CS 15-123
Summer 09
Effective Programming in C and UNIX
Course Syllabus

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Course Description: 15-123 Effective Programming in C and UNIX
All Semesters: 9 units
This course is designed to provide a substantial exposure to the C programming language and the Unix programming environment for students with prior programming experience but minimal exposure to C. Features of the C language that are emphasized include arrays, structs and unions, dynamic memory allocation (malloc and free), pointers, pointer arithmetic, and casting. Data structures that are emphasized include lists and hash tables. Students will develop a sense of proper programming style in the C idiom, and will be exposed to cross-platform portability issues. Students will learn to use tools such as emacs/vi, make, and gdb to assist them in the design, testing and debugging of their programs. Students will learn about regular expresions and grep and will be able to use a scripting language such as Perl to solve simple problems. This course serves as the prerequisite for 15-213.
Prerequisites: 15100

Course Objectives: This primary objective of this course is to prepare students for 15-213 which in turn prepares them for operating systems and distributed systems and other systems courses. We will use the C language (old fashioned C not C++) to teach the basics of pointers, memory addressing, copying and moving memory, and other fundamental system tasks. We move off the Windows platform to the AFS (Andrew File System) here at CMU. On AFS we will use the gcc compiler and it's debugger gbd. The use of simple make files will also be taught. I assume that you have taken at least one programming course and you are either a CS major and/or you are going on to 213 or beyond. As such the depth and rigor of the course will be more than a typical intro course.

Primary Course Text Book:
(1) C Programming Language (2nd Edition)
by Brian W. Kernighan (Author), Dennis Ritchie (Author)

Other Recommended Text Books:

(1) "C for Java Programmers" by Thomasz Muldner" ISBN: 0-201-70279-7 - Addison Wesley Longman 2000

(2) ANSI C on UNIX by Paul Wang http://www.sofpower.com/pub_bk01.html

(3) **Learning Perl, Fourth Edition** by Randal L. Schwartz, Tom Phoenix, brian d foy Fourth Edition July 2005 http://www.oreilly.com/catalog/learnperl4/

(4) The UNIX programming Environment by Kernighan and Pike
http://cm.bell-labs.com/cm/cs/upe/

Assignments and Exams: Assignments will be challenging and you will have to solve them independently. Debugging C programs are much harder than debugging Java programs. Therefore you may need more than few hours to complete the assignments. You need to start early and ask questions. Some assignments may occasionally contain an element of mathematics. There will be a programming midterm and a written midterm, covering concepts.

Programming Assignments are usually released on Monday and are due the following Saturday at 11:59pm. No late work is accepted without a valid medical excuse. If you are not done - hand in what you have. You'll get partial credit for what you have completed. You can use 3 total late days for the entire semester for ANY reason. No questions asked. You *cannot use more than one late day per assignment*. Don't ask for extensions unless you have a valid documented excuse. Use one of the late days. To make the management of the course grading easy, your programs will be graded as usual (max full credit if submitted on time, 50% off if 0-24 hours late. 80% off if 25-48 hours late. No grading after 48 hours). At the end of the course you can trade late days for late penalties.

Skills Labs: There will be in class skills labs on Fridays as listed in the course schedule. The skills labs are short assignments that often emphasize things related to assignments or other important concepts. These labs need to be completed in class or must be submitted no later than the deadline. Skills labs will be graded out of 10 points.

handin/handback System: All assignments are submitted through the AFS handing system. You must attend the first recitations to learn how to submit the labs through AFS handin system. You can also stop by my office during office hours if you'd like. You submit your assignments to handin folder and a txt file with comments will be in the handback folder. Handin folder will be closed after the deadline, any late programs must be directly sent to your TA for grading. Please include a note indicating if you are planning to use a late day and/or penalty for that assignment. No programs are accepted after 48 hours. We will grade the program asap and leave a txt file with comments in the handback folder. Your grade will be posted on Bb and class will be notified that grades are available for that particular assignment. You have ONE WEEK to discuss your grade with TA. No grade will be reconsidered one week after the grade is released.

Exam Dates: There will be two midterms given on the 4th week (written test) and 5th week (programming test) of classes. In the programming exam, you need to complete a given task or two within 80 minutes. You will be given starter code and will be asked to complete the code, compile, run, debug and submit within 50 minutes. The written exam will test your understanding of basic C concepts and questions will be similar to what is discussed during lectures. Final exam is a 2 hour written/programming exam. No alternative make up dates can be scheduled without a valid medical excuse, school sanctioned activities (i.e. you are a member of the football team and you have a game that day), or other extenuating circumstances. If you want an alternative exam date you must notify me 1 week in advance. Sleeping in is not an extenuating circumstance.

Office Hours and Getting Help:

During my office hours you can stop in any time without an appointment. Any other time, you need some help 5-10 minutes, just stop by. If I am in I will be happy to help out. If you can't stop in during office hours please call or email me to make an appointment at some other mutually convenient time.

Caveat: If you are attending class regularly I will make every effort to accommodate extra office hours to help you. But, if you are not attending, or attending very sporadically, I will not make time for you outside of normal office hours. Please attend class. If you don't need to attend you probably should not be in the course. I cannot emphasis enough how important it is for you to ask for help as soon as you realize you do not understand a topic.

Course Assistants are here to help you. Email them and make appointments to meet and discuss the assignment. Be warned your TAs will NOT write code for you. They will explain the assignment and the theory behind it. They may suggest coding strategies and point you to help in your text but they will not write code for you. You must make the transition from thought to code.

Grading Policy:

Assessment	Weight
Programming Midterm	10%
Written Midterm	10%
Quizzes	10%
Skills Labs	10%
Programming Assignments	40%
Final Exam	20%
Total	**100%**

Percentage	Grade
>= 90%	A
>= 80%	B
>= 70%	C
>= 60%	D
< 59%	**R**