CSCI 509 – Operating Systems
Fall 2021

Time: MTWF 11am

Place: CF 227

Instructor: Phil Nelson

Office/Phone: CF467, 650-3035

Web: https://facultyweb.cs.wwu.edu/~phil

E-mail: phil@wwu.edu

Office Hours: MTWF 2:00pm - 3:00pm, others by appointment. If you send me e-mail, please use plain text (no HTML please) messages and include “CSCI 509” in the subject of your e-mail to help your e-mail not be classified as spam. Check canvas for a zoom office link if you need to meet via zoom.

Web Access: I have information for this class on the web. As they are assigned, I will put a copy of each assignment on the web. See the page
https://facultyweb.cs.wwu.edu/~phil/classes/f21/509 Other information will be provided via the web. If you see something missing from the web site, please let me know about it via e-mail.

Coding Standards: https://facultyweb.cs.wwu.edu/~phil/classes/coding


Description: This class will give the student an understanding of internal workings of operating systems.

Outcomes: On competition of this course, students will demonstrate:

- Thorough understanding of process scheduling and the system implementation of multi-threaded applications.
- Thorough understanding of memory management techniques in operating systems.
- Thorough understanding of the implementation of file systems and device control.
- Basic understanding of distributed system management.

Graded Work: 3 Tests and Assignments.
Tests: The all tests will be given in-person during class time or the scheduled final time. Test one is on Friday, October 15. Test two will be given on Friday, November 5. The final will be given at the regular final time of 8:00 AM on Wednesday, December 8, 2021. Each test will be worth 15% of your final grade. To pass this class you must get at least 50% of the test points.

Assignments: The assignments will be both written and programming. All points will go into a grand total for the assignments. These assignments will be worth 55% of your final grade. Assignments will be listed on canvas with content of assignments on the web. Assignments MUST be turned in on canvas to be considered turned in. Assignment due dates are currently scheduled for October 1, October 12, October 19, October 27, November 3, November 17 and December 3.

Late Work: Work is due at the beginning of class on the day due. Work will be accepted up to TWO class periods late, at which time the work will be worth 75% of the original value. A late final assignment is worth 75% of the original up until the start of the final test. Canvas will be set up to accept late work until the deadline.

Grading: Grading is done by a percentage of the top score. The following is an example grade scale.

A: 100% – 90%
B: 89% – 80%
C: 79% – 65%
D: 64% – 50%

Collaboration: Each student MUST do their own programming. Original work is required. Assume you should not see the source code of any other student, past or present. You may discuss problems using diagrams on scratch paper, but you should not see source code. Even helping a fellow student debug their program so that source code is seen should be avoided. Students having problems should e-mail me or visit me in my office.

Cheating: Is (obviously) not allowed. If you do cheat and are caught you will receive an F as your grade for the class. This includes ALL students knowingly involved in any cheating event. Not properly protecting your source code may be considered knowingly involved. I may use mechanical means to compare student programs. These comparisons are used to raise the possibility of cheating, but all decisions about cheating will be made by me after inspecting the programs of all students involved.
Final Assignment: Your final assignment will be due on December 3, 2021, the last class of dead week. A late final assignment will be worth 75% of its original value until the start of the final test.

Western Syllabus Policies: For generic syllabus policies of Western, visit https://syllabi.wwu.edu

Outline of Course: Expected order:

- Introduction to OSes
- Basic OS structures
  - Services
  - System calls
  - Operating System Structure
  - Virtual Machines
  - System Boot
- Processes
  - Process abstraction
  - Process scheduling
  - Interprocess Communication
  - Threads in the OS
  - Implementation of threads
  - Synchronization
  - Deadlocks
- Memory Management
  - Main Memory
  - Swapping
  - Paging
  - Virtual Memory
  - VM implementation and issues
- Storage Management
  - File systems
  - Kernel File System Structures
  - FS implementation
  - Mass storage
  - I/O systems
• Protection and Security
  – Protection Goal
  – Protection Methods
  – Security issues
  – Security techniques
• Introduction to Distributed Systems
  – Basics of Distributed Systems
  – Subsystems of DS
  – Basics of Distributed File Systems
• Other OS topics as time allows