

CSE 421: Introduction to Algorithms



Course Details Winter 2020

Paul Beame



Introduction to Algorithms

- Introduce the basic techniques for the design and analysis of algorithms.
 - Develop a toolkit of ways to find efficient algorithms to solve problems
 - Prove that the algorithms are correct
 - Analyze their efficiency properties
 - Communicate these algorithms and their properties to others



On efficiency

- Originally, efficiency was important because computers were weak
 - If a computation ran too long, one of the vacuum tubes might fail
 - Storage was extremely expensive
- Now we have powerful computers but
 - Data has grown to be enormous
 - Computation has an energy cost and represents a significant part of society's total energy use
 - Efficient computing helps stop climate change
 - Additional power is of little help for inefficient (e.g. brute force) solutions



Coursework

- Weekly homework assignments
 - Typically 3 problems + 1 extra credit
 - Start early to reduce amount of time you need to concentrate on them
 - Use your brain's background processing
 - OK to talk with fellow students but solution write-up must be your own
 - Use of outside resources **forbidden** – see grading guidelines
- Take-home midterm and final



Grading Scheme

- Grading scheme
 - Homework 50%
 - Midterm 15-20%
 - Final Exam 30-35%

- Extra credit problems not required for 4.0.
 - Max grade change from Extra Credit 0.1-0.2

Course Web Page

CSE 421: Introduction to Algorithms

Winter, 2021

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Lectures

MWF 1:30-2:20. [Zoom link](#)

Office Hours:

Immediately after class until 2:45 + TBA

[Zoom link](#)

This course introduces the basic techniques for the design and analysis of algorithms. It is not only about ways to find efficient methods to solve problems, but also about ways to prove the correctness and efficiency properties of these methods.

Textbook:

[Algorithm Design](#) by Jon Kleinberg and Eva Tardos, Addison-Wesley, 2006. (The International Edition is the same in paperback.)

We will cover almost all of chapters 1-8 of the Kleinberg/Tardos text plus some additional material from later chapters. In addition, I will borrow a small amount of material on divide and conquer algorithms from [Introduction to Algorithms: A Creative Approach](#), by Udi Manber, Addison-Wesley 1989. I make extra material available for this.

Another handy reference is Steven Skiena's [Stonybrook Algorithm Repository](#)



Grading Scheme (Roughly):

Homework 50%

Midterm 15-20%

Final Exam 30-35%

Homework assignments will be weekly. It will be useful to start on them early in order to reduce the amount of concentrated time you need to spend on them. You may discuss solutions to the homework problems with your classmates, but you must write all solutions by yourself and indicate all others with whom you have discussed solutions.

You are not allowed to search for solutions to problems on the internet or other sources outside of those given in class, the textbook, and the course web, or share your solutions through such means.

Both the Midterm and Final Exam will be take-home tests.

Email list:

[Class email list: cse421a_wi21](#) [\[archives\]](#)

Please send any e-mail questions about the course to cse421-staff@cs.cornell.edu.

Course Calendar

Lecture Slides

- [Stable Matching](#)

Reading Assignments

• Chapters 1 and 2 of Kleinberg and Tardos

TA	Office hours	Zoom Room
Anny Kong	TBA	
Jason Waataja	TBA	
Jenna Yee	TBA	
Liangyu Zhao	TBA	
Siddharth Iyer	TBA	
Skyler Hallinan	TBA	
Yonkyu Song	TBA	

Homeworks [\[Grading & academic integrity guidelines\]](#):

Homework submission is due via [Canvas/Gradescope](#)

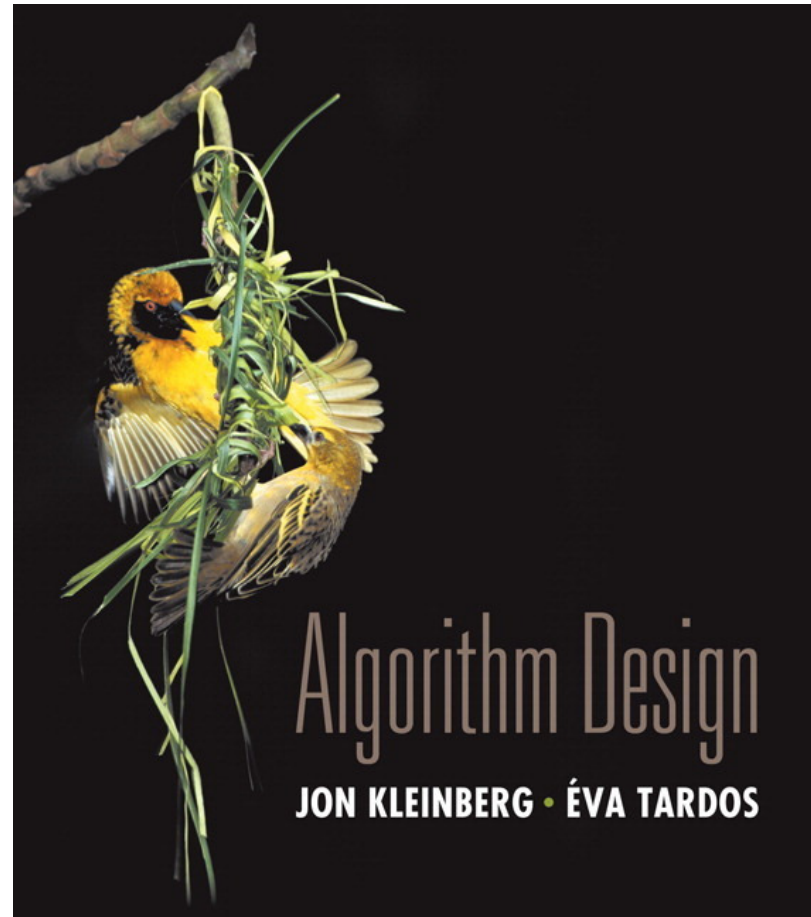
- [Homework 1](#) due Friday, 15-January

Exams:

- **Midterm exam:**
- **Final exam:**

Textbook

- Kleinberg-Tardos:
Algorithm Design
 - International Edition just as good
 - Plus supplements on website
- Worth reading
 - Good for reading sequentially
 - Not as good for random access
- All required content will be on slides





Class email list

- Important announcements will be sent to the class email list:
 - cse421a_wi21@uw.edu



My Contact Info

- Paul Beame
 - Email: beame@cs.washington.edu
 - Staff Email: cse421-staff@cs.uw.edu
 - Office hours:
 - Immediately after class until 2:45
 - Zoom link on webpage
 - Plus TBA



TAs

- TA Office Hours TBA
 - Anny Kong
 - Jason Waataja
 - Jenna Yee
 - Liangyu Zhao
 - Siddharth Iyer
 - Skyler Hallinan
 - Yonkyu Song

- Contact: cse421-staff@cs.uw.edu



Lecture Zoom

- During lecture, please write questions/responses in the Zoom Chat
 - I will monitor the Chat and there will also be a TA during each class who will make sure that I address items that I might have missed



Questions?
