COP 6611-001/3/7 Operating Systems
Syllabus, Spring 2017

When: M, W 9:30a.m.-10:45a.m.
Where: ENB 118
Instructor: Larry Hall, lohall at mail dot usf dot edu
Office: ENB 330
Office Hrs. M,W 11am-12p.m., T. 2-3p.m. or by appointment.
Phone: 974-4195
TA: Alireza Chakeri, Office Hrs Tu ,Th from 10:30 AM - 12 PM at ENB 329 or by appointment, chakeri@mail.usf.edu
Web page for class: `http://www.cse.usf.edu/~lohall/cop6611/`

Grading: There will be two midterms. The first will count 20% and the second will count 25% of the final grade. The comprehensive final will make up 30% of the final grade. There will be four programming projects which will involve experiments within the UNIX operating system. These programs will involve cooperating and distributed processes. The projects, quizzes, and homework will count for 25% of the final grade.

Grading scale: A $\geq$ 90, B $\geq$ 80, C $\geq$ 70, D $\geq$ 60, F <60.
General: The textbook is: *Operating Systems Concepts, Ninth Edition*, by Silberschatz, Galvin, and Gagne published by John Wiley and Sons. For the projects you may want a book on C programming. It is expected that students in this class have basic prior experience with operating systems either through programming or undergraduate instruction. Each topic should be read about in the book, before the lecture which pertains to it. **No late work is accepted**!! Any academic dishonesty will result in an F in the course. Programs must be individual and no help may be received or given without acknowledgment.

Topics:

Week 1: Chpts. 2, 3.1-3.4	OS structure, Processes, Inter-process communication
Week 2: Chpt. 3.5-3.7, 4.1-6	Communication in client-server systems, Threads
Week 3: Chpt. 6	CPU Scheduling
Week 4: Chpt. 5.1-5.6	Critical Sections, Process Synchronization, semaphores
Week 5: Chpt. 6.7-11, 7.1-7.2	Classic problems, Monitors, atomic trans., Deadlocks
Week 6: Chpt. 7.3-8, 8.1-8.4	Deadlocks, Memory management basics and Test 1
Week 7: Chpt. 8.5-89, 9.1-9.7	Paging, Segmentation and Virtual Memory
Week 8: Chpt 9.8-9.11, 11, 12.1-3	Memory, File systems implementation
Week 9: Chpt. 12.4-10,10.1-3	Files, Mass Storage
Week 10: Chpt. 10.4-9, 13.1-3	Disks, I/O Systems
Week 11: Chpt. 13.4-8	I/O Systems
Week 12: Chpt. 17.1-17.4	Test2 and Dist. Systems
Week 13: Chpt. 17.5 - 17.10	Dist. OS systems and Networking
Week 14: Chpt. 14	Protection
Week 15: Chpts. 15 and 16	Security and Virtual Machines

Final Wed. May 3: 7:30a.m.-9:30a.m.

Course Objectives:

1. Further an understanding of the principles of operating systems.
2. Develop insight into process management and scheduling issues.
3. Understand memory management operation.
4. Develop an understanding of file system implementation and of multiple levels of hardware support and management.
5. Develop a deep understanding of the concepts of cooperating processes, including communication, synchronization, and deadlock (detection and avoidance).
6. Be able to evaluate operating system features.
7. Develop an understanding of the distributed operating system environment.

Piazza:
This term we will be using Piazza for class discussion. The system is designed to get you help fast and efficiently from classmates, the TA, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza.
For distance learning students there is information on Blackboard Collaborate (which streams the class live, as well as being recorded for later use) at
http://www.usf.edu/atle/technology/blackboard-collaborate.aspx.

Projects and Projected Due Dates.

1. Implement a critical section solution by modifying given C code using a workable solution (like mutex locks).
   Assigned Feb. 8 due Feb. 13.
2. Modify the first solution by using semaphores to access the critical section. Compare the CPU time of the 2 approaches. To be assigned Feb. 13 and due Feb. 20.
3. Use semaphores to implement the n reader, 1 writer problem. Keep track of the wait time for each process. Assigned Feb. 22 and due Feb. 29
4. Create a message server using sockets. Assigned April 5 and due April 12.