

MATH 0480: Applied Discrete Mathematics

FALL, 2026

INSTRUCTOR: Weizhi Tang

OFFICE: N527

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OFFICE HOURS: Thursday 11:10–11:55, 16:45–17:30, and 17:40–18:25 (office N527), or by appointment.

LECTURES: Thursday 13:50–16:25, Room S508

TEXTBOOK: Susanna S. Epp, *Discrete Mathematics with Applications*, 4th Edition, ISBN 978-0-495-39132-6.

TEACHING ASSISTANT: Jiahao Li

PREREQUISITE: COMPSI 120/MATHS 120

DESCRIPTION: An introduction to the foundations of computer science, mathematics and logic. Topics include propositional logic, first-order logic, formal deduction, counting, finite probability, mathematical induction, recursion, sets, relations, functions, graphs, basic algorithm analysis, and finite automata.

COURSE OBJECTIVES: To learn to express ideas precisely, speak in mathematical and logical language, reason rigorously, and understand the discrete structures that underlie computer science.

LEARNING OUTCOMES FOR THIS COURSE:

- 1) **Formalization:** Students should be able to express objects, structures, relations, statements, and other ideas in a formal way, using Sets and First-Order Logic;
- 2) **Formal Reasoning:** Students should be able to derive conclusions from premises step by step by applying explicit syntactic rules of propositional and first-order logic, rather than appealing to semantic intuition to justify each step;
- 3) **Discrete Objects and Structures:** Students should be able to recognize, understand, and analyze common discrete objects and structures, such as graphs, trees, automata, etc., that recur throughout advanced courses and research papers.

GRADE DETERMINATION:

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|--------------------------------|-----|
| • Attendance | 5% |
| • Homework ($10 \times 4\%$) | 40% |
| • Midterm I | 15% |
| • Midterm II | 15% |
| • Final Exam | 25% |

EXAMS: Two in-class midterms and one final. For each exam, students may bring one double-sided A4 cheat sheet. No AI tools may be used in any exam.

QUIZZES: N/A

GRADE REBUTTAL: Any request to have a grade reconsidered must be submitted in writing to me or to the teaching assistant within 7 days after the graded work is returned. The request must identify the specific problem in grading and explain why student believes the grade is incorrect. Requests received after that deadline will not be considered.

HOMEWORK: There will be 10 homework assignments, each worth 4% of the final grade (40% in total). Each assignment is due 7 days after it is released. Late submissions will not be accepted unless student have made arrangements with me in advance for appropriate reasons.

ATTENDANCE: Attendance counts 5% of final grade. Students have three absences free of penalty and without prior notification, with each additional absence reducing the attendance grade.

MAKE-UP POLICY: N/A

MATERIAL COVERED: The sequence of the sections covered in this class is:

Week	Contents	Descriptions
1 (09/03)	Chapter 1	Syllabus, Overview & Speaking Mathematically
2 (09/10)	Chapter 2	Propositional Logic
3 (09/17)	Chapters 2 & 3	First-Order Logic
4 (09/24)	Chapters 3 & 4	Formal Deduction
5 (10/01)		National Day Holiday, No Class
6 (10/08)	Chapter 5	Recursion & Induction, Midterm I on 10/08
7 (10/15)	Chapter 5	Recursion & Induction (continued)
8 (10/22)	Chapter 6	Set Theory
9 (10/29)	Chapter 7	Functions
10 (11/05)	Chapter 8	Relations
11 (11/12)	Chapters 8 & 9	Counting and Probability
12 (11/19)		Review, Midterm II on 11/19
13 (11/26)	Chapter 9	Counting and Probability (continued)
14 (12/03)	Chapter 10	Graphs and Trees
15 (12/10)	Chapters 10 & 11	Algorithm Analysis
16 (12/17)	Chapter 11	Algorithm Analysis (continued)
17 (12/24)	Chapter 12	Formal Language & Automata
18 (12/31)	TBA	TBA
19 (01/07)	TBA	TBA
20 (01/14)		Final Exam Week

For **TBA**, depending on the progress of teaching and students' feedback, I may give reviews of previous knowledge if they find the previous content difficult or discuss about discrete optimization if they feel good about previous contents.