CS 3733 Operating Systems

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The University of Texas at San Antonio
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General Information

Self introduction
- Research interests: security, reliability and performance of Big Data systems and parallel systems (Software Research Group)
- Looking for REU student

Class Web
- Syllabus, class schedule and slides/handouts

Prerequisites:
- CS 3423 (Systems Programming)
- CS 3843 (Computer Organization)
- Knowledge of C/C++/Java

Contact Information

Office: NPB 3.328
Office hours:
- Tuesday: 1:00pm – 3:50pm
- Or by appointment

Email: Tongping.Liu @ utsa.edu
- Best way to reach me!
- Common questions should be posted at Blackboard forum. Put “CS3733” in the subject line

Grade Distribution

Homework and Programming projects (24%)
- Three projects/few homework may be expected
- Discussions are allowed but no code-copying/cheating
- Project demonstration may be required

Two Mid-Term Exams (20% each)
- Closed books, closed notes

One Final Exam (35%)
- May 9 (6pm – 8:30pm): fixed date and time
- Comprehensive, closed books, closed notes

Filling evaluation (1%)

Full attendance will get 10%, 90% attendance will get 5%, and 80% attendance will get 1% more on the final score.

Big Data and Parallelization

Contributions
- False Sharing Problems
- Detecting Memory Errors
- Deterministic Multithreading

General Information (cont.)

Required textbook:
- Operating System Concepts, by Silberschatz, Galvin and Gagne (SGG), 9th edition (older versions work)
- Unix Systems Programming (USP), by Robbins and Robbins

Operating System Concepts

UNIX SYSTEMS Programming
Grading Policy

- Final letter grade:
- Every project can turn in as much as two days late, but with 30% off.
- No late than two days submission, without prior consent.
- No early/makeup exam without university sanctioned excuse or prior consent.
- Zero tolerance on cheating!!
  - A direct fail on the plagiarism on homework or project.

Course Objectives

- Better understanding of basic OS concepts;
- Learn the principles behind the design of operating systems;
- Discuss on "solved" and "open" problems in OS design and recent OS trends;
- Gain hands-on programming experiences
  - Multithreaded programming
  - Scheduling
  - Virtual Memory

Topics to be covered (and schedule)

- Introduction to OS (SGG Chapter 1)
- Programs and Processes (SGG 3.1, 3.2, and USP Chapter 2)
- CPU Scheduling (SGG 5.1-5.3, 5.6)
- Processes in UNIX (USP Chapter 3)
- UNIX I/O (USP Chapters 4, 5 and 6.1-6.4)
- The Token Ring (USP 7.1 – 7.3)
- Threads (SGG Chapter 4 and USP 12.1-12.2)
- Threads (SGG Chapter 4 and USP 12.1-12.2)
- Process Synchronization (SGG Chapter 6)
- Monitors and signals (SGG 6.7, USP 8.1-8.6, and 9.4)
- Network Communication (USP Chapter 18)
- Memory Management (SGG Chapter 18)
- Virtual Memory (SGG 9.1-9.4)

What you can expect from this course

- No much coding examples
  - No way to describe the OS implementation in this course
  - CS4853/CS5463 instead.
- Not an easy course.
- You will expect significant amount of workload

1st Homework (no credit)

- Change email on Blackboard to your favorite email:
  - For future important notices etc;
  - Get used to Blackboard system