Lane Department of Computer Science and Electrical Engineering
CS 350
Computer System Concepts
Fall 2011
Time: T R 12:30 – 1:45PM
Room: ESB 207
www.csee.wvu.edu/~cukic/CS350

Instructor: Bojan Cukic
Office: ESB 731
Office Hours: T R 2:00 – 3:00 PM or by appointment
Phone: 304-293-9686
E-mail: Bojan.CukicATmail.wvu.edu (the preferred method for reaching me)
Prerequisite: CS 111.
Textbook:
• Silberschatz, P. Galvin, and G. Gagne, *Operating System Concept*s, John Wiley, Hoboken, NJ, 2005.

Reference Textbooks:
• Deitel and Deitel: *"C: How to Program"*, Prentice Hall, NJ, 1994, 2001.
• K. A. Robins, S. Robins: "UNIX Systems Programming," Prentice Hall, 2003.
• Partial class notes are made available at the Web (http://www.csee.wvu.edu/~cukic).

1. Class Objectives
Hardware and software are, broadly speaking, two primary subsystems in modern computers. The aim of this course is to provide an introduction to systems software organization, primarily the software-hardware interface provided by operating systems. In order to achieve this, the class provides an in-depth coverage of the programming language of choice for system level programming, C, an introductory coverage of principles behind operating systems, and the programming interface between C and Linux family of operating systems. The topics of interest include process management, interprocess communication, and an introduction to computer networks.

2. Expected Learning Outcomes
Upon successful completion of this course, students should have:
1. Ability to design and implement programs in programming language C.
2. Ability to use operating system interfaces: interrupts and system calls.
3. Ability to program run-time environments: processes, threads, synchronization primitives.
4. Ability to implement elementary networking (TCP, IP, client / server) and use inter-process communication primitives.

3. Topics Covered

WEEK #	
1, 2	System Abstractions, C Review, Static Data Structures, Functions, Recursion
3, 4	Pointers, Pointer Arithmetic, Parameter Passing by Reference
5	Binary File I/O, Binary Arithmetic
6, 7	Asynchronous Programming Concepts (interrupts, system calls), Introduction to operating systems (OS)
8, 9	Processes in OS, Inter-process communications (IPC).
10, 11	Process Synchronization, Semaphores and Pipes.
12, 13	Introduction to networking, OSI, TCP/IP
14	Sockets , Threads
15	The File System

4. Tests
There will be 3 tests during the semester and the final exam. Their tentative dates are:

- Test 1: The week of September 19th
- Test 2: The week of October 24st
- Test 3: The week of November 28th
- Final exam: *Friday, December 17th, 3-5 PM.*

The final exam will be comprehensive, that is, it will cover all the material taught throughout the semester.

5. Programming Assignments

There will be 3 programming assignments. You are advised to *start working on assignments well before the deadline*, in order to avoid delayed submission. Each day of delay will cost you 5% of the grade. Linux programming environment will be required for program development, execution and submission. You will be given class accounts on LCSEE Department's Linux cluster. Please note that a Linux server can be accessed from your homes using a secure connection service, such as SSH. All programming in CS 350 will be done in C (Java or C++ are not acceptable).

  • Required software: GCC compiler, SSH Secure Shell client.
  • Recommended software: any debugger, any text editor.

There is no lab associated with this course. Submitted programs will be compiled using GCC compiler (no exceptions). Detailed assignment descriptions will be given in class and made available on the class Web page. Tentative assignment dates:

  ➢ Assignment #1: Sept 1st to Sept 15th
  ➢ Assignment #2: Oct 3rd to Oct 20th
  ➢ Assignment #3: Nov 7th to Nov 18th

6. Grading

Tests and the final exam will account for 60% of the final grade. The remaining 40% will be derived from programming assignments. **You must obtain a passing grade (60% or higher average) in both parts (tests and assignments) in order to pass the course**. **THERE WILL BE NO EXCEPTIPONS TO THIS RULE**.

7. Expected workload

CS-350 is a hands-on course, and the expected workload is relatively high. You MUST be prepared to dedicate AT LEAST 5 working hours a week to this class (excluding the time spent in the classroom). A minimal prerequisite for the successful completion is good understanding of programming concepts (CS 111).

8. Academic Honesty

Students are encouraged to share discussions regarding class topics. **However, collaboration during the implementation of programming assignments, homeworks and tests is strictly forbidden. Also forbidden is downloading of solution programs from Internet. Please, be aware that your programs/homeworks/tests will be AUTOMATICALLY compared with each other during the evaluation. Assignments with non-accidental similarities will receive the grade zero (0%). Repeated offense will lead to an F in the class.**

9. Social Justice Statement

West Virginia University is committed to social justice. I concur with that commitment and expect to foster a nurturing learning environment based upon open communication, mutual respect, and non-discrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color or national origin. Any suggestions as to how to further such a positive and open environment in this class will be appreciated and given serious consideration.

If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangements with Disability Services (293-6700