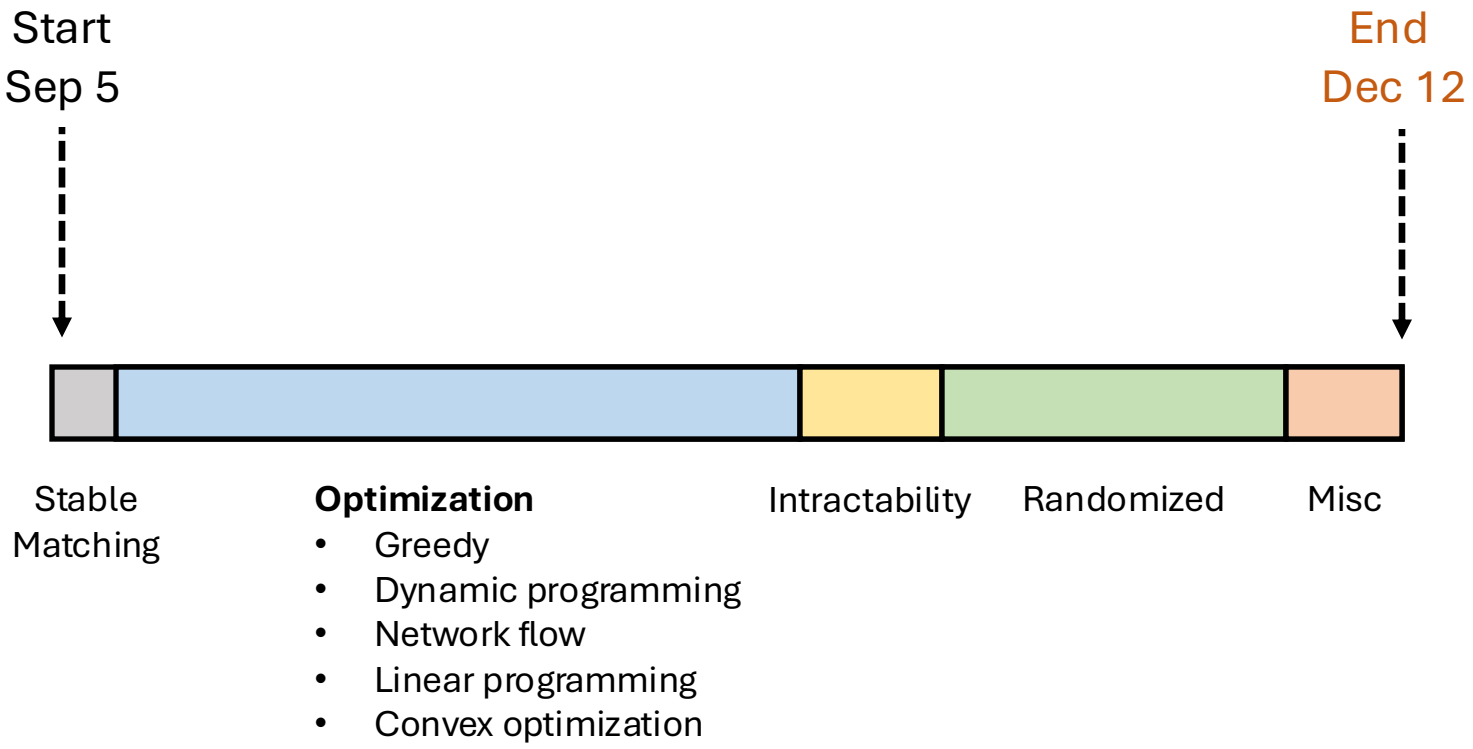
Algorithms

What is CS 7800: Advanced Algorithms?

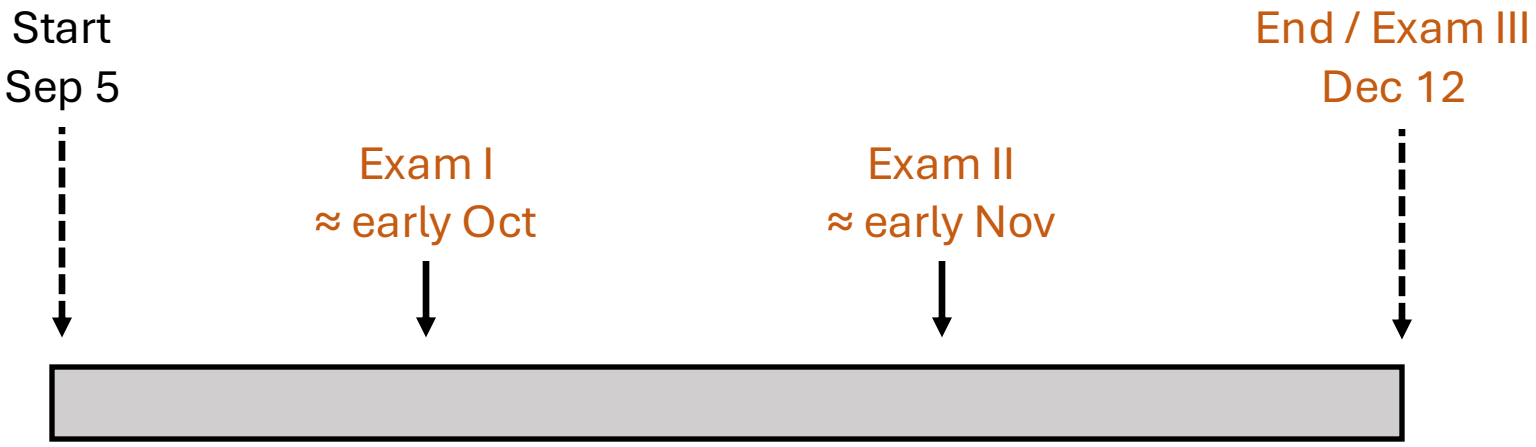
(1) An overview of the most fundamental algorithms and techniques that we believe every PhD computer scientist should know.

