CS5523: Operating Systems

Basic Information

Instructor: Tongping Liu
Email: Tongping.Liu@utsa.edu
Class Time: Tu/Th, 7:30pm-8:45pm
Class Room: NPB 1.226
Office: NPB 3.328
Office Hours: TuTh 4pm–5:15pm (NPB 3.328)

Course Description:
This course covers the principles of operating systems theory and practice as well as distributed operating systems. Fundamental concepts such as processes and threads, synchronization and concurrency, memory management, communication, remote method invocation, security, distributed file systems and name services will be presented. The principles and implementation of the software necessary to manage system resources in a distributed environment will also be addressed. A core knowledge of basic operating systems concepts, such as process/IPC, virtual memory and I/O, are assumed and will be reviewed. You will be programming in C/C++ and/or Java.

Course Objectives:

• Enhance the understanding for the key operating system concepts (such as process, thread and memory management);

• Develop an understanding of distributed systems and the important issues in their design;

• Develop a working knowledge of the infrastructure required to support distributed systems (inter-process communication and internetworking);

• Understand how applications are evolving to use distributed system support;

• Improve system-development and technical writing skills;

• Learn and/or improve team work and oral discussion skills;

Text Books

–Required textbooks:

• Distributed Systems: Principles and Paradigms, 2nd edition. by Andrew S. Tanenbaum and Maarten Van Steen (TS);

• Operating System Concepts, by Silberschatz, Galvin and Gagne (SGG);
Recommended textbooks:

- Distributed Systems: Concepts and Design 4th ed. by G. Coulouris, J. Dollimore and T. Kindberg (CDK);

Prerequisites:

- CS 3733 or equivalent: Undergraduate operating systems;
- CS 4753 or equivalent: Undergraduate architecture;
- Graduate standing or granted before;
- In order to be able to work on the programming projects, the students must be comfortable with Java and C/C++ programming languages;
- If you have not met ALL of these prerequisites, please talk to the instructor.

Topics:

- Process and memory management: SGG Chapters 3, 5, 8, and 9
- Thread and Synchronization: SGG Chapters 4, 6 and 7; and TS Chapters 3 and 6
- Distributed System models: TS Chapters 1 and 2
- Networks and communication: TS Chapter 4 (and CDK Chapters 3 and 4)
- Distributed Objects: TS Chapter 10 (and CDK Chapter 5)
- Name Services: TS Chapter 5
- Fault Tolerance: TS Chapter 8
- Security: TS Chapter 9
- Distributed File Systems: TS Chapter 11
- Advanced OS Topics (if possible)

Grade Policy:

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<th>Component</th>
<th>Percentage</th>
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<tr>
<td>First Midterm</td>
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<td>Second Midterm</td>
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<td>Final</td>
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<td>Projects &amp; Assignments</td>
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<td>Participation</td>
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Note on participation: evaluation - 1 point, asking/answering questions on classes and forums - 2 points, quiz - 2 points.

Final Grade Distribution:
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<th>Grade</th>
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Course Policies:

- **General**
  - Exams are closed books, closed notes.
  - No makeup will be given except with university sanctioned excuses.

- **Project Assignments**
  - Project assignments should be finished independently but can be discussed. **Borrowing** and **providing** solutions are considered to be plagiarism and will be reported. Also, they will result in a **FAIL** in this course.
  - No late submission of projects will be accepted **except with prior instructor consent**.

Common Syllabus Information:
http://provost.utsa.edu/syllabus.asp

Common Questions about the course, assignments or exams:

Please post those questions in the “HelpForum” of Blackboard system since other students may have similar questions. It is not efficient to answer those questions one by one. However, you are welcome to send me personal questions, where the rule is further discussed in the following.

Sending Emails:

I will receive tons of emails everyday. Thus, please put the keyword **“CS5523”** and your **ABCid** in your email subject or body so that I can find corresponding emails very quickly. **Those emails without the keyword “CS5523” will not be answered!!**