

CS 235 – Foundations of Computer Science I

Course Syllabus and Calendar – Winter 2002

Professor Don Colton

Brigham Young University Hawai'i

1 Brief Overview

The foundations of Computer Science taught in CS 235 and CS 236 are the basis on which all later CS courses are built. It is important for the student to develop a sound understanding of these basic concepts.

1.1 The Course

- **Course Number:** CS 235
- **Title:** Foundations of Computer Science I
- **Course Description:** Iteration, induction, recursion, lists, trees, sets, relations, functions, mathematical analysis of algorithms and data models, implementation of abstract data types. (Prereq: CS 142, and some calculus exposure).
- **Textbook:** *Foundations of Computer Science, C Edition*, by: Alfred V. Aho and Jeffrey D. Ullman, ISBN: 1-7167-8284-7.
- **Class Time:** MWF 1:00–1:50 PM
- **Classroom:** GCB 140
- **Final Exam:** Mon 22 Apr, 3:00–6:00, GCB 140

1.2 The Instructor

- **Instructor (me):** Don Colton
- **My email:** don@cs.byuh.edu
- **My Office:** GCB 130 B
- **Office Hours:** MWF 7–10 AM, 2–4 PM
- **Main Teaching Assistant:** Andrew Thompson
- **T.A. Hours:** Mon–Thu, 6p–12, Fri 6p–11p
- **T.A. Location:** GCB 103 (CS Research Lab)

1.3 Office Hours

I am usually in my office with the door open. At least it seems that way to me. I 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”

Formally, my office hours for Winter 2002 are MWF 7 to 10 AM and 2 to 4 PM. Any changes will be posted outside my office door. Students for whom the posted hours are not convenient can contact me by email to make an appointment.

1.4 Special Needs

Brigham Young University–Hawai'i is committed to providing a working and learning atmosphere, which reasonably accommodates qualified persons with disabilities. If you have any disability that may impair your ability to complete this course successfully, please contact the students with Special Need Coordinator, Leilani A'una at 293-3518. Reasonable academic accommodations are reviewed for all students who have qualified documented disabilities. If you need assistance or if you feel you have been unlawfully discriminated against on the basis of disability, you may seek resolution through established grievance policy and procedures. You should contact the Human Resource Services at 780-8875.

1.5 Preventing Sexual Harassment

Title IX of the education amendments of 1972 prohibits sex discrimination against any participant in an educational program or activity that receives federal funds, including Federal loans and grants. Title IX also covers student-to-student sexual harassment. If you encounter unlawful sexual harassment or gender-based discrimination, please contact the Human Resource Services at 780-8875 (24 hours).

1.6 Subject to Change

It is possible that I will revise some aspects of the course as we go along. Any changes I make are likely to be to your advantage. If any of my changes seems unfair to you, let me know. I will try to correct it.

2 About the Course

In programming, there are certain “tricks of the trade” that you as a computer scientist are simply expected to know. This knowledge is the foundation of computer science as we know it today, and much of it is taught in this course.

The full “course” is organized into two halves, CS 235 and CS 236, normally taken in that order. The first half

covers program running time (big-oh notation), probability and counting (how long would a program run if it had to look at every case before it found the solution?), trees, lists, and sets. CS 236 covers relations, graphs, automata, and logic. It covers chapters eight through twelve and chapter fourteen of the textbook.

3 Lecture Policies

I typically use a flexible and open lecture style, rather than a regimented sequence of slides. I try to focus on interesting aspects of the subject matter, instead of simply repeating what you have read in the textbook. My goal is that you develop intuition about the subject matter, and get unstuck if you have become stuck. Accordingly, I devote as much time as necessary to answering your questions, especially when those questions seem to be of general interest to the others in the class. (Questions of narrow interest may be deferred to my office.) Otherwise, the time is generally spent in discussion of some topic or other that is closely related to the material in the textbook. I may pose a problem to the class and moderate as we work through it together. This can serve as a jump-start for understanding and mastering new material. My method of teaching is based on the view that learning is a shared activity between the teacher and the student, and that learning proceeds most quickly when interaction occurs.

