CS307 Operating Systems

Syllabus

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What is this course about?

- Getting you familiar with the operating system concepts and design principles
- Have some experience through theoretical lectures and practical projects.
Course Material

- Course slides can be reached through sucourse+
- I will upload the slides and some video lectures to sucourse+
- I will use Zoom and offline video lectures to teach the course material
- All discussions that may interest the other students should be done through sucourse+
- Text book:
  - Modern Operating systems, 3rd edition
  - Andrew S. Tanenbaum
Grading (Midterms)

- **12 Mini Exams (5% each)**
  - Attending at least 10 of them is required, total $10 \times 5 = 50\%$
  - If you attend more than 10, we will consider your 10 best scores for your overall grade
  - No makeup for the mini exams
  - Duration 20-30 minutes
  - One exam each week starting from the second week. Exact dates will be announced one week in advance.

- **Final**
  - 30\%
Grading (Projects)

- 20%
- 4 programming assignments (5% each)
- You may have to do an online demo and answer questions in some of the assignments
- Since we are designing new assignments each year, there maybe +-1pt change in points allocated.
Your TAs

- To be announced
- My Office Hours:
  - Email me for an appointment
Some policies

- I will know you better if you attend the lectures
- Knowing you better means being a reference for finding internship, grad applications, job applications etc
Some motivation for you

- **Students need to:**
  - contribute to the course (by attending and asking questions)
  - Show their abilities in exams and projects
Threshold for passing the course

- You have to collect 45 points overall to pass the course
- Try to collect as many points as possible from the mini exams and programming assignments
- Final will be a little more challenging
## Points to Grades

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>[90-100]</td>
<td>A</td>
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<tr>
<td>[85-90)</td>
<td>A-</td>
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<td>[80-85)</td>
<td>B+</td>
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<td>[75-80)</td>
<td>B</td>
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<td>[70-75)</td>
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<td>[45-50)</td>
<td>D</td>
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<td>[0-45)</td>
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List of Topics

- Introduction Computer Systems
- Processes and threads: process and thread models, management, and implementation
- Interprocess Communication: race conditions, critical regions, mutual exclusion
List of Topics

- Interprocess Communication: race conditions, critical regions, mutual exclusion
- Interprocess communication: sleep and wakeup, semaphores, mutexes, monitors, message passing, and barriers.
List of Topics

- Classical interprocess communication problems: The dining philosophers problem, readers and writers problem, the sleeping barber problem.
- Scheduling: batch, interactive, and real-time.
- Deadlock Detection, recovery, and avoidance
List of Topics

- Memory management: basics, swapping, virtual memory
- Page replacement algorithms Design and implementation issues of paging systems, segmentation
- Segmentation with paging
- Files directories and file system implementation.
List of Topics

- Security issues: cryptography, authentication, attacks, and protection mechanisms, trusted systems
- UNIX, LINUX, and WINDOS Operating Systems