Instructor: S. Chaiken
       Office Hours: T, Th: 11:45PM-1:00 in HU-025
                   Wed: 9:30-11:00AM in LI-96H
                   other times drop-in if I'm not busy

Prerequisite: C grade or better in a CS2 Data Structures course (CSI310 at Albany): 2nd semester proficiency in C++ or Java programming, data structures, recursion, problem solving, program construction, testing and debugging. On October 1, I will DEREGISTER students who do not have the CS2 prerequisite except for those who demonstrate proficiency by submitting passing work in Projects 1 and 2. See that project assignment. If you have the prerequisite on your transcript and you CANNOT do passing work on such assignments, you will probably fail CSI333 because future assignments will involve much more new content and harder problems. See me for help on catching up in the next 2 weeks!

Teaching Assistants: Sean Spillane (sean@cs.albany.edu) and TBA Scheduled office hours will to be held in the lab room HU-025.

Required Texts:


   Reading assignments will be assigned for which in-lecture QUIZZES will be given.

   The first reading assignment, due Thursday (in two days) is Chapter 1 and the first Part of Chapter 2 of Patt and Patel’s book (P&P). The quiz on Thurs. will include some of the textbook exercises.

   There is also a short, 4-part written homework assignment due Thursday (in 2 days). See the Project 1-2 handout.

   The second reading assignment, due Tuesday, Sept. 4, is to finish Chapter 2 and to read Chapter 3, Section 3.3.1 (Decoder) or beyond.

   Chapter 3 should be finished by Sept. 7 or so, and Chapter 4 should be read in preparation for the lecture on Sept. 11. Note this class and its labs will not meet Sept. 12-14.

3. Your CS1-2 C++ or Java textbooks and/or other references for programming fundamentals.

4. Project assignments are written as software specifications, with pedagogical explanations and expositions. Every word on project assignments is required reading. The professor may refuse to give personal explanations of details that appear in written form which the student hasn’t read. Read it first, then I’ll answer any questions about ambiguities or facts you might not know.

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5. “The UNIX Programming Environment” handout for CS107, a Spring 2007 course at Stanford University. Other online or handed out instructions about using the software technologies for the course.

This material can include UALBANY helpdesk web pages, Unix online manual “man”, Web resources or other books. The topics include basic Unix command line shell usage and scripting, and working with files and directories in particular. Details will be specified in handouts, assignments, labs and lectures.


7. Support material for learning and doing C programming. This includes a slide copy handout from Bryant and O’Hallaron and the Glibc documentation posted online by the Free Software Foundation (easily found with Google).

1 Learning Objectives

The course will cover most of Patt and Patel’s book (PP), some of chapters 1, 2, 3, 5, 7, 9 and 10 of Bryant and O’Hallaron’s book (BOH), and an introduction to the basics and the internals of Java.

There will be about 6-8 programming projects, some of which will be multi-part. The languages will range from C++ or Java (your choice), C, PP’s toy LC-3 machine language and assembly language, real-world IA32 assembly language (of the Pentium and its clones) embedded in GNU C, and introductory Java.

Our goal is to teach you some detailed basics plus how to continue learning so you know what you are doing and talking about in computer programming. (The beginnings of the textbooks explain the motivation and value for this kind of course.)

Our subject is what the computer hardware and system software is driven to do when high level computer software runs. The subject also builds concepts, tools, techniques, and skills that pertain to programming and data structures which were introduced in the prerequisite courses. The emphasis now is on understanding how things work. Learning and applying technical details in the subject matter will be required for success in the projects, exams, etc. in the course. Learning to understand how such things work is the kind of experience enables programmers and others involved in software to formulate and solve problems confidently, and, specifically, to evaluate, criticize, and improve computer system performance.

This course is the third in the programming, data structures and systems sequence (201 - 310 - 333 - 402) that Computer Science majors all take. However, CSI333 is a “serious” course because it is the first sequence course that required only for majors in Computer Science. The course will be taught for the students who are committed to major-level study. They will prepare themselves for the challenging career or academic opportunities that Computer Science study leads to. All other qualified students are welcome provided they are willing to provide comparable commitment.

CS Minors and others who are interested in learning to use and apply information technologies more directly than by spending time and effort on general computer internal principles and details are advised to take other courses.
1.1 Topic List

1. Data representation by bits, bytes and addresses.

2. Brief survey of what computers do and how they work in terms of digital logic and how it implements machine language.

3. Machine and assembly language programming, and how higher level program structures are realized.

4. Comprehensive introduction to the C language, with connections and comparisons with assembly language, C++ and Java drawn. Practice with multi-module C programs that use external files and hash tables.

