CSCI 200A: Math Foundations of Computing
Middlebury College, Fall 2022
Frank Swenton

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	Office:	75SHS 214
Class	MWF 9:05–9:55, 75SHS 203	
Office hours	MW 3:15–4:45, or by appointment	
Homepage	`https://f22.middlebury.edu/CSCI0200A` (or `go/cs200a-f22`)	

Course information

Welcome to CSCI 200! Our goal this term is to build a solid foundation for your work in computer science through the study of several key mathematical concepts: sets and logic; graphs, relations, and functions; mathematical proof; asymptotic growth; basic linear algebra and vector geometry; and assorted other topics. Our essentially Platonic approach will be as follows:

1. To first learn models for correctly *thinking* about the concepts, using the visual whenever possible.
2. To learn the clear and strict *rules* governing the behavior of these concepts.
3. To learn how these concepts are *expressed* in words and via symbols.
4. Finally, to learn to *observe and recognize* these concepts in the messy, ambiguous realm of the real world and its written and spoken language.

Focus on gaining the skills necessary to proficiently perform the tasks you're asked to in this course; these are what you'll learn in class, what you'll be tested on, and what we want you to carry with you after this semester! The ineffable "understanding" that results will be an outgrowth of your fluency with these core concepts and skills, gained by thoughtful engagement with them throughout this course and beyond.

Official statements

The Computer Science Department is devoted to maintaining an inclusive classroom environment; in brief: if you're a human being enrolled in this course, then you are a valuable member of the community of learning surrounding it, both within and outside the classroom, and it is expected that we all behave accordingly. An official statement can be found on the department's homepage.

The Honor Code will be in effect for all examinations and/or quizzes, which are to be completed without any outside assistance. In the event of a schedule conflict during the time of one of our exams, alternate times *in advance of the scheduled time* can be arranged.

A great deal of materials for this course will be online; if you do not have a working laptop, please let me know, as the Department and the College are committed to access to laptops for all students.

Students who have Letters of Accommodation in this class are encouraged to contact me as early in the semester as possible to ensure that such accommodations are implemented in a timely fashion. For those without Letters of Accommodation, assistance is available to eligible students through the Disability Resource Center. Please contact ADA Coordinators Jodi Litchfield and Michelle Audet in the DRC at ada@middlebury.edu for more information. All discussions will remain confidential.

Schedule, coursework, and grading

Class meets Monday, Wednesday, and Friday each week, except as curtailed by the College calendar, and all students are expected to attend each meeting of the class. Daily assignments will vary from playing online games (using the term "game" very loosely!) to working problems either online or on paper, as announced during the semester.

The more you engage with the material, and the more time you spend with it, the more familiar it will become, and the stronger the skill set you'll build. There is no fixed "number of problems to do" or "number of minutes to spend" that will get you to where you need to be with the material in this course—one concept might click immediately, and another might take hours to grasp fully. *There are three keys to success in this course: spending enough time thoughtfully immersed in the material; asking any questions that come up; and taking your own pulse with your grasp of the material, to know when more of the first two are needed.*

Other than 40 points for participation, your course grade will be based entirely upon quizzes and examinations, for which the Honor Code will be in effect; the rationale behind this is two-fold. First, what matters at the end of the day is what *you* can do yourself with nothing but a problem in front of you. Second, and perhaps more important, is the freedom this allows with absolutely everything else in the course. You will not be evaluated on any questions or statements you make during class time or office hours, so please ask questions when you have them! Work together on problem sets, if you can, and ask me or the tutors any question that you have, because there are no Honor code restrictions in play. Just be sure that the work you present on problem sets is yours, and that you understand what's there and could do it again, because that's what matters—"cheating" on an assignment literally only cheats yourself, as it's not for points. Aside from quizzes and exams, *everything else* (myself, class time, assignments, your classmates, tutors, etc.) is there to help you learn the material of the course as best possible, so take advantage of everything available to you this semester. Our goal is to build a community of learning surrounding this course, and each one of you are a part of that!

Course components and topics

Quizzes (100 points total) will be relatively short and will take place at the start of class on most Mondays, covering roughly the past week's material. Exact topics will be announced on Fridays, but the *tentative* quiz topics are listed below, with dates marked on the calendar. There will be more than 100 points possible on the quizzes in total, so missing a quiz or having a subpar performance on one or two will not greatly affect your grade.

Exams 1–3 (120 points each) will take place in the evening, as listed on the calendar; the **Final Exam** (120 points) will be as scheduled by the College (tentatively set for December 14 at 9:00am).

Participation (40 points) in class, during tutoring sessions, etc., giving 600 points total for the course.

There are no pre-determined point ranges for letter grades, but over 90% guarantees the A range, over 80% guarantees the B range, etc.

Exam 1   Sets [Q1], Logic [Q2], Proofs [Q3], and Graphs [Q4]

Exam 2   Relations and Functions [Q5]; Combinatorics [Q6] and Probability [Q7]

Exam 3   Complexity and Asymptotic Behavior [Q8], Vector Geometry [Q9], and Extra Topics [Q10]

Final Exam   *Cumulative—format and topic coverage will be laid out during the last week of the term*