4 Work Load

In the United States, the expectation for accredited university-level course work is that there be an average of three hours of work per week for every hour of credit awarded. In a lecture class this means one hour in class and two hours outside of class. Some of you are accustomed to working more and others less. It is my goal to keep the work load for an average member of the class at these levels.

5 Grading

I use the following grading scale, both for individual assignments and for the course as a whole.

93%+	A	90-92.9%	A-	87-89.9%	B+
83-86.9%	B	80-82.8%	B-	77-79.9%	C+
73-76.9%	C	70-72.9%	C-	67-69.9%	D+
63-66.9%	D	60-62.9%	D-	0-59.9%	F

Grades will be computed on the basis of points earned on quizzes, homework, lab work (programming), and tests. The weighting is as follows, however you must pass the final exam (60.0% or better) in order to get a C or better in the class.

10%	attendance
10%	reading
30%	labs (programming assignments)
10%	quizzes and homework
20%	tests
20%	final exam
100%	total

5.1 Attendance

I take roll in this class. Attendance counts for 10% of your final grade. Typically attendance is worth 3 points per day. I take 3-point roll at the start of class. I take 2-point roll about 10 minutes into class. If you come later than that, you can get one point by making sure I notice you in class (maybe right after class). Missing and unnoticed persons get zeros.

Due to INS (immigration) and VA (veterans) requirements the Vice President for Student Life is supposed to be notified whenever a student misses four consecutive class days. I try to do this.

5.2 Reading

The book is written for a typical CS student with only a little programming background. It will be too easy for some of you, and too difficult for some of you.

To 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.

After completing the reading, you must submit to GradeBot (see below) a program whose output makes the claim that you did the required reading. The exact wording can be had from GradeBot.

5.3 Programming Labs

There are a number of programming assignments in this class. The emphasis is on learning the chapter material by developing your programming skills, including specification reading, debugging, and documenting your work.

You may also be asked to write programs for quizzes, homework, or tests, but these will be read by a human rather than being compiled and executed by a machine. The emphasis will be demonstrating your understanding of the algorithms and problems discussed in class and in the textbook, rather than on your skill at debugging and testing your work. Accordingly, well-commented pseudo-code is expected.

5.4 Quizzes

The primary purpose of quizzes is to measure student learning on a topic-by-topic basis. It shows me how the

students are doing, and it shows you where you might need more attention before the bigger tests. Quizzes are generally not announced in advance, and can take place at any time.

Quiz Makeup: Because quizzes are a small part of the final grade, they cannot be made up except when I approve it in unusual circumstances.

5.5 Homework

The primary purpose of homework is to encourage students to master the course material in a low-stress setting where resources such as the textbook can be consulted in a leisurely way. It is my policy that **regular homework in this course can be done with the aid of other students, and that answers can be compared.** It is not in anyone's best interest if answers are simply copied from person to person without at least some attempt at understanding. Generally homework means answering questions from the end of each section in the book. **Extra-credit (bonus) homework problems may be assigned from time to time. These add to your homework score, but are not required. Unlike regular homework, these must be done without the aid of other people, except that you can consult books or ask me (the instructor) for assistance.**

Late Homework: Homework assignments are due at the start of class, and should be turned in to me (at the front of the classroom) when you arrive. Typically I like to discuss a homework assignment on the day that it is turned in, or on the day that I return the graded assignment to the students of the class. This often involves disclosing the answers and discussing how the answers were derived. No late work is accepted **after the homework is discussed in class**, except when I approve it in unusual circumstances.

5.6 Tests

Tests are generally given in the testing center on bubble sheets outside of normal class time. Sample tests are available before the real test deadline.

The primary purpose of tests (examinations) is to gauge student learning by measuring performance in a (possibly timed) supervised situation. It is understood that such a situation creates additional stress for many students. For this reason testing is not used exclusively in the grading process. Each test will receive a scaled (normalized) score and a letter grade indicating the final course grade that would be earned by consistent performance at the level reflected on that test.

Test Makeup: Tests cannot be made up except when I approve it in unusual circumstances.

