

# CS3411 Systems Programming

## Course Syllabus

Instructor: Soner Onder  
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Office Hours: Friday 1:00-2:00  
Other times by appointment

### Prerequisites:

CS2141 - Software Development using C++  
CS3421 - Computer Architecture

### General Description:

This course will cover basics of systems programming in a UNIX environment. We will cover operation of fundamental elements of the UNIX operating system interface, as well as certain scripting tools commonly used to manage UNIX system software resources. Systems programmers develop programs that often run in a privileged mode, with unrestricted access to system resources, and that are fundamental to correct operation of the programming platform presented to users. A primary goal of the course then is to reinforce, in a systems programming context, the skills you have already acquired to develop code that is robust. The topics to be covered include:

Topic	Subtopics
Review	C language, make
UNIX file system interface	
Processes	
Linking and Libraries	
Interprocess communication	signals, pipes, sockets
Terminal I/O	
Time and Timing	
TCL/TK	(as time allows)

**Course Text:** There is no required course text. Overheads will be distributed and, together with class notes, are expected to provide adequate information for completion of the programming projects and in-class tests. The following reference books may be helpful.

- *C: A Reference Manual*, Fifth Edition, by Samuel P. Harbison, III and Guy L. Steele, Jr.
- *Advanced Programming in the UNIX Environment*, by W. Richard Stevens
- *UNIX Network Programming, Volume 1- Networking APIs: Sockets and XTI*, Second Edition, by W. Richard Stevens

## Grade Determination:

The course grade will be comprised of the following components.

70 % **Programming Projects** - Programming projects (probably five) will comprise the most significant portion of the course grade.

30 % **Tests** - There will be two in-class tests. The tests will be equally weighted.

**Homework:** Homework will be assigned, but will not be graded. The goal of the homework assignments is to prepare you for the in-class tests.

**Programming:** The grading criteria for submitted projects includes readability, robustness, and efficiency. Correct operation on normal input will not achieve an A grade. Submitted programs are expected to terminate normally under reasonably foreseeable errors in user input and are expected not to contain gross inefficiencies in resource usage.

Over the course of the semester, you may have five *slip days*. Each person is given an automatic extension of five calendar days, which you can use on any programming project during the semester, in any increment, as long as the total amount of lateness does not add up to more than five days. For instance, you can hand in one program five days late, or two programs two and three days late respectively. When you hand in a program, you must identify at the top of the assignment, (i) how late this assignment is, and (ii) how much of the total slip time you have left. Each **calendar** day that passes beyond the due date counts as a slip day. Slip days are used in increments of days, not hours. If an assignment is submitted one hour after the due date, a slip day has been used for that assignment. Once the five slip days have expired, projects can be submitted at a penalty of 20% per day. No slip days can be used beyond the last day of classes, and no projects will be accepted after the last day of classes.

Programming projects are to be performed individually. You may neither show anyone your project code nor look at the code of anyone else. (This policy extends to any external resource, including code found on the web or individuals who are not enrolled in the course.) However, you may engage in *empty hands* discussions with anyone. No participant in an empty hands discussion should leave with written or printed material he/she did not enter the conversation with. If you are unsure whether or not a particular type of collaboration is allowed, you are expected to check with me *before* engaging in the collaboration.

## Notes:

- Attendance will not be taken.
- A course web page will be maintained at <http://www.cs.mtu.edu/soner/courses/cs3411/Home.html>. This page is maintained only **as a convenience**. Class attendance is expected/assumed. In the event of a conflict, information given during class supersedes any contained on the web page.