IS 231 – Computer Programming II
Course Syllabus and Calendar – Fall 1999

Professor Don Colton

Brigham Young University—Hawaii Campus

Abstract

- **Course Number:** IS 231
- **Title:** Computer Programming II
- **Course Description:** Emphasis on structured methodology of program design, development, testing, implementation, and documentation, including arrays, records, and pointers. (Prerequisite: IS 230.)
- **Textbook:** *The C Programming Language*, by: Brian W. Kernighan and Dennis M. Ritchie.
- **Classroom:** GCB 150
- **Class Time (Section 1):** TTh 8:00–8:50 AM
- **Class Time (Section 2):** TTh 9:00–9:50 AM
- **Final Exam:** TBA
- **Instructor (me):** Don Colton
- **My email:** don@colton.byuh.edu
- **My Office:** GCB 130 B, Phone: 293-3478
- **My Office Hours:** MWF 10–11

1 Why Take This Course?

I assume that you want a programming job.

We will develop your programming skills by completing projects in several areas, chosen based upon my own experience as an IS programmer at Texas Instruments and as a consultant in Boston, and my years of teaching experience. We will use string functions to extract information from log files and printf to create reports for tracking and management. We will also organize and access complex data in memory and in files. We will develop your knowledge of a number of smaller topics that you will encounter in programming. We will improve your programming speed by holding some in-class contests.

At the successful conclusion of this course, many of you will be ready to start work in most entry-level IS programming jobs.

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**, **while**, **do while**, **for**, and subroutines. You have some skill, but you are not ready to sit in an interview and claim that you are a programmer.

We will use the C programming language and the UNIX operating system in this class. If your background does not include these, we may (or may not) be able to work out another alternative for you. See me right away.

3 Grading

Your grade is earned by getting points for readings (200), labs (410), contests (120), and tests (340). There are 1070 points possible. You need 930 for an A.

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/UW

Deadlines: Each assignment has a deadline. You can see these deadlines by sending email to GradeBot (see below) asking for a status report. The 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 60% of its original value. It then remains at the 60% level until the last day of class. All work must be completed by the end of the last day of class, except the final exam which may have a different deadline.

Incomplete and UW: If you quit working in the class before achieving a passing grade, I will probably give you a "UW" grade.

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 Load (No Pain, No Gain)

The work load is about 30 hours reading (unless you are fast), 60 hours programming, and 10 hours testing (preparing for and taking quizzes and tests). We spend about 30 hours in class. This seems reasonable to me for a three-credit class.

Reading: The book is about 200 pages long. It is compact and excellent. It gets straight to the point, gives one good example (maybe two), and moves on to the next topic. Study it carefully. Note the questions that you have; we can discuss your questions in class.

As you complete each assigned reading mentioned on the course calendar, you should notify me by submitting a program (cute, huh?) that tells me "I read chapter 1: A Tutorial Introduction of The C Programming Language (the White Book) by Kernighan and Ritchie." 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 that reading.

Labs: The key to a programming course is programming. (Duh.) You will complete about seventeen programs, including six contest programs that are done in class. Programs are graded by GradeBot (see below). Each must run perfectly before it will be accepted.

Tests: There are two quizzes, one midterm, and one final exam in this class. All of them (probably including the final) are given at the testing center using bubble sheets. I allow unlimited time and scratch paper, but no books, no notes, and no calculators. For each test, I will give you a sample test (with answers) that you can use as a study guide. The midterm is based largely on the final exam that I give in IS 230. I don't have the other tests worked out yet.

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 (this class) I expect the differences will be much less. We are all "up to speed." We will have more that we can talk about together. It is more likely that the discussion will be meaningful to everyone.

I still like that general "got questions?" philosophy. It puts the responsibility for learning on the ones that **can** learn: the students. 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 is not 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 (and the GradeBot routines to grade them), and schedule the readings. I also prepare myself to answer whatever questions you can think of.

Attendance: The calendar and the on-line status report give you a timeline for your progress through the class 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. If you have not been making progress and do not have a passing grade by the end of the semester (or term), you will receive a grade of "UW" (unofficial withdrawl) 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.

6 GradeBot

GradeBot is my robotic program grader. It (he?) is available 24 hours a day, seven days a week, to grade and return your lab assignments. This is done via email. Obviously this means that you must maintain an email account to complete this class.

