

IS 231 – Computer Programming II

Course Syllabus and Calendar – Spring 2000

Professor Don Colton

Brigham Young University—Hawaii Campus

Abstract

- **Course Number:** IS 231
- **Title:** Computer Programming II
- **Old Course Description:** Emphasis on structured methodology of program design, development, testing, implementation, and documentation, including arrays, records, and pointers. (Prerequisite: IS 230.)
- **New Course Description:** Emphasis on web programming (CGI, sockets), problem solving, stacks, queues, associative arrays, regular expressions, data manipulation, and simple algorithm analysis. Review of looping and precedence. (Prerequisite: IS 230 or equivalent.)
- **Textbook 1:** *Learning Perl*, by: Randal Schwartz and Tom Christiansen.
- **Textbook 2:** *Programming Perl*, by: Larry Wall, Tom Christiansen, and Randal Schwartz.
- **Classroom:** GCB 140
- **Class Time:** MWF 7:00–8:50 AM
- **Final Exam:** 16 June 2000
- **Instructor (me):** Don Colton
- **My email:** don@colton.byuh.edu
- **My Office:** GCB 130 B, Phone: 293-3478
- **My Office Hours:** MWF 9:00–10:50 AM
- **Teaching Assistant:** Bong Siu
- **T.A. Hours:** daily 8:00–10:00 PM
- **T.A. Location:** GCB 140

1 Why Take This Course?

Companies everywhere are eager to get onto the World Wide Web. They can choose to be present but not special with off-the-shelf software, or they can grab for market share with a more exciting and satisfying user experience, using home-grown or customized software. Programmers have become as vital as accountants in this new world order.

I assume that you want a programming job, or at least the ability to use programming in your future job. Some of you may be ready right now. At the successful conclusion of this course, many of you will be qualified to start work in most entry-level IS programming jobs.

We will develop your programming skills by completing projects in areas that support electronic commerce on the web. We will develop your knowledge of a number of additional topics that you are likely to encounter in programming.

This course and its predecessor (IS 230) teach you to program well enough that you can easily learn any language employers want, now or in the future. Perl (which is in the same language family as C, C++, and Java) is probably the most popular language on the server side of the web.

Knowledge of operating systems is also very important. Today's client-side world seems dominated by Microsoft Windows, but there is a strong server-side presence from Unix. UNIX and Windows are the two operating environments that I believe will dominate the IS computing world in the next decade and beyond. Therefore, this class utilizes UNIX to a modest degree. You will know the most commonly used commands, including those for file system maintenance (how to move from directory to directory, make new directories, move, rename, and delete files, etc.). You will know how to operate the most prominent free-software text editor, EMACS.

At the end of this course, you should feel comfortable listing Perl, UNIX, and EMACS among your skills on your résumé.

2 Prerequisites

The prerequisite is IS 230 (Computer Programming I). I assume that you have written some programs. You know how to use **printf**, **if**, **else**, **while**, **do while**, **for**, and subroutines. I assume that you have some skill, but you are not ready to sit in an interview and claim that you are a programmer.

3 Grading

Your grade is earned by getting points for completing labs, readings, and tests. Once your computer account is set up, progress reports are available to you by computer at any time.

programming labs	16	535 pts
readings	10	165 pts
tests	5	150 pts
final exam	1	150 pts
extra credit	3	120 pts
total possible	35	1120 pts

930+	A	900-929	A-	870-899	B+
830-869	B	800-829	B-	770-799	C+
730-769	C	700-729	C-	670-699	D+
630-669	D	600-629	D-	0-599	F

Deadlines: Each assignment has a deadline. You can see these deadlines by sending email to GradeBot (see below) asking for a *status* report. Most deadlines are “soft.” Before the deadline an item is worth a certain number of points (100%). After the deadline, it is worth somewhat less each day until it reaches maybe 60% of its original value. It then remains near the 60% level until the last day of class. All work must be completed by the end of the last day of class. The final exam has a separate deadline.

Incomplete and UW: If you quit working in the class before achieving a passing grade, I will probably give you a “UW” grade instead of an “F.”

I do not give “I” grades (incompletes) except in unusual circumstances. In my experience only a small fraction of incompletes are ever completed. I will consider giving you an incomplete if you request it, seem to have a good reason, have a pretty solid timeline for completion, and you get the necessary paperwork filled out.

4 Work (No Pain, No Gain)

Most of your time will be spent writing programs. I am not sure how much time it would take a good student programmer to complete all of these assignments. A professional could probably do all of them in a week. But you are not a professional yet. The work is difficult mainly because it is unfamiliar. Our task is to make it familiar, and therefore easier. You will find that assignments you did in three or four hours early in the semester can be done much more quickly later in the semester. You should feel a great sense of achievement.

Reading: Perl is a serious and powerful language. *Learning Perl* by Schwartz and Christiansen is a light book that covers the most-used features of the Perl language. It includes a chapter on CGI programming. The book seems to me very easy to read. If your programming background is shallow, you will probably want to begin with this book.

