CSE 320: System Fundamentals II (L01, Stark)

Spring 2019

Note: This is the syllabus for CSE 320 Lecture 01, taught by Prof. Stark. The syllabus for Lecture 02, taught by Sergey Madaminov, can be found elsewhere.

Instructor:

Pro. Eugene W. Stark
stark@cs.stonybrook.edu
New CS Building, Room 133
(631) 632-8444
Office Hours: Tuesday, Thursday: 2:00PM - 4:00PM

Lecture Time/Place: Tu/Th 8:30-9:50am (Javits 102)

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


**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 inter-operate.
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:**
https://bsd7.cs.stonybrook.edu/~cse320/

**Piazza:**
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/cse320/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.*

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes &amp; Programming Assignments</td>
<td>45%</td>
</tr>
<tr>
<td>Midterm Exams</td>
<td>30%</td>
</tr>
<tr>
<td>Cumulative Final Exam</td>
<td>25%</td>
</tr>
</tbody>
</table>

**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 include 5 programming assignments, each worth 9% of the final course grade.

Students are expected to work independently on the programming assignments. You may *discuss* the homework in this course with anyone you like, however each student’s submission, including *written material* and *coding*, must be their own work, and only their own work. Any evidence that written homework submissions or source code have been copied, shared, or transmitted *in any way* between students (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.

- 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 3 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. No late code changes will be permitted. You are responsible for testing your code before submitting it.

- Note due to limited resources for grading, programs that do not compile or run for testing might not be graded.

- Grading Issues: All issues with grading must be emailed to cse320@cs.stonybrook.edu 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

- 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.

- 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 cyber-bullying, 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 **cse320@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 @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 salutation, such as “Dear Prof. Stark”, or “Hi Prof. Stark”.
- briefly explain your question or concern or request
- end with a proper closing that includes your full name, repoid/netid, and SBU ID number

**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/index.html](http://www.stonybrook.edu/commcms/academic_integrity/index.html)

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 policies.

**Student Accessibility Support Center Statement:**

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. [https://www.stonybrook.edu/commcms/studentaffairs/sasc/current_students/accommodation.php](https://www.stonybrook.edu/commcms/studentaffairs/sasc/current_students/accommodation.php)

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](http://www.stonybrook.edu/ehs/fire/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 University Community Standards 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.
**CSE320 - 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.

<table>
<thead>
<tr>
<th>Week</th>
<th>Tentative Course Content</th>
<th>Readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>• Introduction &amp; Overview&lt;br&gt;• C Programming</td>
<td>Chap 1, C Reference</td>
</tr>
<tr>
<td>Week 2</td>
<td>• C Programming</td>
<td></td>
</tr>
<tr>
<td>Week 3</td>
<td>• C Programming</td>
<td></td>
</tr>
<tr>
<td>Week 4</td>
<td>• Linking, Dynamic memory allocation</td>
<td>Chap 7, 9.9-9.11</td>
</tr>
<tr>
<td>Week 5</td>
<td>• Dynamic memory allocation&lt;br&gt;• Exceptional control flow, exceptions</td>
<td>Chap 9, 8.1-8.4</td>
</tr>
<tr>
<td>Week 6</td>
<td>• Processes, process control</td>
<td></td>
</tr>
<tr>
<td>Week 7</td>
<td>• Processes, process control&lt;br&gt;• Signals, signal handlers</td>
<td>Chap 8.5-8.8</td>
</tr>
<tr>
<td>Week 8</td>
<td>• Signal handling, nonlocal jumps&lt;br&gt;• System-level I/O: Unix I/O, file system concepts</td>
<td>Chap 10</td>
</tr>
<tr>
<td>Week 9</td>
<td>• System-level I/O: file descriptors, sharing files, pipes, redirection, Standard I/O</td>
<td></td>
</tr>
<tr>
<td>Week 10</td>
<td>• Concurrent programming: motivation, threads overview</td>
<td>Chap 11.1-11.4, 12.1-12.3</td>
</tr>
<tr>
<td>Week 11</td>
<td>• Synchronization: race conditions, mutual exclusion, semaphores, bounded buffer, Readers &amp; Writers</td>
<td>Chap 12.4-12.8</td>
</tr>
<tr>
<td>Week 12</td>
<td>• Thread safety, races, deadlocks</td>
<td></td>
</tr>
<tr>
<td>Week 13</td>
<td>• Memory hierarchy, cache concepts&lt;br&gt;• Cache memories</td>
<td>Chap 6</td>
</tr>
<tr>
<td>Week 14</td>
<td>• Virtual memory: basic concepts, TLB’s, multilevel page tables</td>
<td>Chap 9.1-9.8</td>
</tr>
</tbody>
</table>