I provide you with a computer account on the is230 UNIX host. This account gives you access to a UNIX system, software (including compilers and assemblers), email, and some storage. 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 wants. You must make your program behave in exactly the way that GradeBot is requiring. This may involve changing the wording of your prompts and/or the spacing and wording of your output. It will not significantly alter the difficulty of the problem.

To submit a program to GradeBot, send it by email to ¡gradebot@gradebot.byuh.edu¿. You can do this from almost anywhere on the Internet. The basic subject line for this class is "Subject: is231". That will get you 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 "x" to GradeBot, the subject line is "Subject: is231 x". If you are having problems with extra stuff appearing after your program (such as an advertisement for juno or hotmail), you can put a "BEGIN" line before your program and an "END" line after it. 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.

It is possible but unlikely that GradeBot will make some major crazy mistake. If you find an example of this, bring it to me. I will generally reward you with some extra credit. Otherwise, you must assume GradeBot is right.

7 Lab Submission Rules

I do not expect that cheating will be a problem, but I have rules anyway.

There are several rules that I use in this class. **These rules apply to the programs you submit to GradeBot.** They are designed to allow you to learn, but to prevent you from doing things that might let you pass the class without learning. Violation of any of these rules is typically regarded as a violation of the BYUH honor code. You will receive a score of zero for any such assignment, and it cannot be made up. Repeated violations may lead to failing the class. Please be careful what you submit.

The Keystroke Rule: Every keystroke in every lab you submit must come from **your own fingertips.** (If you are handicapped in some way that makes typing difficult or impossible for you, check with me. We can make a special exception for you if necessary.) You can re-use code that you wrote in a prior assignment (or in a prior class or in a prior job). You are forbidden to submit any code that was not typed by you yourself. You are permitted to copy things (particularly text strings) that GradeBot sends you in response to your submission.

The Open-Neighbor Rule: All labs are "open-neighbor" in the sense that you can **confer** with other students and lab assistants. You can read their code (if they let you). You can share your code with them. You can talk about your code, your approach, your difficulties, and your ideas. You can draw pictures and make analogies and ask the TA or me (even me) questions. You can use their ideas. However, you cannot submit their code to GradeBot, even if you first modify it.

The Looking Rule: Except for looking at the textbook, you are not allowed to look at your own code that you will be submitting and somebody else's code at the same time. If you look at somebody else's code, you must wait at least ten seconds before looking at your own code again, and vice versa. If you find yourself looking back and forth between your program and their program, you are probably copying, which is strictly against the rules.

The Challenge Rule: If I think that you may have violated these rules on some particular assignment, I will ask you (by email or in person) to state that you followed these rules. If I don't hear back from you, I will assume that you cheated and set your grade to zero for that assignment.

8 Contests

Six labs are designated as contests. I will disclose information about each of those labs at the start of class on the day the lab is due. (This means the labs cannot be completed in advance.) The goal is to improve your programming speed by forcing you to think and program in a higher-stress setting, such as you may encounter in some job interviews. (Yes, I have been asked to write sample programs during job interviews, and I have asked applicants to do the same when I was interviewing.) Although my goal is that you finish the lab in class before an hour is up, I do allow you to complete the lab later that same day for full credit.

9 Assignment Calendar

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 1: args     thru Aug 31 (Tue) worth  20 pts
 2: ch1      thru Aug 31 (Tue) worth  25 pts
 3: succ     thru Sep 02 (Thu) worth  20 pts
 4: ch2      thru Sep 02 (Thu) worth  25 pts
 5: con1     thru Sep 07 (Tue) worth  20 pts
 6: ch3      thru Sep 09 (Thu) worth  25 pts
 7: ch4      thru Sep 14 (Tue) worth  25 pts
 8: con2     thru Sep 21 (Tue) worth  20 pts
 9: ch7      thru Sep 23 (Thu) worth  25 pts
10: epa      thru Sep 23 (Thu) worth  50 pts
11: eps      thru Sep 28 (Tue) worth  30 pts
12: ch8a     thru Sep 28 (Tue) worth  15 pts
13: midt     thru Sep 28 (Tue) worth 100 pts
14: epf      thru Sep 30 (Thu) worth  30 pts
15: con3     thru Oct 05 (Tue) worth  20 pts
16: coln     thru Oct 07 (Thu) worth  50 pts
17: ch5      thru Oct 07 (Thu) worth  25 pts
18: ch6      thru Oct 12 (Tue) worth  25 pts
19: con4     thru Oct 19 (Tue) worth  20 pts
20: web1     thru Oct 21 (Thu) worth  50 pts
21: web2     thru Oct 28 (Thu) worth  30 pts
22: ch8b     thru Oct 28 (Thu) worth  10 pts
23: con5     thru Nov 02 (Tue) worth  20 pts
24: web3     thru Nov 04 (Thu) worth  30 pts
25: zoo1     thru Nov 16 (Tue) worth  50 pts
26: con6     thru Nov 16 (Tue) worth  20 pts
27: zoo2     thru Nov 23 (Tue) worth  50 pts
28: qoh      thru Nov 23 (Tue) worth  20 pts
29: qre      thru Nov 30 (Tue) worth  20 pts
30: final    thru Dec 02 (Thu) worth 200 pts
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10 Office Hours

