## Course Summary

This course covers the concepts underlying all computer systems and how they affect the correctness, performance, and utility of application programming. We will cover, in particular, information representations, program representations and execution, and the memory hierarchy.

## Learning Objectives

Upon successful completion of this course, students should be able to:

- Use C's bit operators to manipulate data
- Simulate the execution of various x86 assembly instructions
- Explain how a buffer overflow attack works as well as carry one out
- Reverse engineer parts of a compiled program to understand what it is doing
- Correctly use pointers in the C language

## Prerequisites

The prerequisites for this course are data structures (CSC300, CSC383, or CSC393) and discrete math (MAT140).  The assumption is that you are already familiar with structural programming concepts like branching, loops, functions, arrays, etc.

## The C programming language and the UNIX environment

We will be using C and UNIX extensively in this course; however, it is not the purpose of this to teach you C and UNIX.  This course requires you to read, understand, and sometimes write small programs in C and to interact with a Linux server.  I will provide a very brief introduction just to get you started, and I will answer questions about C and Linux in class, but students are expected to pick up C and UNIX on their own.  This will require a great amount of time reading the C text for the course, interacting with the Linux server, writing and debugging programs, and looking things up in UNIX and C manuals.

## Grading Policy

Your overall grade for the course will be computed as follows:

| | |
|---|---|
| Labs (homework) | 40% |
| Online quizzes | 20% |

Midterm exam          20%
Final exam            20%

Letter grades will be assigned according to the table below; however, the instructor reserves the right to adjust the scale in the student's favor.  In other words, the table indicates the minimum letter grade you will receive for the given overall percentage.  You may receive a slightly higher grade if the instructor feels an adjustment is necessary.

93-100  A
90-92   A-
87-89   B+
83-86   B
80-82   B-
77-79   C+
73-76   C
70-72   C-
67-69   D+
60-66   D
0-59    F

## Textbooks and Printed Resources

*Computer Systems: A Programmer's Perspective, 2nd Edition*.   Bryant & O'Hallaron, Prentice Hall/Pearson, 2011.   ISBN: 978-0136108047

*The C Programming Language, 2nd edition*.   Kernighan & Ritchie, Prentice Hall/Pearson, 1988.   ISBN: 978-0131103627

## Lab Projects

The heart of this course are the labs that students will be doing. Each of these labs requires a significant amount of time and work to complete. They really are projects and not homeworks. Students are urged to start early. Each lab has multiple pieces and is automatically graded so you can check your progress as you go. Note that late submissions will not be accepted.  So submit early and often.  Partial credit is better than no credit.

All labs are individual work. Students are expected to solve the problems on their own. Searching for answers to the problems online is considered cheating and will result in an F for the course. You are certainly welcome and encouraged to seek help with how to use the various tools. If you are ever unsure about whether some reference/resource is allowed, please just ask.

## Quizzes

Quizzes will be handled online on the D2L site for the course.  Quizzes must be completed before 1:30PM server time on the due date.  Late quizzes will <u>not</u> be accepted and will receive a grade of 0, so make sure to finish them early and to save your work as you finish each problem.

## Exams

The midterm exam is on Thursday,  October  16, at the usual class time. Online students must take the midterm exam either on October  16 or October 17. The final exam is on Thursday, November 20, at 11:45AM in the usual classroom. Online students must take the final exam on either November 20 or November 21. Clear your schedule now.

<u>In class students:</u>  Both exams will take place in the regular classroom.

<u>Online students:</u>  Make sure to register for the exam on D2L. If you are a local student you must make arrangements to take the exam at a DePaul campus.  If you are not local, you must arrange for a proctor. All online students should be familiar with their rights and responsibilities as outlined here:

http://www.cdm.depaul.edu/onlinelearning/Pages/Policies-and-Resources.aspx

Students may bring a single 8.5" by 11" sheet of notes (both sides) to the exams, but no other resources will be allowed. The sheet of notes must be turned in with the exam and will not be returned. Please make a copy for yourself before bringing it to the exam.

## Warning to OL students

In the past, I have had remote students who thought they were registered for the OL section. When it came time to take the exams, administration would not allow them to take the exam remotely and so they received a 0 for the exams. Make sure this does NOT happen to you!  Check now on D2L to see if you have the option of register for a proctored exam.

## Course Server and Required Software

All lab work must be done on the UNIX server for the course. This will require you to have some kind of terminal/telnet application as well as an FTP application that uses SSH. You can find a link to PuTTY in the Content section of D2L. You will need both PuTTY and PSCP.

The hostname is wmarrero2.cstcis.cti.depaul.edu. Your username is the first letter of your first name followed by at most the first 7 letters of your last name. Your password is your DePaul student ID including leading zeroes if there are any. Please change your password as soon as you login by typing in "passwd" (without the quotes) and then following the instructions.

