Essentials: Communication, Content, and Structure

Communications

Class Meetings:	Monday, Wednesday 19:00 - 20:15
Office:	HN1090J
Office Hours:	Wednesdays 15:30 - 17:30.
Email:	stewart.weiss@hunter.cuny.edu
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Resources

Textbooks: Bruce Molay. Understanding Unix/Linux Programming. Prentice Hall, 2003. ISBN 0-13-008396-8.

Computing Facilities: All registered students will be given user accounts on the Computer Science UNIX network unless they already have one. These accounts provide access to all UNIX hosts in the network, including those in the 1000G lab on the tenth floor of Hunter North. This lab is available 24 hours a day, 7 days a week, to students enrolled in selected courses. The accounts also enable students to remotely login to the network using an ssh client.

Website: All course materials, including lecture notes, slides, assignments, syllabi, and other resources, including this document, are posted on my website, at `http://www.compsci.hunter.cuny.edu/~sweiss/course_materials/csci493.66/csci493.66_spr12.php`

Prerequisites

If you have not had CSci. 340, you will not be permitted to take this class unless there is reason to believe that you are ready in spite of the lack of the prerequisite.

Departmental Learning Goals

Material in this course supports or partially supports the following departmental learning goals: 1b: (understanding the relationship between computer architectures and software systems) by analyzing the relationship between kernel features and the machine architecture; 2c: (ability to apply principles of design and analysis in creating substantial programs and have experience working in teams on projects of moderately realistic scope); 3a: (ability to communicate ideas effectively) by requiring homework that is graded in part on clarity and proper use of the English language.

Course Objectives and Content

The principal objectives of this course are to teach you

- how to write programs on and for a UNIX platform,
- how to work efficiently within the UNIX environment, and
- how UNIX is designed and structured.

It presents three different perspectives of the UNIX operating system:

- for the application developer, it examines important parts of the UNIX operating system's application programming interface (API);
- for the ordinary user, it examines the command level view of UNIX; and
- for the computer scientist, it explores the internal structure of the UNIX operating system.

The course is primarily about system programming. In particular, it covers the following parts of the kernel API: general I/O structure, device and terminal control, the file system interface, process and thread management, signals and inter-process communication methods. It also covers a bit about event driven programming and the curses library.

This course devotes a small amount of time to shells and UNIX tools, and significant emphasis on system programming, in spite of the title of the course[1]. Over the years, many of the students who have taken this course and graduated have contacted me afterwards to tell me that it was this course that landed them their first jobs.

About C and C++ in This Course

Most of the programming examples that I use and that appear in the textbook are written in C. Some students have a knee-jerk reaction when they hear this, thinking, "but I don't know C." This is not quite true. The C++ language contains most of the C language. If you know C++, you know a great deal of C. There are minor differences that arise in the syntax of declarations (such as struct and function declarations), but the real problem is that most students never learn how to use the C standard I/O library. Most students learn C++ stream I/O and never bother to learn the seemingly archaic functions of the C standard I/O library. These functions are at times much more useful than any found in C++. In general, you ought to know some C, if you want to call yourself a programmer. While you are free to write C++ code, you will be required to read C code in this course.

Assignments, Exams, and Grading

This is an honors seminar, not an ordinary lecture-style class. For this reason, students are expected to be self-motivated and self-disciplined, and are expected to do all of the assigned reading. The final grade is based upon a weighted average of the following components: class participation (5%), project grades (75%), self-tests (10%), and the final exam (10%).

Assignments. There will be four or five assignments, of varying sizes. In all cases, the work is to be yours alone; working in groups is not allowed, unless the assignment states otherwise. Assignments must be submitted on time. *Assignments that are not submitted on time will lose 20% off the top per day, and will not be accepted more than three days late.* This means, for example, that a perfect assignment that is two days late will receive 60 points instead of 100. Programs must also comply with the rules specified in the document `http://www.compsci.hunter.cuny.edu/~sweiss/course_materials/csci493.66/programming_rules.pdf`. Please read it carefully. The final project will require, in addition to proper in-line documentation, a five hundred word summary of the design and methodology, in compliance with a departmental requirement. Details will be provided with the assignment.

