

## CSE 20211 – Fundamentals of Computing – Fall 2013

**Course Website:** <http://www.nd.edu/~dthain/courses/cse20211/fall2013>

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### Overview

This course is the first semester in the Fundamentals of Computing sequence for computer science majors. In this course, students will learn how to formulate algorithms, apply basic problem solving strategies, and apply techniques to different problem domains. The programming assignments are the main component of the course, where students will spend a significant amount of time learning the craft of programming and problem solving. The assignments are also designed to give students a “tour” of computer science, touching on algorithms, data processing, simulation, languages, graphics, and more. This course will be a lot of work and also a lot of fun.

### Course Outcomes

To successfully complete the course, students must be able to:

- Demonstrate basic proficiency in the C programming language.
- Formulate algorithms to solve basic computational problems.
- Construct larger programs by identifying and solving sub-problems.
- Apply basic concepts of software engineering.
- Apply pointers, arrays, and structures correctly.
- Apply dynamic memory allocation correctly.
- Apply basic I/O operations to read and write data files.
- Understand the basic concepts of algorithmic complexity.
- Apply basic architectural concepts to program design.
- Demonstrate a basic understanding of the C++ programming language.

### Textbook

Deitel and Deitel: C: How to Program, 7<sup>th</sup> edition. **(Required)**

(Note: The 6<sup>th</sup> edition can be used, however, the optional review problems won't match up.)

## Weekly Structure

Monday	Introduce New Topic in Lecture
Mon-Wed	Start Programming Assignment in Lab
Wednesday	Continue Topic in Lecture
	Continue Assignment on Your Own
Friday	Applications and Practical Session
Monday	Assignment Due at Noon

Assignments will have several parts. The first parts will consist of simpler exercises to demonstrate that you can reproduce what you have learned from the book and the lecture. The latter parts will be open-ended exercises that ask you to write a program that solves a non-trivial problem, making use of the same techniques. Use your creativity and write programs that reflect your interest and skills!

## Meeting Times

Lecture:	138 DeBartolo	Mon, Wed, Fri	9:35 – 10:25
Labs:	Cushing 303	Monday	3:00 – 3:50
	(Pick one)	Monday	4:00 – 4:50
		Tuesday	2:30 – 3:20
		Wednesday	1:55 - 2:45
Office Hours:	Prof. Thain in 382 Fitz	Tue, Thu	2-4 PM (or by appointment)
	TAs in 149 Fitzpatrick	Mon-Thu and Sun	evening hours TBA

## Getting Help

Many of the assignments will be challenging; you should not hesitate to get help if you are stuck on a technical problem. Both the instructor and the TAs have office hours throughout the week, and no appointment is needed to stop by. You may also post questions or problems to the CSE 20211 Piazza group, and the instructor or TAs will respond when they are able, typically on weekday afternoons or evenings. For grading or personal issues, please contact the instructor by email.

## Where to Find Linux Machines

- Cushing 303 is available anytime a class is not scheduled, usually after 5PM.
- Fitzpatrick 149 (Engineering Library) is open 24 hours, swipe card late at night.
- Stinson-Remick 105 and 216 have a small number of Linux machines.
- At all hours, you may access any of the following machines remotely using the secure shell protocol (use ssh on Linux/Mac or Putty on Windows)
  - student[00-03].cse.nd.edu
  - remote[201-208].helios.nd.edu

You may use your laptop or personal computer to work on assignments for this class. However, be warned that operating systems and compilers can vary in subtle ways, so a program that works on your machine may need some minor changes before it runs on the ND machines, or vice versa. Your work will

be graded on the ND Linux machines, so leave some extra time to copy your program to the ND machines and verify that it compiles and runs correctly before turning it in.

### **Attendance and Time Management**

To succeed in the class, you should attend all lectures and lab sessions. If you happen to miss class for a minor illness or other reason, please obtain notes from another student in the class. We don't take attendance or give excused absences. Class participation points are earned as follows:

1 point – Complete the first part of an assignment during lab, and show it to the TA. (one per week.)

1 point – Stop by Prof. Thain's office hours once during the semester. (max one point.)

1 point – Volunteer for an occasional classroom exercise during lecture. (max one point.)

Your class participation grade is (points earned / 10), so you can earn a few extra credit points this way.

Programming is a time-intensive activity. Programming is best done in a state of 'flow' when you are concentrating on the problem at hand for an extended period of time without distractions. Expect to use the lab sessions as an opportunity to get started on your assignment, typically completing the first one or two sections in lab. Especially as the assignments become more difficult, expect to spend several hours in the lab on your own time during the week. If you get stuck, you may find it helpful to put the work down, think about it, talk to the instructor or the TA, and return to it later. Both Prof. Thain and the TAs are available throughout the week to assist you.

Most assignments will be due at Monday on noon, but you are strongly encouraged to complete them earlier in the week when more help is available. "Last call" for help with the assignment is the end of office hours on Sunday evening.

### **Grading**

The final grade will consist of the following components:

55 percent – Programming assignments

20 percent – In-class exams

20 percent – Final exam

5 percent – Participation

Any request to regrade an item should be submitted to Prof. Thain by email within one week of receiving the grade. Factual or clerical errors will be cheerfully corrected. Matters of judgment are unlikely to be modified. After one week, grades are final.

**Late assignments are not accepted; turn them in well before the deadline.**

**There are no makeup exams; be in the right place at the right time.**

In grave circumstances, exceptions will be made according to the rules outlined in the Notre Dame duLac student handbook.

## On Collaboration and Academic Honesty

As a Notre Dame undergraduate, you have already agreed to abide by the ND Honor Code:

<http://honorcode.nd.edu/>

In this class, you are encouraged to seek out help from other students, from other books, and from sources on the Internet. However, the end goal of any such collaboration is for you to **understand the principles so that you can do the work yourself**. Any programming or written work must flow from **your** brain through **your** fingers to **your** computer. Submitting someone else's work as if it were your own will result in a referral to the honor committee, where penalties include failure of the course and dismissal from the University. To clarify, some examples are:

- Discussing concepts and algorithms with others is permitted.
- Helping each other to understand an error message or debug a problem is permitted.
- Looking up the documentation for a function on the Internet is permitted.
  
- Copying code or solutions from others (regardless of their permission) is **not** allowed.
- Writing code or completing homework for someone else is **not** allowed.
- Copying a program (or part of a program) from the Internet is **not** allowed.

If you aren't sure whether a certain form of collaboration is allowed, you should assume that it is not, until you consult with the instructor.

## Lecture Capture System

This semester, we are experimenting with a lecture capturing system. An automatic camera will record each lecture session and make it available for review online. The video will only be accessible to students within the class for the purposes of reviewing old material.

Because we will be recording in the classroom, your questions or comments may be recorded. Video recordings will typically only capture the front of the classroom. If you have any concerns about your voice or image being recorded, please speak to me to determine an alternative means of participating. No recordings will be shared with individuals outside of your class without your express permission.

You may watch recordings on your computer, tablet or smartphone. These recordings are jointly copyrighted by the University of Notre Dame and your instructor. Posting them to another website, including YouTube, Facebook, Vimeo, or any other site is not permitted.

If you have any comments or concerns about the videos, especially ideas for improvement, please share with me at any point during the semester.