EE 362 Discrete Math for Engineers

Textbook: *Discrete Mathematics with Applications*, Fourth or Fifth Edition, Susanna S. Epp.
This is an expensive book but it's complete and easier to read than the alternatives.

Recommended reference textbook (optional, but highly recommended):
Cracking the Coding Interview, 5th or 6th Edition by Gayle Laakmann McDowell, Publisher CareerCup.

Course Room: KUY 310   **Course Times:** MWF 10:30–11:20

Instructor: Narayana Santhanam
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Office: POST 205F
Office Hours: Fri 9:30–10:20 in POST 205F
If the time does not work for you, please email me to schedule a meeting. We will add more slots as the semester heats up.
Objectives: Learn and apply the mathematical foundations common to engineering/computer science arising in the discrete/logical domain, design and analyze algorithms, write and work with proofs and logic.

Topics

Topic	Lect Set #	Reading	Est.# Lectures
Introduction and review of math concepts	1	Chap 1	2
Compound statements	2	Chap 2	3
Quantified statements	3	Chap 3	1
Number theory and proofs	4	Chap 4	5
Sequences and induction	5	Chap 5	6
Functions	6	Chap 7	1
Algorithm analysis	7	Chap 10	6
Graphs including trees	8	Chap 11	8
Relations	9	Chap 8	1
Sets	10	Chap 6	1
Probability	11	Chap 9	5
Finite state automata, regular expressions	12	Chap 12	3
		Lecture total	42

Format: Lectures and in-class discussions. Both lectures and in-class discussions will be in

KUY 310 during the scheduled time (MWF 10:30–11:20). For in-class discussions, students are expected to prepare (view recorded lectures or reading).

Use of AI First and foremost, you should remember that if you end up doing only a subset of what chatGPT can do (either because you think you can use it for homework or worse), you really should be worried. A subscription to chatGPT pro is only $240, and anyone hiring you will wonder if your $100k salary is worth it when chatGPT can do more than what you can do for $240. So you have to outshine AI in some valuable way. You cannot outshine a large language model (LLM) in knowledge when LLMs have memorized the Internet and practically every book known to you or me. So it has to be about thinking, pushing the boundaries of knowledge and building things.

The primary aim of this course is to teach you to think. Many times, we will have questions whose answers are easily available from chatGPT, a natural and unavoidable consequence of covering elementary material that is widely documented.

But please remember, you need to master the basics of thinking if you hope to outshine chatGPT. To aid this, there will be sections when I will indicate it is ok to use AI (usually when exploring advanced topics not usually covered in the scope of this course or to learn to ask questions) and when it is not (usually drill homeworks)—please follow these guidelines.

Assignments:

- 2 Midterm Exams (15% each) and a Final Exam (25%). At least part of each exam will be take-home, with about a week to complete (typically use of AI is ok for this part). An in-class portion may also be included, announced a week in advance.

- Homework and Take-Home Quizzes (25%). Quizzes are typically due at the beginning of the next lecture. Homework usually has a week or more.

- A project (20%) that will be announced around Sep end.