CSE 320: System Fundamentals II
Spring 2019

LECTURE02
Sergey Madaminov

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Old CS Building, Room 2125
Office Hours: Tuesdays 12:00-14:00pm and Fridays 10:00-12:00

Lecture: Tu/Th 10:00-11:20pm in Staller M0113

Course Description: This course will introduce programming and essential concepts of operating systems, compilers, concurrency, and performance analysis, focused around several cross-cutting examples, such as memory management, error handling, and threaded programming.

Prerequisite(s): CSE major, and completed CSE 220 with a C or higher.
Note(s): A minimum grade of C is required in this course for the CSE major or minor.
Credit Hours: 3

Required Text: *Computer Systems: A Programmers Perspective*, 3rd Edition, Pearson, 2016.
Author(s): Bryant and O'Hallaron; **ISBN-10:** 0-13-409266-x

Required Text: *Linux Man Pages*, https://www.kernel.org/doc/man-pages/

Optional Text: *The C Programming Language*, 2nd Edition, Prentice-Hall, 1988. **Author(s):** Kernighan and Ritchie; **ISBN-10:** 0-13-110370-9

Optional Text: *Learn C the Hard way*, Addison-Wesley Professional, 2015. **Author(s):** Zed Shaw; **ISBN-13:** 978-0321884923

Optional Online Text: *The C Book*, http://publications.gbdirect.co.uk/c book/

Optional Online Text: *The GNU C Reference Manual*,
https://www.gnu.org/software/gnu-c-manual/gnu-c-manual.html

Optional Online Text: *Beej's Guide to C Programming*,
http://beej.us/guide/bgc/output/html/singlepage/bgc.html
Course Objectives:
At the completion of this course, students will have:

1. Developed an understanding of the components of the system stack and how they interoperate.
2. Developed an ability to program with operating system APIs.

3. Developed an ability to analyze application performance and understand the influence of system components on application performance.
4. Developed an ability to write and analyze multi-threaded programs.

Course Homepage & PIAZZA:
https://compas.cs.stonybrook.edu/~smadaminov/courses/320.html

This term we will be using PIAZZA for class discussion. The system is highly catered to getting you help fast and efficiently from classmates, the TAs, and Professors. All non-personal course-related communication should be posted to the discussion board. If you have questions about assignments, technical problems that need troubleshooting, or other questions that might be of interest to other students, they must be posted to PIAZZA and not emailed to the instructor or TA.
If you have any problems or feedback for the developers, email team@piazza.com. Find our class page at: https://piazza.com/stonybrook/spring2019/cse320s19/home

Course Announcements: Course announcements will be posted to PIAZZA. You are expected to be aware of course announcements.

Grading Scheme: *Pass/No Credit (P/NC) option is not available for this course.*

Quizzes & Programming Assignments	45%
Midterm Exams	30%
Cumulative Final Exam	25%

Course Policies:

- **Programming Assignments**

  - A major component of the course is learning to program in C. Therefore, to pass the course with a grade of a C or higher students must satisfy the following 2 criteria: (i) can miss only 1 assignment and (ii) must demonstrate an ability to program in C.

  - The course will contain 5 programming assignments, each worth 100-150 points. At most, a total of 100 points of Assignment Extra Credit may be offered during the semester.

  - Students are expected to work independently. **Offering** and **accepting** solutions from others is an act of **plagiarism**, which is a serious offense and **all involved parties will be penalized according to the Academic Honesty Policy**. Discussion amongst students is encouraged, but when in doubt, direct your questions to the professor, tutor, or lab assistant.

  - Programming assignments must be turned in on the day they are due. Students are urged to plan ahead to avoid problems such as congestion or failure of computer facilities at the last minute. If your assignment is incomplete or is not working by the due date, turn in whatever you have.

  - Each student will be given **0 grace days** for use during the semester. A grace day is a full 24-hour grace period. You may use them as you see fit to extend the deadline of an assignment. There are no partial grace days - one second late counts as a full day.

- **Extensions or late assignments will NOT be accepted under any circumstances**.
- **Note due to limited resources for grading, programs which do not compile or run for testing may not be graded.**
- **Grading Issues:** All issues with grading must be emailed to the instructor within 1 week of release of the graded assignment. Any requests/concerns after this date will not be honored. The email must include a detailed explanation of the specific grading issues and reason/correction. We believe students often learn by investigating and understanding their mistakes. Therefore, it is the responsibility of the student to determine the issues, not the grader/instructor/TA.

