

Course Procedures

*Lecturer: Michael Bender**Scribe: Michael Bender*

1 Times and Locations

- Lectures: Monday and Friday in 137 Harriman Hall.
- Professor: Michael A. Bender
Office: New Computer Science Building Room 245
- Professor's office hours and location:
 - Mondays 12pm–1pm (right before class) in 137 Harriman Hall
 - Fridays 2:30pm–3:30pm (right after class) in 137 Harriman Hall.
- Graduate TAs:
 - Thang Bui <tbui@cs.stonybrook.edu>.
 - Santiago Vargas <savargas@cs.stonybrook.edu>.
- Undergraduate TAs:
 - Edwin Alvarez <edwin.alvarez@stonybrook.edu>.
 - Jake Christensen <jake.christensen@stonybrook.edu>.
 - Victor Zhen <victor.zhen@stonybrook.edu>.
- The TAs office hours are posted separately.
- Note: Whenever you send me email, please also send email to all course staff.

2 What This Course is About

Course Objectives

- Learn a toolbox of algorithmic techniques to solve problems in system design, programming, daily life, and theory.
- Learn how to write algorithms having performance guarantees.
- Learn theory that is useful to both theoreticians and system builders.
- Learn how to make a proof of correctness.
- Learn algorithmic ways of modeling computer systems.
- Appreciate beauty in algorithms.
- Make you (effectively) smarter. ☺

Course Outcomes

- Ability to perform worst-case asymptotic algorithm analysis
- Ability to define and use classical combinatorial algorithms for problems such as sorting, shortest paths and minimum spanning trees
- Knowledge of computational intractability and NP completeness

3 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—to me, not whispering to your neighbor.

4 Prerequisites

- Mathematical maturity.
- Some programming background/undergraduate algorithms class.

5 Requirements

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

6 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.
- Please 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. Please see the homework on academic honesty.

Problem-Solving Procedures on Homework

- Cite whom 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. Figure it out your solution yourself (or with your homework partners). If you can't, then leave the question blank. This is a class where you learn how to solve problems yourself, not surf the web.

7 Camera

- We'll take photos of everything I write on the chalkboard. Then I'll post on Blackboard.
- Some days I'll forget my camera. If you have a camera, please bring it to serve as a backup. I'll be grateful.

8 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.
- You get 25% of any question in an exam by saying I don't know.

9 Dates

- The midterm will be on a Friday. It will be either March 31, 2017, April 7, 2017, or April 14. (Please let me know when your other exams are so we can avoid as many conflicts as possible.)
- The final exam takes place on Tuesday May 16, 2017 in a location TBA according to the Stony Brook final examination schedule.
See <http://www.stonybrook.edu/commcms/registrar/registration/exams.html>.

Recommended Books

- Introduction to Algorithms, Third Edition by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein.
- Algorithms by Sanjoy Dasgupta, Christos H. Papadimitriou, and Umesh Vazirani.
- Algorithm Design by Jon Kleinberg and Éva Tardos.
- MIT Open Courseware Introduction to Algorithms 6.046J/18.401J.
- You can also look at other online courses for extra learning material. If you see something that you particularly like, please let me and the rest of the class know.

10 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 are 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/uaa/academicjudiciary/>.

- I take academic honesty *very* seriously.
- It is *your* responsibility to ensure that you understand what constitutes academic dishonesty.
- It is academically dishonest to hand in a solution that you don't understand.
- See the academic integrity assignment for more details and more explanation.

11 Americans with Disabilities Act

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, 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.

12 Critical Incident Management

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures.

Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook. If you have any questions, please contact Donna Di Donato in the Office of Undergraduate Academic Affairs (2-7080).