5. Usage and programming in the command line (shell) UNIX environment, including shell scripts, make, C preprocessor and macros, multiple modules expressed with multiple files, etc.

The C programming language is covered because C exposes and expresses “how things work” clearly and directly. It is the current standard for system interfaces and low level computing models.

Command-line UNIX is covered (as opposed to more popular and easy to use graphical environments) because it exposes and expresses very clearly and simply what the underlying system software is doing. It enables programmers (and network or system administrators, “power users”, etc.) to control, customize and script the steps relevant to their tasks. Shell scripts enable people to plan, document (with comments), communicate and reuse sequences of computing steps.

6. Additional topics: Tools for debugging and for viewing and sometimes editing object, executable, image and other binary files. Graphics files, virtual memory, performance measurement, and implementation of Java (including an introduction).

7. Some concepts and technicalities needed for working with multiple computers and file systems over the Internet network.

2 Discussion and/or Laboratory Sessions

Beginning now, every student must participate in one of the discussion meetings. (Wednesdays 12:35PM-1:30 in BA-212 or Fridays 10:25AM-11:20 in SL0G12). You should try to attend the one in which you are registered, but you may attend the other one regularly or occasionally if there is a scheduling conflict or other inconvenience.

Discussion assignments and formal instructor-led laboratory sessions will be announced.

Staff office hours and locations are linked from our web site.

Some self-paced technology tutorials may be assigned.

Quizzes will sometimes be given in lectures to monitor student preparation, progress, learning needs and attendance. Points for attendance and acceptable quiz answers will be included in the discussion participation score.
3 Computer Resources and Usage

You must be able to use the UAlbany ITSUNIX system. It is a remote server which we access via SSH to www.itsunix.albany.edu with our UAlbany net-id and password. Students and staff use the same ones to access MyUAlbany and the UAlbany wireless network. The ITS Windows PCs in the Science Library Information Commons and in the Main Library Computer User Room provide access for everyone.

Some of the course work can also be done with the Cygwin Unix-emulation software now installed on those ITS Windows PCs. Some exercises also be assigned to use other software installed there (Multimedia Logic, gimp, ... ). You can download and install all such software free on your own computer.

SSH access to a new IA32 (Pentium 4) Linux server will be provided to CSI333 students for some assigned laboratory and project work. Note that BOH specify students have access to such a machine. Stay tuned.

3.1 Your Own Computers and Files

You are encouraged to administer and use a Linux system, the UNIX command line environment and compiler on current Macintoshs, or Cygwin on your own computer. I will provide any advice I can.

However, late or missing assignments will NOT BE EXCUSED for the reason of any kind of problem with your own equipment, software or Internet connection. Also, do not let such problems delay your assigned course study and work. Use the University facilities to get the assignments done on time, and then work on your own system. The University provides student user rooms and other infrastructure sufficient for the course requirements. On the other hand, delays due to failure of University systems will be excused.

The University ITSUNIX and network disk (storage.albany.edu) is very reliable and it is backed up one or two times per week. However, retrieving deleted files is cumbersome. WARNING: On the ITS Windows PCs, files saved to “My Documents” or anywhere else EXCEPT for the “S:” drive are local to the desktop, will be deleted when it is rebooted, and can be deleted or stolen by the next user.

It is YOUR RESPONSIBILITY to be very careful about deleting files, and to use a reliable way to keep your files safe. (That might be to always use the UAlbany network drive and/or a redundant couple of USB keys or CDR disks. Floppies are passé.)

4 Project and other Electronic Submission

(This is NEW FOR UALBANY CSI201-310 alumni.) Electronic submissions will all be done with a web browser via WebCT. You can access your ITSUNIX files (1) via the “S” drive on the UAlbany ITS Windows PCs or (2) via a Windows Network/SAMBA drive with domain name storage.albany.edu/your UAlbany netid\.)
5 Evaluation

Midterm – Oct. 11, 2007 (Thurs) : In class – 25%
Final – Dec. 11 2007 (Thurs) : 10:30AM-12:30PM – 35%
Lab. Exer., Quizzes, Attendance – – 10%
Programming Projects – – 30%

Final letter grades will be based on cutoffs applied to your score computed as above and modified according to the following policy:

40% on each of at least three of the programming projects, a 40% total score AND a final or average exam grade of at least 40% is the minimum for passing the course (with a D-). 60% on each of at least four of the programming projects, a 50% total score AND a final or average exam grade of at least 60% is the minimum for a C. However, I reserve the right to assign a higher grade based on a record of substantial improvement.