Programming Perl by Wall, Christiansen, and Schwartz is a much more serious and detailed treatment

of the Perl Language. Larry Wall is the primary creator of the language, so this book is very authoritative and much more complete. It is also quite well written. If your programming skills are more advanced, you may want to skip the “Learning” book and go straight to this “Programming” one.

I do give credit for reading in the books. To honestly get reading credit, you must let your sight rest on each of the words in the assignment, and you must try to understand what is being said. If you can speed-read some or all of it with reasonable comprehension, that is acceptable too.

As you complete each assigned reading mentioned on the course calendar, notify me by submitting a program that tells me “I read chapter 1, Introduction, of Learning Perl by Schwartz and Christiansen.” Or something like that. Email GradeBot (see below) for authoritative details. When you submit such a program, you are asserting that you have in fact done what the program says about you.

Labs: The key to a programming course is programming. (Duh.) You will complete a number of programs. Programs are graded by GradeBot (see below). Each must run perfectly before it will be accepted.

Tests: There are five tests and one final exam in this class. All except the final are given at the testing center. Most use bubble sheets. You can complete the tests as soon as you want. I allow unlimited time and scratch paper, but no books, no notes, and no calculators. For each test, a sample test is available through GradeBot for you to use as a study guide. You only get one chance to take each test. (If you feel there is some special reason you should get another chance, such as illness, discuss it with me.)

5 Lectures

Those who took IS 230 (IS 131) from me will wonder whether IS 231 will be the same. As you will recall, in that class each day I asked “Do you have any questions?” and then simply (or elaborately) answered them. Because students moved at vastly different paces, based on their vastly different backgrounds and aptitudes, the discussion was not always meaningful to everyone. Some were behind. Some were ahead. Some stopped attending because they got so far ahead. That was okay.

In IS 231 the differences is much less. We are all “up to speed.” We have more that we can talk about together. It is more likely that the discussion will be meaningful to nearly everyone.

I still like that general “got questions?” philosophy. It leaves the responsibility for learning with the people that are supposed to learn: the students. (I cannot learn

for you.) Canned lectures can be fun and exciting, but often I have found myself simply presenting material that was already presented in the reading, which discouraged students from even doing the reading. This did not seem the best use of limited class time.

You do your part by reading, attempting the labs, deciding what questions to ask in class, and bravely asking them. I prepare the overall calendar, the syllabus, the list of assignments, the GradeBot routines to grade them, and the schedule of readings. I also prepare myself to answer whatever questions you can think of.

Attendance: I discourage absenteeism. I encourage you to use your time wisely. For most of you, that usually means being present in class.

The on-line *status* report gives you a timeline for your progress through the tests and lab assignments. If you are making progress, you are counted present whether you actually come into the classroom or not. If you stop making progress, and have not earned a passing grade, you will be counted absent, unless you actually come into the classroom and make me aware of you. If you have not been making progress and do not have a passing grade by the end of the semester (or term), you will probably receive a grade of “UW” (unofficial withdrawal) instead of an “F.”

Due to INS (immigration) and VA (veterans) requirements the Vice President for Student Life is notified whenever a student misses four consecutive class days. In the context of this class, that happens when you are not actively working on assignments for a period of approximately ten calendar days.

6 GradeBot

GradeBot is my robotic program grader. It is generally available 24 hours a day, seven days a week, to grade and return your lab assignments. This is currently done via email.

I enable you to have a computer account on the is230.byuh.edu Linux host. This account gives you access to a UNIX system, software (including compilers and assemblers), email, and some storage. You can also put up your own web page and cgi scripts. Most of you will use this account to do all the lab work in this class. See me if you need any help getting set up.

GradeBot is correct and authoritative. It is your boss. It is your client. It is your Drill Sergeant. There is always a particular correct behavior that it demands. You must make your program behave in exactly the way that GradeBot is requiring (including spelling errors, if any). Be sure to look at a sample “conversation” with GradeBot before you start writing your program.

To submit a program to GradeBot, send it by email to <gradebot@is230.byuh.edu>. You can do this from almost anywhere on the Internet. The basic subject line

for this class is “Subject: is231”. With “Subject: is231 status” you get a *status* report telling you everything you have completed, everything that is still due (and when), and what grade you have earned or are likely to get. To submit an assignment “xxx” to GradeBot, the subject line is “Subject: is231 xxx”. If you are having problems with extra stuff appearing after your program (such as an advertisement for junos or hotmail), you can put a “BEGIN” line before your program and an “END” line after it. Currently GradeBot does not understand attachments; your program must be in the body of your message. Do not use any special encoding, such as HTML or MIME.

If you discover a case where you believe that GradeBot is wrong, tell me about it. If you found an error in GradeBot, I generally reward you with some extra credit. Otherwise, you must assume GradeBot is right.

