UNI CS 3430 (Spring 2015)
Operating Systems

Course Syllabus (Version 1.0)

Contact Information

Instructor
Sarah Diesburg (diesburg@cs.uni.edu)
Office: 311 ITTC
Office hours: MWF 1:00pm-3:00pm and by appointments
Lecture: MWF   11:00am-11:50am   ITTC 328
Class website: http://www.cs.uni.edu/~diesburg/courses/cs3430_sp15/index.htm and
                UNI eLearning

Objectives

- Define, explain, and apply introductory operating systems concepts: process management, inter-process communication, memory management, I/O systems, file systems, and the like
- Use the UNIX operating system interface to implement a user-level shell in the C language
- Design and implement a correct concurrent program requiring synchronization
- Gain experience in implementing and debugging operating system components, including the kernel module, system call, synchronization primitives, and the file system

Prerequisites

- CS 1410 Computer Organization
- CS 1520 Data Structures
- CS 1800 Discrete Structures
- Junior standing or above
- Working knowledge of the UNIX programming environment
- Proficiency in C or other high-level programming language

Course Material

- Lecture notes (posted on the class Web site)
- UNI eLearning website for all other materials
- Required textbooks:
  - Silberschatz, Galvin, and Gagne, *Operating System Concepts*, 9th Edition (ISBN 978-1118063330)

Class Grading

The following coursework components contribute to your final grade, and to the degree shown:

Projects	45%
Weekly Exercises	0-5%
Attendance	5%
Exam 1	10%
Exam 2	10%
Final Exam	20-25%

There will be three to four increasingly challenging projects due during this course. For many projects, you have the option of working in teams of two people.

Weekly exercises will consist of short-answer questions, essays, or problems. The purpose of these exercises is to prepare you for exams. From time to time, I may ask you to turn in work done on weekly exercises if I see they are not being done.

For the projects, if you receive help from others, or if you find helpful information from various sources, please include appropriate acknowledgements. However, copying code from another classmate is never ok (see section below on scholastic conduct).

The final exam will be comprehensive.

To receive a passing grade for the overall course, you must earn a passing grade on the final exam and a passing grade on the combined projects.

The grading scale is as follows:

100 – 92	A	69.9 – 68	D+
91.9 – 90	A-	67.9 – 62	D
89.9 – 88	B+	61.9 – 60	D-
87.9 – 82	B	59.9 – 0	F
81.9 – 80	B-		
79.9 – 78	C+		
77.9 – 72	C		
71.9 – 70	C-		

Late Submission Policy

Late projects solutions will incur a 10-point deduction each day the project is late. Project solutions received after two days from the original due date will receive 0 points. For example, an project solution submitted anytime on the Monday after the original due date of Friday will receive 0 points.

Computer Accounts

You will need CatID credentials to access the eLearning website.

Make sure you are checking your UNI emails. Important class announcements will be sent frequently from the eLearning interface to your UNI email account.

You will also be receiving specialized login accounts to a class-specific programming server. More details to be announced in class.

Your Responsibilities

- Understand the lecture slides and reading exercises
- Attend office hours for extra help, as needed
- Uphold academic honesty in completing your exercises, projects, and exams
- Turn in your projects on time
- Check the class webpage and your UNI email account regularly

Course Calendar (Tentative)

Date	Readings and pre-class assignments	Session Links and Announcements
1/12	Chapter 1	Session One -Introduction and History
1/14	Section 18.1	Session Two - Class Projects and Environment
1/16	C language tutorial	Session Three - C Examples
1/19	No Class - Martin Luther King, Jr. Day	
1/21		Session Four - Concurrency
1/23	Chapter 2	Session Five - From Raw Hardware to Processes
1/26		Session Six - Shell Parsing and Exec
1/28	Chapter 6	Session Seven - CPU Scheduling
1/30		Session Eight - Cooperating Threads and Synchronization
2/2		Session Nine - cd command and shell variables
2/4	Sections 5.1-5.2	Session Ten - Implementing Mutual Exclusion
2/6	No Class, Gone to ISU CDC	Use today to work on Project1
2/9	Sections 5.3-5.4	Session Eleven - Semaphores and Bounded Buffer
2/11	Sections 5.5-5.9	Session Twelve - More on Semaphores
2/13		Project Quiz and Review of HW 4
2/16		Session Thirteen - Exam 1 Review
2/18		Exam 1
2/20	Section 18.3	Recitation Fourteen - Intro to Linux Kernels
2/23		Session Fifteen - Monitors, Condition Variables, Readers-Writers
2/25		Session Sixteen - Deadlocks
2/27		Session Seventeen - Intro to Kernel Modules and /proc
3/2	Chapter 7	TBD
3/4	Sections 8.1-8.6	Session Eighteen - Concurrency Conclusion, Memory Protection
3/6		Session Nineteen - Locking and kthreads
3/9		Session Twenty - Address Translation
3/11		Class Period will answer Project 2 Questions
3/13		Session Twenty One - Caching and TLBs
3/23	Sections 9.1-9.6	Session Twenty Two - Virtual Memory
3/25	Sections 10.1-10.4, 13.1-13.3.2	Session Twenty Three - Device Management and Disk Management
3/27		Project 2 Quiz and Review of HW 8

Date	Reading	Topic
3/30		Session Twenty Four - Exam 2 Review
4/1		Exam 2
4/3		Session Twenty Five - File Systems
4/6	Chapter 11	Session Twenty Six - Naming and Directories
4/8		Session Twenty Seven - Boot Sectors, Files and Directories, File I/O
4/10		Session Twenty Eight - File Systems, FAT32, Endianness
4/13		Session Twenty Nine - Transactions and Reliability
4/15		Session Thirty - Boot Sectors, Files and Directories, File I/O (Cont.)
4/17		Session Thirty One - FAT32 Directory Entries, Project Operations
4/20		Continuation of session above
4/22	Chapter 15, Sections 14.4-14.7	Session Thirty Two - Protection and Security
4/24	Sections 17.3-17.5	Session Thirty Three - Network Protocols
4/27		Session Thirty Four - Distributed Systems and RPC
4/29	Section 17.9	Session Thirty Five - Distributed File Systems
5/1		Project 3 Quiz and Final Review
5/5	Final Exam 10:00-11:50am	

Course Policies

Attendance: The University requires attendance in all classes. I will be taking role randomly throughout the course as part of your attendance grade.

Missed exams: A missed exam will be recorded as a grade of zero. I will follow the university rules regarding all missed exams.

Scholastic Conduct: You are responsible for being familiar with UNI's Academic Ethics Policies (http://www.uni.edu/pres/policies/301.shtml). Remember, discussing assignments is good. Copying code or answers is not. Any copied code from a current or previous class member may result in a zero grade for the assignment up to an F for the course. All code will be checked with a plagiarism checker.

When using the eLearning discussion board, please do not post more than *one line* of code. Talk about the issue in plain English.

Accessibility: In compliance with the University of Northern Iowa policy and equal access laws, I am available to discuss appropriate academic accommodations that may be required for students with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances, so arrangements can be made. Students should register with Student Disability Services, 103 Student Health Center, to verify their eligibility for appropriate accommodations.