I will set a grading scale so that C (2.0) indicates the minimum necessary preparation for passing CSI402 (Systems Programming) 4th Albany CS Major programming sequence course). The “C” (2.0) or better grade in CSI333 is a prerequisite for the require CS major courses CSI402. (Except if you declared your CS major prior to Sept. 1, 2001)

Estimated grades based on the midterm exam score will be announced with the midterm results. Details regarding the exams will be announced later. A sample year’s midterm will be posted on the Web.

6 Policy on Cheating:

1. Cheating in an exam will result in an E grade for the course. Further, the students involved will be referred to the University Judicial System.

2. The code and any written reports or answers for programming assignments; and written answers for homework or lab exercises must be written by yourself. You are welcome to discuss the class material, the problems and ideas for solutions; but each person is expected to write the code and answers he or she submits independently, without copying.

   Cheating in a programming assignment or exercise will result in a ZERO for that requirement for all the students involved. Students who cheat in two or more programming assignments/lab exercises will receive an E grade for the course.

   A report of the every cheating incident will also be made to the Office of Undergraduate Studies in accordance with the University regulations concerning “Penalties and Procedures for Violations of Academic Integrity” in the Undergraduate Bulletin.

   We may do automated code comparisons between submissions of current students together with submissions from prior course offerings to detect copying.

3. Violations of UAlbany policies posted on http://www.albany.edu/its/cio_glance_it_policies.htm laboratory systems are regarded as academic integrity violations, like cheating.

   Attempts to use ECL, ITS or CS Dept. computers in violation of these regulations may result in account suspension, course failure or referral to University disciplinary action. The impli-
cations of the responsible use requirements of shared computer and network infrastructure is an element of this course’s curriculum and so course failure or grade reduction can be imposed by the instructor as a sanction against the violation of laboratory rules and procedures. Failure to comply with instructions given to you by system administration or course instructional team staff members in regard to Lab usage is disruptive and is grounds for sanction.

Willful illegal, malicious or disruptive use, or attempts to disguise one form of computation as another will be taken particularly seriously.

You are also warned against disclosing your password to anybody either willfully or by accident. Another person knowing your password can really get you into trouble. Similarly, if your password is compromised or you change the permissions of your files so that others can read them, they might copy your work and you might get caught when we compare submissions.

4. Ignorance of the quota \texttt{-v} command to monitor your Unix account disk quota and the steps you must take to reduce disk space usage are likely to result in you account becoming unusable when you need it most. If this happens, corrective actions might take several days. Lateness of programming projects or lab exercises will not be excused, nor can any “urgent” system administration actions be taken.

7 Other

7.1 Make-up Exams

Make-up exams will be given only for valid and verifiable excuses (e.g. a major medical situation). In such a case, it is your responsibility to contact the instructor \textit{ahead of time} if at all possible.

7.2 I grades

A grade of \texttt{I} will only be given for genuine extenuating circumstances that are beyond your control after the midterm point. Both of the following conditions must be met:

1. Your work must be in good standing as of October 11, 2007, the day of midterm exam, defined as follows: You must have an average score of at least 50\% on the programming assignments and at least 50\% on the lab exercises due up to that point; and further, your midterm grade must also be equivalent to at least a \texttt{C}. Therefore, if you miss the midterm or have performed poorly on programming assignments or lab exercises, you are not eligible for an I grade.

2. Written documentation must, upon request, be supplied about the extenuating circumstance either by you or by the University administration. Vice-Provost Sue Faerman for Undergraduate Education and her assistants are there to assist you and will write letters to your professors that request appropriate accomodations.

Under no circumstances will the condition for completing an I grade be that the entire course be retaken later without a new registration.
7.3 Disabilities, etc:

Accomodations will be made for clients of the Office of Disabled Student Services upon adequate prior notice and according to that office’s policies.

Students with genuine continuing hardship situations, or any disability related problems with computer programming activities usage should confer with the professor before October.

7.4 Attendance

You are responsible for all material presented in the lectures. Some of that material will not be presented anywhere else.

Sometimes quizzes will be given in lectures. They will be counted into the lab scores. No makeups will be given except for genuine, documented extenuating circumstances.

Make sure you have a trusted friend to lend you lecture notes if you are going to miss a lecture.

7.5 Other Other

1. During their office hours, the instructor and the teaching assistants for this class will be glad to help you with the course material and the programs.

2. In addition to the regular office hours, you can also set up an appointment to meet with your instructor and the teaching assistants.

3. We will answer “reasonable” questions by email; which means definite questions that have definite and short answers; and which are at the academic level of the course and on course topics. We may edit and post on the Web questions and answers we think would be helpful to others (but I will email you a personal reply too.) We will remove your name to preserve privacy, unless you specifically state in your message that you would like your name included if we decide to post the question. We might ignore any others. We will not write or copy long explanations that repeat material we presented or are available for you to read.