[1] The title of the course was supposed to be changed two years ago, but this task seems to have eluded attention

Self-Tests. There are nine self-tests that must be completed on-line. You must complete eight of the nine tests. Each is worth 1.25% of the grade. See the self-test instructions on-line for more details.

Final Exam. There will be a Blackboard-based, multiple choice, final exam at the end of the semester, during the regularly scheduled final exam period.

Incomplete Grades

I do not give "incomplete" (IN) grades except to those students who have completed all work on time and who, for legitimate, documented medical or personal reasons, miss the final exam. I will not give an IN grade to someone who has fallen behind on the projects and does not hand the last project in on time.

Class Calendar

The last day to drop a class without a "W" is February 16. The last day to withdraw is April 19. There are no classes on Monday, February 13, Monday, February 20, nor during the spring recess from April 6 through April 15. Tuesday, February 21 follows a Monday schedule, so we will have class on that day. The last day of class is Monday, May 14.

Programming and System Access

One choice is to use the 1000G lab, which is equipped with Fedora Linux workstations. This lab is open "24/7" and has 28 workstations. The advantage of this is that you will be sitting at the console of a Linux host and will not be subject to potential disconnections that can take place when working remotely. You will also be much less affected by network problems than if you connect remotely from outside of Hunter. The disadvantage is that you have to be in school to use it. When you are in the lab there are a few important rules that must be followed:

- Never power down a machine for any reason.
- Never leave a machine without logging out.
- Never use lockscreen to lock the screen in your login.

The other choice is to work remotely. The Computer Science Department makes a UNIX host, named

`eniac.geo.hunter.cuny.edu`,

available to students who have accounts on the network. You will be able to access this host from any computer that has *ssh* client software. Once you login to eniac, you are requested to login from eniac to one of the machines in the 1000G lab, named `cslab1` through `cslab28`. You cannot *ssh* directly to those machines from outside of Hunter College for security reasons.

There are several versions of *ssh*. *OpenSSH* is an open source version developed for the *OpenBSD* project. *PuTTY ssh* is a free version for the Windows operating systems, available at

`http://www.chiark.greenend.org.uk/~sgtatham/putty/.`

Macintosh computers come with a command-line *ssh* client.

Course Materials, the Web, Blackboard, and the CSci Network

All lecture notes will be posted on the course's home webpage, which does not require special privileges to access. Grades will be posted in the grade center on Blackboard. For the purpose of discussions and course-related questions, the class has a Google group with the following essentials:

Name:	`hc_csci493.66spr12`
Home page:	`http://groups.google.com/group/hc_csci493.66spr12`
Email address:	`hc_csci493.66spr12@googlegroups.com`

If you do not have a Google email address, you will not be able to post to this group, so I suggest that you obtain one. The Google group will be the means by which to ask and answer questions related to the course. I require that you use the following protocol if you have a question:

1. Check whether the question you want to ask has been posted and answered in the Google group.
2. If it has been answered, you are finished. If not, send the question to the Google group.
3. Anyone in the group can answer the question. If no one else answers the question, I will post an answer to it.

I will ignore any non-personal questions sent to my Hunter email address. Personal questions (such as a question about a grade or missing a class) should be sent via private email to my Hunter email address, not to the Google group.

All demo programs will be posted in the appropriate sub-directory of the directory

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/data/yoda/b/student.accounts/cs49366/demos/.
```

All students registered in the class will have permissions to access these directories, which are accessible from any computer on the department side of the firewall, such as the *Lab 1000G* computers. All assignments must be submitted to the appropriate subdirectory of

```
/data/yoda/b/student.accounts/cs49366/projects.
```

Academic Honesty

Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The college is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. In this class, I will enforce the University's Policy on Academic Integrity and bring any violations that I discover to the attention of the Dean of Students Office.