

CS 374 Section B: Algorithms and Models of Computation

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Instructional Staff

- **Instructor:** Mahesh Viswanathan
- **Teaching Assistants:**
 - Shruti Bhargava
 - Charles Carlson
 - Patrick Lin
 - Abhishek Narwekar
 - Vishal Jagannath Ravi
 - Yipu Wang
- **Office Hours:** To be announced on webpage.
- **Contacting Staff:** Use “private note” in Piazza.
- **Course Aides:** To be announced.

Electronic Bulletin Boards

- **Webpage:** General information, course policies, lecture notes
<https://courses.engr.illinois.edu/cs374/sp2018/B/>
- **Piazza:** Announcements, online questions and discussion, contacting course staff. Sign up at
<https://piazza.com/illinois/spring2018/csece374b/>.
- **Moodle:** Everything related to homeworks, quizzes, grades, announcements
<https://learn.illinois.edu/course/view.php?id=28683>

Resources for class material

- **Prerequisites:** All material in CS 173, and CS 225
- **Lecture Notes:** Available on course web-page
- **Video Recording of Lectures:** See course website for link.
- **Additional References:**
 - Automata and Computability: Dexter Kozen
 - Algorithms: Sanjoy Dasgupta, Christos Papadimitriou, Umesh Vazirani
 - See website for more resources

Grading Policy: Overview

Total Grade and Weight

- **Homeworks:** 24%
- **Quizzes:** 6%
- **Midterms:** 40% (2×20)
- **Finals:** 30%

Homeworks

- One homework every week: Due on Tuesdays at midnight on Moodle. Assigned at least one week in advance.
- **No late homeworks.** Lowest 6 homework problem scores will be dropped.
- Homeworks may be solved in groups of size at most 3 and each group submits **one** written solution on Gradescope.

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- Homeworks may be solved in groups of size at most 3 and each group submits **one** written solution on Gradescope.
- For the other homeworks, read Homework Guidelines and Academic integrity policies on course website.

Quizzes

- The day before every class on Moodle.
- About 25 to 26 in total.
- We will drop the 5 lowest scores.

Examinations

- First Midterm: Monday February 19, 7pm to 9pm
 - Conflict exam on Tuesday February 20.
- Second Midterm: Monday April 9, 7pm to 9pm
 - Conflict exam on Tuesday April 10.
- Final Exam: Tuesday May 8, 8am to 11am

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- **No conflict exam offered unless you have valid excuse.**
- Midterms will only test material since the previous exam
- Final Exam will test **all** the course material

Advice

- Attend lectures and discussion sessions
- Make use of office hours/Piazza
- Study regularly and keep up with the material
- Ask plenty of questions, and promptly. Don't delay getting doubts cleared
- This course is on problem solving. Solve as many as you can
- This course about writing rigorous proofs. Review 173 material on writing proofs, especially induction.

Part I

Course Overview

High-Level Questions

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- How can one come up with a way to solve a problem computationally?
- What are the limits of computation?

Course Overview

The course can be roughly divided into three parts.

- **Models of Computation:** Regular languages, finite state machines, context-free grammars, and Turing machines
- **Algorithms:** Algorithm design techniques illustrated through specific algorithms for certain problems
- **Lower Bounds:** Undecidability and NP-completeness

Skills

- Comprehend mathematical definitions
- Write mathematical definitions
- Comprehend mathematical proofs
- Write mathematical proofs
- Learn algorithmic techniques that help solve problems computationally