CSE 5343/7343
Operating Systems
Syllabus
Spring 2013

Instructor:
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Class web site: http://www.lyle.smu.edu/~coyle/cse7343

Course Overview
An operating system (OS) is software (programs and data) that runs on computers and manages the computer hardware, providing common services for efficient execution of applications. The class will cover an overview of hardware concepts necessary to understand the workings of an OS. We will then study examples of operating systems including: CP/M, Windows, Mac OSX, Linux, and Google Android. Topics will include operating system data structures, processes, threads, memory management, files, IO, networking and security, cloud computing.

Prerequisites
You are expected to have basic programming experience in some high level language (Java, C++, PHP, etc.) and a basic working knowledge of Java. There are several assignments that will require programming.

Text

Grading
• Exams (3) 60%
• Programming Assignments 20%
• HW/Quiz/etc 20%

Exams
There will be three non-cumulative exams during the semester.
Exam dates: Exam1=Feb 26; Exam2=Apr 2; Exam3=May 2

There will be no final exam.
Programming Assignments
There will be three programming assignments of moderate complexity. You may use either C/C++, Java or
the language of your choice. Programming assignments will count 20% toward the final grade. Program
submissions should be documented.

C/C++ programmers: see Google Coding Guidelines:
http://google-styleguide.googlecode.com/svn/trunk/cppguide.xml

Java programmers should follow Scott Ambler’s guidelines:
http://www.ambysoft.com/downloads/javaCodingStandards.pdf. Short version is at:

Homework/Quizzes/etc

1. announced quizzes
2. online quizzes
3. end of class – open notes quiz
4. homework problems
5. short programming exercises
6. presentations (Pecha Kucha/ Ignite)

Each of the above will have equal weight. The average will be weighted 20% toward the final grade.

Final Grade Calculation:

• A : 93-100
• A- : 89-93
• B+ : 85-89
• B : 80-85
• B- : 75-80
• C+ : 70-75
• …

Class Participation is encouraged.

Blackboard vs. Web Page

• We will use blackboard for announcements, handouts, online discussions and assignment
submissions.
• Assignments will have deadlines but you can always submit after the deadline. Blackboard will be set
up to allow you to submit three times to a link. The most recent submission will be graded (unless
after a version has been graded).
• Distance Students may sometimes have a different deadline of 1-3 days.

The class webpage at http://lyle.smu.edu/~covle/cse7343 will be used for related resources and video links.
1:
Use your Linux directory skills to outline the directory structure of two of the Linux servers at SMU. For each server, create a hierarchical tree diagram showing the root directory and all the sub directories. Compare and contrast differences in the structures. Visit the website http://www.genopro.com/ for a tool that will be helpful in plotting the directory structure

Programming Assignments
1. Networks and Sockets
2. Virtual memory simulation
3. Threading Santa

Homework & Presentations
One of THE most important capabilities for SMU grads is written and oral communication. To help you improve your communication skills, various readings and/or videos will be assigned. After reading/viewing, in-class students will be selected at random to give a short (3 minute) non-powerpoint, oral summary using only a white board. Distance students will be asked to write a summary of approximately 250 words and submit via blackboard.

Computer Facilities & Software
All students should have an account on the SMU Lyle Linux servers. You are expected to able to login to one of the SMU servers, upload files via FTP and use Telnet to access command line functionality. The recommended software for FTP is WINSCP (http://winscp.net/eng/download.php). The software for Telnet access is PuTTY (http://www.putty.org/). Both are freely available on the web for download.

Class participation
For in-class students, class participation means being focused and attentive in class and asking and answering questions. Laptop gazing during class is discouraged.

For distance students, class participation means participating in class discussion boards, asking and answering questions.

Blackboard vs. Web Page
We will use blackboard for announcements, handouts, online discussions and assignment submissions. The class webpage at http://lyle.smu.edu/~coyle/cse7343 will be used for related resources and video links.

Asking Questions
It is OK to email the instructor questions. However, you should attempt to get your question answered on the class discussion board first. There will be a discussion group set up on Blackboard for each assignment. If you have assignment-related questions, please check if your question has been answered on Blackboard before posting your question.
There is an art to asking questions on the Web. The following is from http://www.catb.org/esr/faqs/smart-questions.html

**Before You Ask**

Before asking a technical question by e-mail, or in a newsgroup, or on a website chat board, do the following:

1. Try to find an answer by searching the archives of the forum you plan to post to.
2. Try to find an answer by searching the Web.
3. Try to find an answer by reading the manual.
4. Try to find an answer by reading a FAQ.
5. Try to find an answer by inspection or experimentation.
6. Try to find an answer by asking a skilled friend.
7. If you're a programmer, try to find an answer by reading the source code.

When you ask your question, display the fact that you have done these things first; this will help establish that you're not being a lazy sponge and wasting people's time. Better yet, display what you have *learned* from doing these things. We like answering questions for people who have demonstrated they can learn from the answers.

**C++ Google Coding Guidelines**

http://google-styleguide.googlecode.com/svn/trunk/cppguide.xml
Topics and Exam Schedule

Part 1

- The Evolution of the OS; CP/M – BIOS
- Processes and Threads: Thread states – the Process Control Block (PCB)
- Process Scheduling; FCFS – SJF
- EXAM 1: Feb 9

Part 2:

- Threads & Concurrency: joins – locks & synchronization – notify & wait
- Deadlock and deadlock avoidance
- Dining Philosophers
- EXAM 2: March 1

Part 3:

- Memory Management
- Virtual Memory
- Real Time Systems
- EXAM 3: Mar 29

Part 4:

- Networks and Distributed Systems
- Security
- Virtualization and Cloud Computing
- EXAM 4: Apr 26 (Last day of class)