

CS 330 : Discrete Structures

Michael Lee

Syllabus and Overview.

1. Course Logistics
2. Resources
3. Grade Breakdown
4. What is "Discrete Structures" / "Discrete Mathematics"?
5. Topics

1. Course logistics

Lecture
(Wed/Fri)

- concepts, illustrative examples, discussion

Recitation
(Mon)

- low-level QA, lots of sample problems

- both available live (with 131) and online synchronous/asynchronous (recorded)
- lectures on Zoom (why?), recitations on Collab.
- links to recordings will be posted.

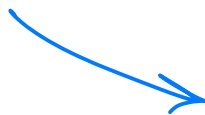
① Read/skim assigned reading



②

Lecture
(Wed/Fri)

(+ participate!)



③ Attempt problem set +
review assigned reading

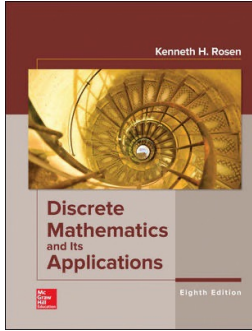
④

Recitation
(Mon)



⑤ leverage
resources to
complete HW.

2. Resources



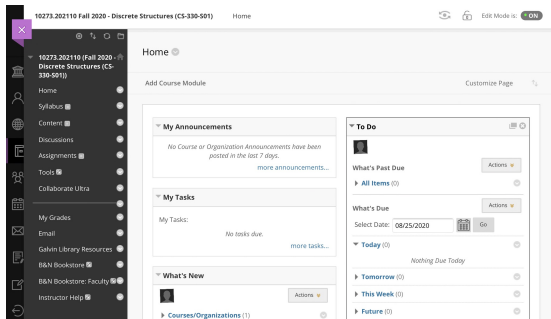
① Textbook

② Website:

<http://moss.cs.iit.edu/cs330>

③ Blackboard

④ Discord



CS 330: Discrete Structures

Announcements

- The Zoom meeting ID for our online lectures is 931.673.5633 — you can join using this link.
- We will be using Discord to run office hours, and it will also serve as our peer support and Q/A forum. If you aren't already a member, please join at <https://discord.gg/m8ZVW5K>.

Calendar

The course calendar is tentative and likely to change. All readings are from the Rosen text.

Aug 26

- Syllabus and Overview

Aug 28

- Propositional Logic
- Reading: §§ 1.1-1.3

Sep 2

- Predicate Logic
- Reading: §§ 1.4-1.6

Sep 4

Assignments

1. Coming soon!

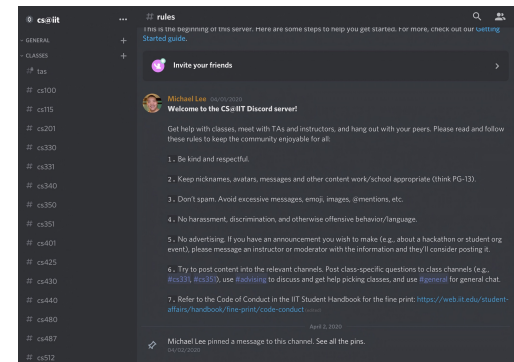
Resources

Schedule

- Lecture: Wed/Fri 9:40AM-10:55AM in Withrick 113 and Zoom
- Recitation: Mon 9:40AM-10:30AM in Withrick 113 and Blackboard Collaborate

Staff

- Instructor: Michael Lee
 - + Email: lee@iit.edu
 - + Office: SS 209C
 - + Hours: Wed/Fri 1PM-2PM on Zoom
- TA: Li Zhang



TA: Li Zhang (email on website)

- help w/ assignments
- assignment grading challenge (cc me)
- office hours on Discord.