5.7 Final Exam

The final exam is given in a timed and controlled setting. It will review the tests given previously and will include some programming problems to verify your skills demonstrated on the labs.

Even though the final exam may count for just a small percentage of your overall grade, you must pass the final exam (60.0% or better) in order to get a C or better in the class.

5.8 Other notes

I reserve the right to up-scale the scores on any assignment, exam, or whatever, if I feel the absolute numeric grading is too harsh. The transformation may even be non-linear, but in any case, absolute rank order will be preserved and no score will go down.

Whenever you think grading may be unfair or incorrect, I encourage you to discuss specific instances of grading with me, and to argue for a different grade than I initially assigned. Some very good learning occurs in these settings (for you **and** for me). The best time to do this is during my office hours, or immediately before or after class if the issue is brief. As an alternative, you can submit your argument in writing, together with the original graded work.

Final grades are generally issued by email soon after the final exam, or in-person if I feel that some discussion might be beneficial. Students are invited to visit my office to claim any exams or quizzes or homework that I am still holding, and to discuss their academic progress. Interim progress reports are issued to the students several times during the course, about once a month.

5.9 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 time line for completion, and you get the necessary paperwork filled out.

6 Computer Accounts

As a member of this class, or as a CS major, you are entitled to a computer account in the CS lab.

I also provide you with a computer account on the is230.byuh.edu UNIX host. This account helps me administer the grading of my courses.

These accounts give you access to Linux systems, software (including compilers and assemblers), email, web surfing, some storage, and some paper printing. Most

of you will use these accounts to do all the lab work in this class. If you had a CS account recently, it is probably still active. If not, see me or a lab person (GCB 101) to get set up.

7 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 typically done via email.

GradeBot is correct and authoritative. 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 vary from student to student. It will not significantly alter the difficulty of the problem.

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: is230”. 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 “xxx” to GradeBot, the subject line is “Subject: is230 xxx”. 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.

You can also submit programs to GradeBot using the CS “turnin” command. Type “turnin cs235 assignment filename”. Type “turnin cs235 status” to see your grade to date.

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.

8 Do Your Own Work

There are many cultural differences across the students on campus. Some involve the allowable ways in which work is done and submitted. For this course, the requirement is that all work you submit is work you did yourself. You can get help and work in groups, but only to help you UNDERSTAND the assignments. Armed with that understanding, you must then do the assignment yourself.

To help verify you are capable of the work you have submitted, the final exam reviews material covered throughout the semester, including some programming tasks. If you are unable to pass the final exam with a

score of at least 60%, your grade in this class is limited to a maximum of C-, no matter how many points you have earned.

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 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 the TA or me (even me) 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.**

Plagiarism: Submitting computer program code that is copied from others is plagiarism. Exceptions would include code copied from text books and reference books, with appropriate citation indicating the source. I have personally had several students expelled from BYUH for plagiarism.

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. If you have used it as the basis for a program you are writing, you must destroy both the received work and the work done after receiving it.

Except for the textbook, or handouts from me, you are not allowed to possess a copy of any lab program written by someone else until **after** you have earned credit for that lab yourself. If you ever obtain any such copies, you must permanently dispose of them or give them back BEFORE you work on your program again.

Assisting in Plagiarism: 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. Do NOT bring up a window on the second student’s screen so they can look at the first student’s program. Do NOT email them a copy. You can talk about what the program does, and why it is that way. Do NOT leave them with a copy of your program.

You should also protect your computer directories so that newer students cannot steal copies of your work.

9 Assignment Calendar

The dates on this list are not guaranteed. They are approximately correct. You should run a GradeBot status report to find the authoritative, correct due dates for you.