(2) A mental workout to help you develop analytic and mathematical reasoning and communication skills for computer science research.

Course Structure



Course Structure



Evaluation:

- 3x exams = 75%
  - Not cumulative but the material builds on itself
- 6x assignments = 25%
  - Drop the lowest score

Grading:

- Standard scale (e.g. A/A- is 90%+)
- Generously curved as needed
- Typical distribution:
  - 50% get A/A-, 50% get B+/B
  - I'm more generous with small classes

Course Website

http://jonathan-ullman.github.io/cs7800-f25

Home | Course Info | **Schedule**

CS 7800: Advanced Algorithms

Fall 2025

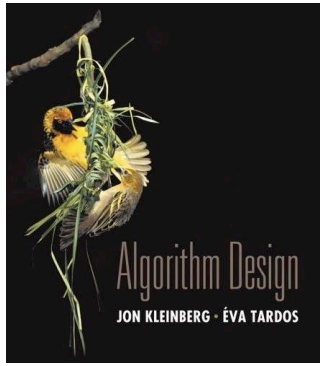
Course Schedule

This schedule will be updated continuously throughout the term.

Date	Topic	Reading	Notes
Fri 09/05/25	**Class 1: Introduction** • Course Overview • Stable Matching [slides after]	—	HW0 Out: [pdf] [tex]
Tue 09/09/25	**Class 2: Greedy Algorithms** • Interval Scheduling • Minimizing Lateness [slides before] [slides after]	KT 4.1–4.2	—

Recommended Resources

- Algorithm Design by Kleinberg and Tardos
  - We'll follow this closely in the 1st half
  - Can easily find copies



- Algorithms by Jeff Erickson
  - Useful for review, alternate perspective, and some advanced topics
  - Will use this more in the 2nd half
  - Free on the web

Assignments

- 6 HW Assignments (probably)
  - Approximately every two weeks
  - Late days: total of 5, max of 2 per assignment
  - Further extensions granted for *special* circumstances

- All questions are algorithms and related mathematics, no programming

- **Review HW 1 out now, due Friday 9/12 at 11:59pm!**
  - No late days—I want to quickly test your background

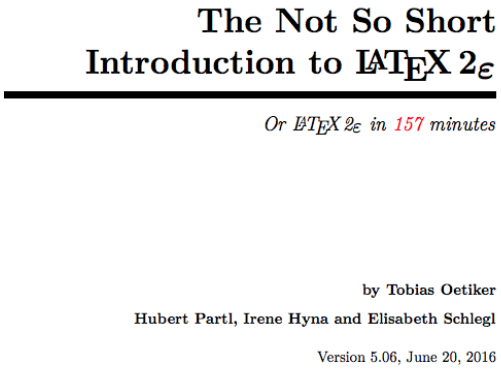
Assignment Philosophy/Policies

- This course has two related-yet-different goals
  - #1: give a working knowledge of algorithms (everyone has to)
  - #2: exercise and stretch your brain (you get out what you put in)
- Exams are for #1 and are most of the evaluation
- Homework is to prepare you for exams and for #2
  - A few *assigned/graded* problems so you get feedback
  - More *optional/ungraded* problems so you can get exercise

- AI/Honestly Policy: *You're adults and scholars, act like it*
  - You can easily ace the assignments using AI, I can't reliably stop you
  - Using AI won't prepare you for exams, which are most of your grade
  - Using AI won't make you a better scholar
  - Using AI wastes my time giving feedback

Assignment Logistics

- Homework must be typeset in LaTeX!
  - You'll have to learn it sometime!
  - Many good resources available
  - Many good editors available (Overleaf, TexStudio)
  - I will provide source to get you started



The Not So Short
Introduction to LaTeX 2ε

Or LaTeX 2ε in 157 minutes

by Tobias Oetiker
Hubert Partl, Irene Hyna and Elisabeth Schlegl

Version 5.06, June 20, 2016

Assignment Logistics

- I use Gradescope for homework
  - Entry code: **D3ERDX**

Discussion Forum

- I’ve used Piazza in the past but I’m open minded!