3. Grade Breakdown

35% - Assignments

10% - Participation *

15% - Midterm Exam 1

15% - Midterm Exam 2

25% - Final Exam

} open-book/notes, cumulative,
online (platform TBD)

{ A: $\geq 90\%$, B: 80-89%, C: 70-79%, D: 60-69%, E: $< 60\%$ }

Assignments

~10 problem sets, equally weighted.

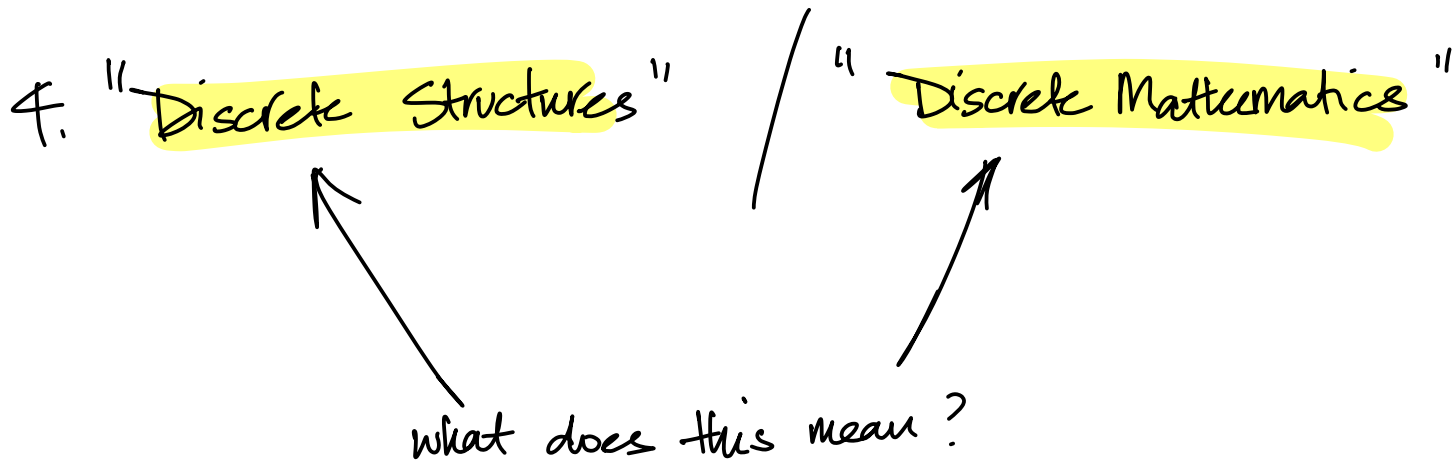
— posted to website

— submit on Blackboard as PDF.

— MUST BE TYPED.

Participation

- I will track participation (voice/text) — points accumulated across semester
- if $< 10/10$, worth of final exam increases so you can make it up (max final exam worth = 35%)



distinct

separate

unconnected

countable

not continuous

Discrete objects/values:

- dice + dice roll results
- integers
- coins
- cities on a map
- binary data
- IP addresses
- steps in an algorithm
- lines of code
- nodes in a graph
- digital watch time

Non-discrete objects/values:

- real numbers
- temperature
- time measurement
- analog watch
time

- how do we represent these objects?

— discrete structures!

e.g. sets, trees, graphs,
truth tables, random variables

- how do we reason about them?

— discrete mathematics!

"Mathematics"

- rigor

- counting / enumerating

of possible starting hands in poker

of steps carried out by some algorithm for given input

of ways to roll X w/ two dice

of ways to traverse locations on a map.

of possible passcodes for a device

- optimization

shortest path between two locations

min # operations to multiply matrices

efficiently sort a large list

- proofs

argument that establishes the truth of some conjecture by logical steps proceeding from some known facts.

e.g. will my algorithm always sort its input correctly?

5. Topics

- Logic + proof techniques
- Sets, Functions, Relations
- Algorithms + Runtime complexity
- Induction + Recursion
- Counting + Combinatorics
- Discrete Probability
- Graphs + Trees
- Languages + Grammars
- Automata: FSMs + Turing machines