7 Lab Submission Rules

Cheating has never been a problem in this class, but there are rules. I am unhappy when I see cheating in any class. These may be cases where one student gives a copy of their completed program to another student, and the second student keys it in, possibly with minor changes, such as changing the names of variables. In worse cases, the second student uses cut-and-paste to copy the program, or sections of it. In almost every case, the second student *does not understand how the program works*, or why the program says what it says. I consider any such behavior to be plagiarism and an honor code violation. I want you to learn, but not do things that might let you complete the assignments without learning.

Open-Neighbor versus Copying: All labs are “open-neighbor” in the sense that you can *confer* with other people. You can read their code (if they let you). You can show your code to them. You can talk about your code, your approach, your difficulties, and your ideas. You can draw pictures and make analogies and ask questions. You can use their ideas. However, *you cannot make a copy of their code or submit their code to GradeBot, even if you first modify it.*

Never let another student take, borrow, or keep a copy of any program you wrote for this class. You can look at it *together*. If it is printed, please look at it away from any computers. If it is online, look at it on the author’s own screen. Never bring up a window on the second student’s screen so they can look at the first student’s program. You can talk about what the program does, and why it is that way. Do NOT leave them with a copy of your program.

If you receive a copy of a program from someone, and use it as the basis for the program you are submitting, you are cheating.

8 Programming Labs

The purpose of lab work is to experience programming and grow thereby. Programming can be an extreme joy, where time ceases to exist (e.g., hours pass quickly but you don't notice). It can be a great pleasure to cause a machine to produce reports and process data at your will. Or it can be a nightmare, where nothing seems to work right, and the most insignificant things turn out to have far too much significance, and you pull out great clumps of your hair and hit your head against the wall and you are glad that not every IS professional needs to be an accomplished programmer. Labs reflect the true reality of a programmer's life. You should experience labs.

Real Labs, Approach: I believe in the *successive refinement* approach to programming because it keeps you from getting buried in details. In this approach, you (the programmer) make your program do something simple that is a subset of the final desired behavior. When that is working, you add something else and get it working. Think Genesis chapter 1.

As your program is tested by GradeBot, it will generally try easy things first. Then, as your program responds properly to the easy cases, it may try more difficult ones. This sequence is exactly like most programming jobs. Programmers are seldom if ever given a complete specification for any business program. Instead they are given a rough spec. Only after the customer sees the program up and running are the other requirements (the details) discovered. Build your programs in such a way that these modifications do not cost you much lost time.

9 Assignment Calendar

The names, dates, and points on this list are not guaranteed, but they are approximately correct. You should run a GradeBot status report to find the authoritative, correct due dates for you. The wording in this list is condensed to make it fit the space available.

1: hello	thru Apr 28	15 pts
2: sc1	thru Apr 28	30 pts
3: sc2	thru Apr 29	15 pts
4: sc3	thru May 01	10 pts
5: qprec	thru May 01	30 pts
6: sc4	thru May 02	7 pts
7: sumProd	thru May 02	30 pts
8: starbox	thru May 03	30 pts
9: etut	thru May 04	40 pts
10: sc5	thru May 04	4 pts
11: sc7	thru May 05	15 pts
12: cgi0	thru May 05	30 pts
13: cgi1	thru May 06	30 pts

14: qregex	thru May 08	30 pts
15: sc8	thru May 08	8 pts
16: sc9	thru May 09	6 pts
17: qloops	thru May 09	30 pts
18: qbigoh	thru May 10	30 pts
19: qprintf	thru May 11	30 pts
20: roman	thru May 12	30 pts
21: checkwr	thru May 13	30 pts
22: sc19	thru May 15	30 pts
23: hfetch	thru May 17	30 pts
24: nkrypto	thru May 20	40 pts
25: sitemap	thru May 25	40 pts
26: index	thru May 30	40 pts
27: robot	thru Jun 02	40 pts
28: search1	thru Jun 06	40 pts
29: search2	thru Jun 09	30 pts
30: preced	thru Jun 13	40 pts
31: search3	thru Jun 16	40 pts
* 32: wcs1	thru Jun 16	20 pts
* 33: zoo1	thru Jun 16	50 pts
* 34: zoo2	thru Jun 16	50 pts
35: final	thru Jun 16	150 pts

10 Office Hours

Office hours are generally posted outside my office door. I also have an open-door policy, posted on my office door as follows: "If my door is open (even just a bit) feel free to knock and come in. – Bro. Colton" Students for whom the posted hours are not convenient, or who just want a guaranteed appointment, can contact me by email to make an appointment.

11 Subject to Change

It is possible that I will make a few small changes. If any of my changes seems unfair to you, let me know. I will try to correct it.

IS 231 Course Calendar

The first period of class is an orientation to the class. I demonstrate (using an overhead projector) how to do the lab work.

- 26 Apr: first day of class
- 29 May: Memorial Day Holiday (no class)
- 14 Jun: last day of instruction.
- 16 Jun: Final Exam In Class