

Course Procedures

*Lecturer: Michael Bender**Scribe: Michael A. Bender*

1 Times and Locations

- Lectures: Tuesday and Thursday from 1:00pm-2:20pm in Old CS 2120.
- Recitation: Tuesday 2:30pm–3:23 pm in Old CS 2120. Recitation is mandatory.
- Prof Office Hours:
To be posted on Brightspace and website.
- TAs: We have some fantastic TAs. Their contact information will be on Brightspace. At the time of this writing, we have three. Hopefully we'll get more. Please get to know your TAs. They are amazing.
- TA Office Hours:
To be posted on Brightspace.

2 Logistics

We will hold lectures in person.

- We will take photos of everything that I write on the chalkboard.
- If students want to help arrange it, we can make recordings of the lecture. (There's no Echo360 in our lecture room.)
- You may want to purchase a tablet with a pen (e.g., an iPad and Apple pencil) to help you collaborate with others online. You can use Jamboard, which is free shared-whiteboard software. It runs as an app on a tablet. A more limited version runs in the browser. It's not obligatory but may make your life much happier.

TBD which office hours are in person and which online (using a combination of Zoom and Jamboard).

3 What This Course is About

Topics

This class will introduce foundational concepts needed for advanced understanding of all areas of computer science. We will cover basics of sets, propositional logic and proof strategies, induction, recurrence relations and their solutions, lists, trees, graphs, elementary number theory, counting, and probability.

Course Objectives

- Provide students with a rigorous introduction to proof techniques including propositional logic and mathematical induction.
- Introduce recursion as a basic paradigm for computing with functions.
- Introduce fundamental discrete structures such as functions, graphs, and trees.
- Build a strong theoretical foundation for subsequent courses in the CS curriculum.
- Make you smarter. ☺
- Help you appreciate the theoretical foundations underlying all of CS.

Other Objectives

- Make your introduction to SBU smooth.
- Introduce professional skills.
 - How to become an A student at SBU.
 - How to study for classes efficiently.
 - How to understand what's going on in a professor's head.
 - How to do technical writing.
 - How to give effective presentations.
 - How to approach research.

Course Outcomes

- An ability to use logic and basic proof techniques, such as mathematical induction.
- An ability to compute with recursion as a basic paradigm.
- An ability to define and use discrete structures such as functions, graphs and trees.

4 How to Do Well in This Class

- Make sure that your class schedule allows you enough time to devote enough time to this class.
- Study. This is advanced material, which requires effort to digest.
- Do all the problem sets seriously.
- Go over lectures and lecture photos several times. (E.g., recopy your notes.)
- Best way to study for exams: Redo *all* the old problem sets and old exams *from scratch*.

- Work with a partner. Work in a group.
- Don't get lost. If you are having trouble or falling behind, please come see me.
- Come to office hours.
- Start the homework early.
- When you don't understand something, ask questions in class—to me, not whispering to your neighbor.

5 Prerequisites

- Mathematical maturity.

6 Requirements

- One final.
- One midterm.
- 5-7 problem sets. (Every 1-2 weeks.)

7 Problem Sets

- Do problem sets in latex.
- Give an example/picture for each problem.
- Hand in both the PDF and a tarball of the source on blackboard.
- It is your responsibility to keep copies of all work that you hand in.
- Late assignments will not be accepted.
- If you work with people or have *any* other sources, you *must* cite them.

8 More Homework Procedures

- Cite everyone you work with.
- You must write up all your solutions yourself.
- You can share ideas, but it is plagiarism to share any part of your writeup.
- It is plagiarism to get your solution from any other student's writeup.
- Don't try to Google solutions. It's not worth it. You may obtain the answer but you won't learn very much. You will get seriously burned if you are caught plagiarizing.

- If you learn the answer to one of your problems from a book or from the web, then you must cite. You will get burned if you search for answers on the web, rather than trying to solve them.
- For more details, see the assignment on academic dishonesty.

9 Camera

- We'll take photos of everything I write on the chalkboard. Then I'll post on Blackboard.

10 Grading

- Homework and participation will be worth approximately 15% of the grade, the midterm will be worth approximately 35% of your grade, and final will be worth approximately 50% of your grade. I reserve the right to adjust this formula for generating raw scores by a small amount. (If we don't get enough grading support, I'll adjust this formula a little more.)
- You get 25% of any question in an exam by saying I don't know.

11 Dates

- We haven't set the midterm date yet, but it will most likely be on a Tuesday. Possible dates are: October 24, October 31, November 7, or November 14. (Note that the course-withdrawal date is Friday, October 27.) I'd like the midterm to be on a day when you don't have many other exams, so that you have a chance to study. Usually, this means a midterm closer to the end of the semester. (And students in CSE 150 often do better when the midterm is on the later side.)
- The final exam takes place on Thursday, December 21, 2023 from 11:15am-1:45pm according to the Stony Brook final examination schedule in a location TBA.
See <http://www.stonybrook.edu/commcms/registrar/registration/exams.html>.

12 Course Materials

- The online book *Mathematics for Computer Science* by Eric Lehman and Tom Leighton is the "official" textbook. This book is available for download on blackboard.
- I will also be following some lectures from the MIT course 6.042J / 18.062J Mathematics for Computer Science from Spring 2005. (See <http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-042j-mathematics-for-computer-science-spring-2005/>). The notes are also available for download on blackboard.
- A supplementary recommended book is *Discrete Structures, Logic, and Computability* by James L. Hein.

13 Scribing

If students want to scribe lectures and/or practice problems in latex, please let me know. You will get some extra credit for the scribing, but not enough to make it worthwhile just for the grade. It's worthwhile because of the experience doing technical writing.

14 Practice Problems

These may be extra examples based on each lecture. The point is to give extra examples to work through, so that if you understand the examples, then you know that you understand the lecture. After each lecture, we can spend class time trying to come up with these problems together. If the class likes finding these problems, we can find more of them. If not, we will have fewer of them. This doesn't work unless students from class drive the process of nailing down the problems.

15 Academic Integrity

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at: http://www.stonybrook.edu/commcms/academic_integrity/.

I take academic honesty *very* seriously. Infractions have serious consequences. It is *your* responsibility to ensure that you understand what constitutes academic dishonesty.

See the academic honesty assignment for more details.

16 Special Assistance

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, Stony Brook Union Suite 107, (631) 632-6748, or at sasc@stonybrook.edu. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and the Student Accessibility Support Center. For procedures and information go to the following website: <https://ehs.stonybrook.edu//programs/fire-safety/emergency-evacuation/evacuation-guide-disabilities> and search Fire Safety and Evacuation and Disabilities.