Office hours are 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 very rare that I make major changes, but I might. If my changes seem unfair to you, let me know. I will try to fix it.

IS 231 Course Calendar — Fall 1999

Dates are approximate. See GradeBot for authoritative due dates for things that are graded.

mtg	day	date	time	read	Topic	due (pts)
1	Thu	Aug 26	9am		Orientation, Syllabus, argc, argv	args (20)
2	Tue	Aug 31	9am	1	Tutorial / Review, atoi, strtoul	ch1 (25), succ (20)
3	Thu	Sep 2	9am	2	Types, Operators, Expressions	ch2 (25)
	Mon	Sep 6			**Holiday: Labor Day**	
4	Tue	Sep 7	9am		In-Class Competition 1	con1 (20)
5	Thu	Sep 9	9am	3	Control Flow	ch3 (25)
6	Tue	Sep 14	9am	4	Functions	ch4 (25)
7	Thu	Sep 16	9am	B3	String Functions: English to Pig Latin	epa (50), eps (30)
8	Tue	Sep 21	9am		In-Class Competition 2	con2 (20)
9	Thu	Sep 23	9am	7	Input/Output: fopen, fclose	ch7 (25), epf (30)
10	Tue	Sep 28	9am	8.1-5	Unix Interface	ch8a (15), midt (100)
11	Thu	Sep 30	9am		Log Input: fgets, strtok	coln (50)
12	Tue	Oct 5	9am		In-Class Competition 3	con3 (20)
13	Thu	Oct 7	9am	5	Pointers	ch5 (25)
14	Tue	Oct 12	9am	6	Structures. qsort: input prep	ch6 (25)
15	Thu	Oct 14	9am	qsort	qsort: compare, raw output	web1 (50)
16	Tue	Oct 19	9am		In-Class Competition 4	con4 (20)
17	Thu	Oct 21	9am		Grouping and Control Breaks	web2 (30)
18	Tue	Oct 26	9am		Headers and Page Breaks	web3 (30)
19	Thu	Oct 28	9am	8.6-7	Directories, Malloc	ch8b (10)
20	Tue	Nov 2	9am		In-Class Competition 5	con5 (20)
21	Thu	Nov 4	9am		Animal: in memory	zoo1 (50)
22	Tue	Nov 9	9am	6.5	Graphs	
23	Thu	Nov 11	9am		Animal: on disk, fseek	zoo2 (50)
24	Tue	Nov 16	9am		In-Class Competition 6	con6 (20)
25	Thu	Nov 18	9am		Big Oh	quiz (20)
26	Tue	Nov 23	9am		Regular Expressions	quiz (20)
	Thu	Nov 25			**Holiday: Thanksgiving Day**	
	Fri	Nov 26			**Holiday: Day after Thanksgiving**	
27	Tue	Nov 30	9am		TBA	
28	Thu	Dec 2	9am		Review for Final	final (200)

Note: This is a three-credit class. At the time the Fall 1999 schedule was drawn up, it was a two-credit class, so it only got two hours per week of meeting time. It will be tight, but I think we can cover all the material we need to in class. I will rely on you to do your reading and labs and quizzes and tests outside of class. Class is primarily for answering questions (getting you unstuck).

Final Exam: This two/three credit change also affects our final exam time. The Fall 1999 schedule does not specify the final exam time for three-credit classes that meet TTh at 8 AM or at 9 AM. The actual exam time is "to be announced." I think there is a good chance we will hold it in the testing center.