CSE 350 Theory of Computation: Honors	Lecture 1
Course Procedures	
Lecturer: Michael Bender	Scribe: Michael A. Bender

1 Times and Locations

- Lectures: Tuesday and Thursday 11:30am–12:50pm.

- Recitation (mandatory): Tuesday 2:30pm–3:23pm.

- Prof Office Hours:
  Posted on blackboard.

- TAs:
  Gilvir Gill <gilvir.gill@stonybrook.edu>,
  Eric Keough <eric.keough@stonybrook.edu>,
  Kenny Zhang <kenny.zhang@stonybrook.edu>.

- TA Office Hours:
  Posted on blackboard.

2 Meeting Logistics

- We will run lectures using a combination of Zoom and Jamboard. See blackboard for the necessary links.

- Jamboard is free. It runs as an app on a tablet. A more limited version runs in the browser.

- I recommend that you purchase a tablet with a pen. E.g., an ipad and apple pencil. It will make your life much happier.

3 What This Course is About

Motivating Questions

- What is computation?

- What counts as a computer?

Primary Goal of Course

Develop a theory out of the idea of computation that is

- clean and simple,

- mathematically rigorous, and

- general.

Other Course Goals

- Understand the beautiful theoretical foundations of computer science.

    - Hint: it's not this: "Oh you're a computer scientist. Can you fix my computer? You must be a wiz with MS Excel."

- Learn how some of these ideas can be applied in other areas of CS.

    - While a particular programming language will eventually become outdated, what you learn in CSE 350 always be relevant.

- Help you think rigorously when you go out in the field.[1]

- Improve your mathematical skills.

- Learn techniques for succeeding as a computer scientist, student, and researcher.

4 How to Do Well in 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 immediately.

5 By the end of the course, you should have....

- An ability to define and use abstract models of computation such as finite and push-down automata, and analyze their relative expressive power.

- An ability to define, use, and convert between abstract machine models and formal languages.

- An understanding of the power and inherent limitations of algorithmic computation.

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[1]Story from former students. At the time they thought that Theory of Computation was just theory. But they use it all the time in the field.

6 Prerequisites

- Mathematical maturity.

- Some programming background/undergraduate algorithms class.

7 Requirements

- One final.

- One midterm.

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

- Practice problems.

8 Problem Sets

- Do problem sets in latex.

- Put an example/picture for each problem.

- Hand in both the PDF and a tarball/zipfile of the source. Hand in problem sets electronically. If the TA also wants hard copies, then please submit these as well.

- 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.

9 Extra Credit

- Keeping your camera on in zoom meetings.

- Participating.

- Scribing practice problems.

- Suggesting exam problems.

- Hosting review sessions/weekly work sessions/etc.

Problem-Solving Procedures on Homework

- Cite everyone that you work with.

- You must write up all your solutions yourself.

- You can share ideas, but it is academically dishonest to share any part of your writeup.

- It is academically dishonest 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.

10   Grading

- Homework, attendance, 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 (e.g., 5%-7%).

- You get 25% of any question in an exam by saying I don't know.

- As mentioned earlier, there will be some opportunities for extra credit.

11   Dates

- The most likely date for the midterm is during the week of October 19, 2020 or October 26, 2020. (We can discuss specifics in class.)

- The exam schedule is here:
  http://www.stonybrook.edu/commcms/registrar/registration/exams.php.   According to this website, our exam takes place on Wednesday, December 16, 2020 from 11:15am–1:45pm.

12   Books

There is no required textbook for this course. Recommended textbooks include:

- *Introduction to the Theory of Computation* by Michael Sipser.

- *Elements of the Theory of Computation* by Harry R. Lewis and Christopher Papadimitriou.

- *Computational Complexity: A Modern Approach* by Sanjeev Arora and Boaz Barak.

You can also look at other online courses for extra material.

13   Scribing

If students want to scribe lectures 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.

If multiple students scribe the same lecture, then just the best set of scribe notes gets extra credit.

14   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.

15   Americans with Disabilities Act

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Student Accessibility Support Center, ECC (Educational Communications Center) Building, Room 128, (631) 632-6748. They will determine with you what accommodations, If any, 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 Student Accessibility Support Center. For procedures and information go to the following website: `http://www.stonybrook.edu/ehs/fire/disabilities`.