

Syllabus, CS 2051

Fall 2021

Instructors: [Gerandy Brito](#)

CS2051 is the honors version of CS2050 and as such, this class will follow a similar path as 2050 but likely will challenge students at a higher level. We will cover the same topics, in some cases will go deeper and we may cover new topics if time allows.

Textbook: Main textbook: Discrete Mathematics and Its Applications by Kenneth Rosen. The format of the book is irrelevant (i.e.: hardcopy, kindle edition, etc) and the edition is also irrelevant. There is a solution guide for older editions that can be very helpful to see solutions step by step. We may use other textbooks that will be announced in lecture.

Format and technical requirements.

The class will be delivered fully in-person.

- All information for the class will be shared on **Canvas**. You are responsible for those announcements done during lecture.
- **Exams** will be conducted on **Gradescope**. We will release a practice exam to help you get familiar with the format. You will need a personal computer to take the exam. If you do not have one, please contact prof. Brito the first week of class.
- **Homework** will be submitted on **Gradescope**. We will release a template to type your homework. If you choose to handwrite your homework, make sure it is legible and easy to read. You may be penalized otherwise.

Grade breakdown.

- Lectures notes 5%.
- Participation: 6%.
- In class quizzes: 9%.
- Homework: 20%
- Two midterm Exams: 30%

After all your grades are entered letter grades are computed according to the following brackets: $A[90, 100]$; $B[80, 90]$; $C[70, 80]$; $D[60, 70]$; $F[0, 60]$. These brackets may change, but only in your benefit. Rounding and curving is unlikely.

Final exam.

There will be a final exam, which will replace your lowest midterm score (if higher, so you can only improve by taking the final). The final exam will be conducted the day and time showed in the official GT calendar. The exam will be cumulative.

Participation.

Participation will be measured by weekly quizzes administered online. These quizzes will be simple questions about the content covered the same week. The two lowest quizzes will be dropped.

Quizzes.

There will be four quizzes during lectures. The format will resemble the format of the midterm and aim to help you to prepare for those. The lowest quiz will be dropped.

Homework policy.

Homework will be posted on Canvas, and submitted on Gradescope. You are encouraged to type your homework. If you choose not to, please be considered of your TAs and write clear and legible. We will penalize your score if your homework is not readable. Once grades are released you will have a week to dispute your grade. Regrade request must be based on solid arguments and frivolous request won't be addressed. Examples of such regrades are "I feel I deserve more points"; "I think the grading was too harsh"; "Please check my solution again"; "I do not know where I made a mistake. Can you read my solution, and tell me what I did wrong, and if I deserve more points?".

Late submissions won't be allowed unless you have an official excuse from Student Services. The lowest homework will be dropped.

Collaboration policy: Collaboration is allowed. You must write your own solutions though. On every homework, you should list the names of those students you collaborated with. Mind that copy a solution from your peer or from the internet is plagiarism and is penalized by the GT Code of Conduct. If cheating is detected, you will receive a zero on the assignment and a report will be filed with the Office of Student Integrity.

Homeworks are the best way to learn the material and prepare for the exams. Your effort on it will be reflective in your exams!

Exam policy.

Exams will be conducted on Gradescope. Exams will be held during regular class times, please see the schedule for the exact days. By registering to take this class, you are responsible for taking the exam during these days. Bring your personal laptop to class the day of the exams. If you do not have one, please contact prof. Brito to arrange for an alternative way to take the exam. There will be no make up exam unless you have an official excuse from Student Services. If that is the case, make sure to contact the staff at least 48 hours in advance. There are obvious exception to this rule (like an accident the day of the exam...which hopefully won't happen). Final decision is at the sole discretion of the instructor.

The regrade policy for exam is the same as for homework.

Students with special accommodations.

You should contact the staff about your accommodations as soon as possible. We need to receive an official letter detailing your accommodations. If you are granted an extension for assignments such as homework and exams, you must contact us at least 48 hours before the deadline. If you fail to do this, your request will be denied. In particular, do not wait to the due date to request an extension. There are obvious exceptions to this rule, but those are really special circumstances.

Introduction to Discrete Mathematics (Honors). Academic calendar.

This calendar is subject to changes. We will communicate those during lectures and on Canvas.

- **Week 1** Logic, propositions and connectors.
Chapters 1.1 and 1.3 in Rosen's book.
- **Week 2** Propositional functions and quantifications. Rules of inference.
September 1st (no class).
Chapters 1.4-1.6 in Rosen's book.
- **Week 3** Set Theory. Functions. **Quiz 1.**
Chapters 2.1-2.3 in Rosen's book.
- **Week 4** Proof techniques. Relations.
Chapters 1.7 and 9.1 in Rosen's book.
- **Week 5** Equivalence relations. Countable sets. **Quiz 2.**
Chapters 9.5 and 2.5 in Rosen's book.
- **Week 6** Induction.
Chapters 5.1-5.2 in Rosen's book.
- **Week 7** Induction.
Chapters 5.1-5.2 in Rosen's book.
Exam 1.
- **Week 8** Growth of functions. Recursions.
Fall break October 11 (no class).
Chapter 3 in Rosen's book
- **Week 9** Recursive algorithms. Number theory.
Chapter 5.4 in Rosen's book
- **Week 10** Congruency classes and greatest common divisor. Chinese remainder theorem.
Quiz 3.
Chapter 4 in Rosen's book
- **Week 11** Applications of congruencies: Fermat's Theorem and primality testing. Euler's Theorem. Cryptosystem RSA.
Chapter 4 in Rosen's book
- **Week 12** Combinatorics. Principles of counting. Probability. **Quiz 4.**
Chapter 6 in Rosen's book. May go into chapter 7.
- **Week 13** Combinatorics. Principles of counting. Probability.
Chapter 6 in Rosen's book. May go into chapter 7.
- **Week 14** Combinatorics. Principles of counting. Probability.
Thanksgiving break, November 24 (no class).
Exam 2.
Chapter 6 in Rosen's book. May go into chapter 7.

- [Week 15](#) Combinatorics. Principles of counting. Probability.
Chapter 6 in Rosen's book. May go into chapter 7.
December 6 [Last day of classes](#).

Final Exam: Friday, December 10, 8:00 AM - 10:50 AM.