Accounts will be generated from the class roster on September 11.  If you cannot login, contact the instructor ASAP especially if you registered late for the course. You may not have an account yet.

You will also need to become familiar with its text/terminal based tools, including the editor (either emacs or vi), the compiler (gcc), and the debugger (gdb). See the Reference Documents module under Content on D2L if you are unfamiliar with these tools or with the UNIX command line interface.

Please be aware that I may look at the files under your account on the server. Please do not place anything on the server that is not related to the course or that you do not want me to see.

## Email

Email is the primary way I communicate with students outside of class. To make email communication as smooth as possible, please make sure to do the following:

- Students should be sure their email listed under "demographic information" at http://campusconnect.depaul.edu is correct. All my emails to you will go to that address. When I reply to homework questions, I reply to the whole class and so the reply gets sent to your campus connect email address and not necessarily to the one from which you sent me the question.

- Send questions from an email address that identifies who you are. You have the best chance of getting through the email spam filter if you use your DePaul email address. You have the greatest chance of the email being filtered or of me ignoring it if you send it from an address that I cannot recognize immediately as a student in my class. (I once had a student send me email from way2sexy@hotmail.com and complain 2 weeks later that I wasn't answering his email.)

- Include the course number in the subject of all emails. If I receive an email from you without the course number (CSC373) in the subject, I will not notice that it is from a student and there will be a delay in receiving a reply. If I do not recognize what course you are in, I will not waste time looking up which course you are in, I will simply reply asking you which course you are in. This will of course add to the delay in getting your question answered, so just avoid all this and include the course number in the subject line.

- If your question was answered in the lecture or in another email, I will simply refer to the lecture or email. So if you did not understand something I said in class or in an email, be specific. Point out exactly what you didn't understand in my prior communication so that you don't get the generic reply of watch the video/read the email.

## Supplemental Instruction

This class was selected to participate in DePaul's Supplemental Instruction (SI) Program. Supplemental Instruction is a series of weekly review sessions designed to help students succeed in their academic pursuits. SI is provided for ALL students who want to improve their understanding of course material and improve their grades. Our supplemental instructor is Jon Pitzen.

The sessions offer a chance to meet with people in your class to compare notes, discuss important concepts, develop strategies for studying mathematics, and test yourselves before quizzes and exams. At each session you will be guided through the material by your SI leader, a student who has previously taken the course and done well.

Each week, the SI leader will conduct two one-hour study sessions. You may attend any of the sessions that fit into your schedule.

## Online Teaching Evaluation

Evaluations are a way for students to provide valuable feedback regarding their instructor and the course. Detailed feedback will enable the instructor to continuously tailor teaching methods and course content to meet the learning goals of the course and the academic needs of the students. They are a requirement of the course and are key to continue to provide you with the highest quality of teaching. The evaluations are anonymous; the instructor and administration do not track who entered what responses. A program is used to check if the student completed the evaluations, but the evaluation is completely separate from the student's identity. Since 100% participation is our goal, students are sent periodic reminders over three weeks. Students do not receive reminders once they complete the evaluation.

## Email

Email is the primary means of communication between the instructor and students enrolled in this course outside of class.  All students must make sure that the email address listed for them under "demographic information" on campus connect is correct.

## Changes to Syllabus

This syllabus is subject to change as necessary during the quarter.  If a change occurs, it will be thoroughly addressed during class, posted on D2L and notice sent via email.

## Online Course Evaluations

Evaluations are a way for students to provide valuable feedback regarding their instructor and the course. Detailed feedback will enable the instructor to continuously tailor teaching methods and course content to meet the learning goals of the course and the academic needs of the students. They are a requirement of the course and are key to continue to provide you with the highest quality of teaching. The evaluations are anonymous; the instructor and administration do not track who entered what responses. A program is used to check if the student completed the evaluations, but the evaluation is completely separate from the student's identity. Since 100% participation is our goal, students are sent periodic reminders over three weeks. Students do not receive reminders once they complete the evaluation. Students complete the evaluation online in CampusConnect.

**Academic Integrity and Plagiarism**

This course will be subject to the university's academic integrity policy. More information can be found at http://academicintegrity.depaul.edu/. If you have any questions be sure to consult with your professor.

**Academic Policies**

All students are required to manage their class schedules each term in accordance with the deadlines for enrolling and withdrawing as indicated in the University Academic Calendar.  Information on enrollment, withdrawal, grading and incompletes can be found at:  cdm.depaul.edu/enrollment.

**Students with Disabilities**

Students who feel they may need an accommodation based on the impact of a disability should contact the instructor privately to discuss their specific needs. All discussions will remain confidential.
To ensure that you receive the most appropriate accommodation based on your needs, contact the instructor as early as possible in the quarter (preferably within the first week of class), and make sure that you have contacted the Center for Students with Disabilities (CSD) at: csd@depaul.edu.

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