1: ch1	thru Jan 08 (Tue)	6 pts
2: hello	thru Jan 09 (Wed)	10 pts
3: argc	thru Jan 11 (Fri)	10 pts
4: a04	thru Jan 14 (Mon)	3 pts
5: argv	thru Jan 14 (Mon)	10 pts
6: ch2	thru Jan 15 (Tue)	16 pts
7: a05	thru Jan 16 (Wed)	3 pts
8: a06	thru Jan 18 (Fri)	3 pts
9: fac	thru Jan 22 (Tue)	15 pts
10: a07	thru Jan 23 (Wed)	3 pts
11: a08	thru Jan 25 (Fri)	3 pts
12: a09	thru Jan 28 (Mon)	3 pts
13: fib	thru Jan 28 (Mon)	20 pts
14: t09	thru Jan 28 (Mon)	35 pts
15: a10	thru Jan 30 (Wed)	3 pts
16: ch3	thru Jan 31 (Thu)	17 pts
No Class (1)	Feb 01 (Fri)	
17: a12	thru Feb 04 (Mon)	3 pts
18: a13	thru Feb 06 (Wed)	3 pts
19: a14	thru Feb 08 (Fri)	3 pts
20: a15	thru Feb 11 (Mon)	3 pts
21: t15	thru Feb 11 (Mon)	35 pts
22: a16	thru Feb 13 (Wed)	3 pts
23: count	thru Feb 13 (Wed)	10 pts
24: ch4	thru Feb 14 (Thu)	17 pts
25: a17	thru Feb 15 (Fri)	3 pts
26: oswor	thru Feb 15 (Fri)	15 pts
27: a18	thru Feb 20 (Wed)	3 pts
28: choose	thru Feb 20 (Wed)	15 pts
29: a19	thru Feb 22 (Fri)	3 pts
30: owii	thru Feb 23 (Sat)	20 pts
31: a20	thru Feb 25 (Mon)	3 pts
32: a21	thru Feb 27 (Wed)	3 pts
33: t21	thru Feb 27 (Wed)	35 pts
34: do2b	thru Feb 28 (Thu)	25 pts
35: a22	thru Mar 01 (Fri)	3 pts
36: ch5	thru Mar 02 (Sat)	15 pts
37: a23	thru Mar 04 (Mon)	3 pts
38: a24	thru Mar 06 (Wed)	3 pts
39: a25	thru Mar 08 (Fri)	3 pts
40: stack	thru Mar 09 (Sat)	30 pts
41: a26	thru Mar 11 (Mon)	3 pts
42: a27	thru Mar 13 (Wed)	3 pts
43: a28	thru Mar 15 (Fri)	3 pts
44: a29	thru Mar 18 (Mon)	3 pts
45: t29	thru Mar 18 (Mon)	35 pts
46: queue	thru Mar 19 (Tue)	30 pts
47: a30	thru Mar 20 (Wed)	3 pts
48: a31	thru Mar 22 (Fri)	3 pts
49: ch6	thru Mar 23 (Sat)	13 pts

50: a32	thru Mar 25 (Mon)	3 pts
51: a33	thru Mar 27 (Wed)	3 pts
52: a34	thru Mar 29 (Fri)	3 pts
53: a35	thru Apr 01 (Mon)	2 pts
54: bst	thru Apr 01 (Mon)	40 pts
55: a36	thru Apr 03 (Wed)	2 pts
56: t36	thru Apr 03 (Wed)	35 pts
No Class (2)	Apr 05 (Fri)	
57: a38	thru Apr 08 (Mon)	2 pts
58: ch7	thru Apr 08 (Mon)	16 pts
59: a39	thru Apr 10 (Wed)	2 pts
60: zoo1	thru Apr 11 (Thu)	50 pts
61: a40	thru Apr 12 (Fri)	2 pts
62: t41	thru Apr 15 (Mon)	25 pts
* 63: zoo2	thru Apr 17 (Wed)	50 pts
64: q&hw	thru Apr 17 (Wed)	100 pts
65: final1	thru Apr 22 (Mon)	100 pts
66: final2	thru Apr 22 (Mon)	100 pts

Jan 07 2002 (Mon) is your first work day.

Apr 17 2002 (Wed) is your last work day.

Apr 22 2002 (Mon) is your final exam date.

* denotes assignments for Extra Credit.

(1) No class today. I expect to be off-island with the Kahuku High School Speech and Debate team, as a chaperon and tournament judge for a tournament on Kaua'i.

(2) No class today. I expect to be in Kansas City for a board meeting of the Education Special Interest Group (EDSIG) of the Association of Information Technology Professionals.