Syllabus

Note: This information is also available in the App State course syllabus search tool. Click here to see it.

Course Objectives

By the end of the semester, CS 3482 students will be able to:

- decipher X86-64 machine code
- exploit X86-64 machine code buffer overflow vulnerabilities
- express the limitations of the compiler when performing optimizations
- hand-optimize C/C++ code to improve performance
- demonstrate how an address generated during the execution of a program is used to access the physical memory
- explain the possible penalties of memory accesses
- examine C/C++ code to estimate cache performance and rewrite code to improve it
- explain what an exception is and how it can alter normal control flow
- implement C code that responds to exceptions
- demonstrate how virtual addresses are translated into physical addresses
- implement C code for memory management
- demonstrate an understanding of different memory management techniques
- explain the trade-offs between different memory management techniques

Required Materials and Resources

Computer Systems: A Programmer's Perspective, by Randal E. Bryant and David O'Hallaron, third edition.

Grades

Your grade will be determined by the following components:

- Two tests, 15% each
- Final exam, 25%
- Pre-quizzes, 4%
- Exercises/Attendance, 14%
- Labs, 27% (4.5 points per lab assignment)

Final grades are based on a 10 point scale with +/- given within three points of either end of the scale, i.e., 93-100, A, 90-92, A-, 87-89, B+, 83-86, B, 80-82, B-, etc. If your grade falls within this range, you are guaranteed to get at least the grade indicated. Grades on exams, or the course grade, may or may not be curved. The grade of I (incomplete) will only be given in rare circumstances.

Lecture Attendance

It is the policy of Appalachian State University that class attendance is an important part of a student's educational experience. Students are expected to attend every meeting of their classes. However, I do understand that life happens. Attendance will be taken every lecture period. If we are doing an exercise that day, this will be through collecting the exercise at the end of class. If we aren't doing an exercise that day, this will be by means of each student writing their name on an attendance sheet before leaving class. If you do not hand in an exercise or write your name on the attendance sheet, then you will be marked absent. **You can miss up to 4 class meetings with an unexcused absence (see information on excused absences below) without penalty. Each unexcused absence after 4 will result in a 5 point deduction to your final grade in the class.** You will receive a 0 on any exercises given during a missed classes, but your 2 lowest exercise grades will be dropped.

For information about excused absences, see the University policies on attendance here. Beyond the situations mentioned there, I allow excused absences for school related activities (e.g., you may have to be gone because you are traveling for a school club) and being sick enough to go to the doctor (when you do, get a note). Please be proactive and contact me in advance if possible.

Assignment Details

(Pre) Quizzes

You are expected to come to class prepared by watching screencasts and/or going over the slides and/or reading the textbook, and completing an on-line quiz. I will not spend time in class covering concepts that should already be understood by all of the students in the class and instead cover only that material which students typically have difficulty with. It is up to you to ask questions covering quiz topics that you did not understand if I don't cover the material in class.

Exercises

Class time will be spent working on an exercise. These will be given nearly every class period. You can work in teams of two or three on the exercise and then we will go over the answers as a class. Sometimes the exercises will be preceded by a "mini-lecture". Often, a "mini-lecture" will be given while going over the exercise questions. Taking notes will be helpful to you when you later review the material. If you attend class and spend your time working on the exercise (as opposed to looking at your phone, working on something else, etc.) then you will receive full credit on the exercise.

None of the exercises can be made up if you miss class. However, two exercise grades will be dropped.

Lab Attendance

If you miss lab, 50 points will be deducted from your grade on that particular lab assignment (100 points if the lab is a two week lab and you miss both labs). However, you can make up the missed lab time by arranging with me a time to make it up. Please arrange making up the missed lab time in advance of missing the lab. **You must make up the missed lab time before the next new lab assignment. Each lab is a two week lab.** Note that you can attend the other lab section that week if you know you cannot attend your own.

Labs

Lab time will be spent completing a collection of labs (mostly) provided by the textbook authors. Labs will be opened around 9am Tuesday morning and due at midnight two Mondays later (or later if a test is to be given that week or the lab is extended for some reason). When grading a lab assignment, if you are working with someone else, I will be looking for evidence that you both *actively* worked on it. Note that GitHub tracks number of commits and number of lines of code committed. It should reflect an equal amount for both of you. If you work with someone else, you and your partner must be able to attend the same lab section. You do not need to be registered for the same lab section.

Tests

If for some reason, you can not attend class the day of a test, you **must** warn me beforehand, you will receive a 0 on that test. Tests generally take an hour or more and therefore will be scheduled during lab times. Tests will not be cumulative. Tests will cover the same material as covered by the quizzes and exercises, thus your best bet for doing well on tests is to earn good grades on pre-quizzes and exercises.

Final

The final exam will be cumulative. The final exam is scheduled for **Tuesday, December 8, 2-4:30pm.** This is the official exam slot that corresponds to our lab time, so nobody should have a time conflict.

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