

# CS 631 Advanced Programming in the UNIX Environment Syllabus

The syllabus below describes a recent offering of the course, but it may not be completely up to date. For current details about this course, please contact the course coordinator. Course coordinators are listed on the course listing for undergraduate courses and graduate courses.

## Text Books

### Required

W. Richard Stevens, Stephen A. Rago , *Advanced Programming in the UNIX Environment* , Third Edition, Addison Wesley Professional, 2013

### Recommended

Brian W. Kernighan and Dennis M. Ritchie , *The C Programming Language* , Prentice Hall, Inc., 1988; ISBN 0-13-110362-8 (paperback), 0-13-110370-9 (hardback). Important: make sure you get the 2nd Edition covering ANSI C.

Brian W. Kernighan and Rob Pike , *The Practice of Programming* , Addison-Wesley, Inc., 1999; ISBN 0-201-61586-X

## Week-by-Week Schedule

Week	Topics Covered	Reading	Assignments
1	Introduction, UNIX history, UNIX Programming Basics	Stevens ch 1, 2	Homework 1: read code
2	File I/O, File Sharing	Stevens ch 3	Homework 2: trivially copy a file
3	Files and Directories	Stevens ch 4	Midterm project assignment
4	Filesystems, System Data Files, Time and Date	Stevens ch 4, 6	
5	Process Environment, Process Control	Stevens ch 7, 8	
6	Process groups, sessions, signals	Stevens ch 9, 10	
7	Interprocess Communication	Stevens ch 14	
8	Advanced I/O: Nonblocking I/O, Polling, and Record Locking	Stevens ch 14	Homework 3: final group project: write an HTTP server
9	Daemon Processes, Shared Libraries	Stevens ch 13	
10	UNIX tools: make(1), cvs(1), diff(1), patch(1), gdb(1)	CVS documentation; Debugging with GDB; Guide to Faster, Less Frustrating Debugging; gdb tutorial	
11	HTTP protocol; code reading: server implementations	Source code of common HTTP servers	Homework 4: final project milestone; practical exercise: set up and analyze different HTTP server implementations
12	Code reading / presentation	Student code	
13	Implementing encryption using OpenSSL; TLS/SSL concepts		In-class exercise: write an encryption utility
14	Review	All material	Final assignment: write a shell