- **Examinations**

  - Exams are closed book, closed notes.
  - **No makeup exams will be given, except for PRIOR excused absences with official documentation approved by the University.**

- **Attendance**

  - Attendance is expected and highly encouraged.
  - Students are responsible for all missed work, regardless of the reason for absence. It is also the absentee's responsibility to obtain all missed notes or materials.

Etiquette:

- **PIAZZA**
  Students are expected to use the PIAZZA forum for all non-personal course-related communication. If you have questions about assignments, technical problems that need troubleshooting, or other questions that might be of interest to other students, they must be posted to PIAZZA and not emailed to the instructor or TA.

  PIAZZA is a forum for additional learning and assistance. It is not the place for cyberbullying, memes, grade complaints, concerns/comments/criticisms about the course, or in general, anything unrelated to the course material and your learning. Improper behavior will result in the deactivation of PIAZZA and reporting of the individual's behavior to University Office of Community Standards.

- **Email**
  All course logistic and grading emails should be directed to **smadaminov@cs.stonybrook.edu**

  Email your Professor directly in the following circumstances:

  - If you cannot come to office hours and need to set up an appointment to meet at another time; in this case you must include your availability for the upcoming week.
  - Making arrangements for disability accommodations.
  - To discuss private, personal matters that are impacting your coursework such as physical or mental illness, death in the family, etc.
  - If the instructor asks you to email them something relating to a previous conversation.

When emailing, use the following guidelines to ensure a timely response:
- use your official @cs.stonybrook.edu email account
- use a descriptive subject line that includes "CSE 320", identifies the item you are emailing about, and a brief note on the topic (eg. "CSE320: HW1 Submission error", "CSE320: HW2 Blackboard Grade")
- begin with a proper greeting, such as "Dear Prof. Madaminov", or "Hi Prof. Madaminov"
- briefly explain your question or concern or request
- end with a proper salutation that includes your full name, repoid/netid, and SBU ID number

Academic Dishonesty:

You may discuss the assignments with anyone you like, however each students' assignment (including coding) which they submit must be their own work, and only their own work. Any evidence that source code or solutions have been copied, shared, or transmitted in any way (this includes using source code downloaded from the Internet or written by others in previous semesters!) will be regarded as evidence of academic dishonesty. The College of Engineering and Applied Sciences regards academic dishonesty as a very serious matter, and provides for substantial penalties in such cases, such as receiving an 'F' grade, or expulsion from the University. For more information, obtain a copy of the CEAS guidelines on academic dishonesty from the CEAS office.

All examinations will be closed-notes and closed-book. No electronic devices of any kind will be permitted to be used during exams. All cell phones must be turned off during exams. Any use of electronic devices, textbooks, notes or any other materials will constitute cheating.

Be advised that any evidence of academic dishonesty will be treated with utmost seriousness. Those involved will be prosecuted to the fullest extent permitted by the University and College laws. 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. Any suspected instance of academic dishonesty will be reported to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website.

Students with Disabilities:

If you have a physical, psychological, medical or learning disability that may impact on your ability to carry out assigned course work, I would urge that you contact the staff in the Disability Support Services office (DSS), ECC Building (behind SAC), 632-6748/TDD. DSS will review your concerns and determine, with you, what accommodations are necessary and appropriate. All information and documentation of disability is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to their and search Fire Safety and Evacuation and Disabilities.

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.

CSE320 Spring 2019 - Tentative Course Outline

The weekly coverage might change as it depends on the progress of the class. However, you must keep up with the reading assignments.

Week	Tentative Course Content	Readings
Week 1	• Introduction & Overview • C Programming	Chap 1, C Reference
Week 2	• C Programming	
Week 3	• C Programming	
Week 4	• Dynamic Memory Allocation	Chap 9.9-9.11
Week 5	• System Stack: Hardware Interrupts, Hardware Exceptions & Software Exceptions	Chap 8
Week 6	• System Stack: Hardware Interrupts, Hardware Exceptions & Software Exceptions	
Week 7	• System Stack: OS Signals	
Week 8	• System Stack: POSIX abstractions (pipes, fork, files, etc)	Chap 10
Week 9	• Concurrent Programming - Threads and Locks	Chap 12.4-12.8
Week 10	• Concurrent Programming - Shared Resource, Deadlock and Race conditions	Chap 5
Week 11	• Performance	Chap 5.14
Week 12	• Memory: Caches	Chap 6
Week 13	• Memory: Virtual Memory	Chap 9.1-9.8
Week 14	• Memory: Memory Mapping & Linking	Chap 7