

CS 152

Computer Programming Fundamentals

Brooke Chenoweth

University of New Mexico

Spring 2024

Contact Info

Instructor: Brooke Chenoweth

Email: bchenoweth@cs.unm.edu

Office: Room 2060 in Farris Engineering Center

Web site: cs.unm.edu/~bchenoweth/cs152

Schedule — Lectures (required)

- 10:00 am - 10:50 am
- MWF
- Centennial Engineering Center 1041

Schedule — Labs (also required)

Lab (CRN)	Time	Day	Location
001 (32289)	11:00 am - 11:50 am	M	Mechanical Eng 220
002 (32290)	11:00 am - 11:50 am	W	Mechanical Eng 210
003 (32291)	11:00 am - 11:50 am	F	Mechanical Eng 220
004 (32292)	12:00 pm - 12:50 pm	M	Cent Eng Center 1032
005 (60023)	12:00 pm - 12:50 pm	W	Mechanical Eng 220
006 (36404)	12:00 pm - 12:50 pm	F	Cent Eng Center 1032
007 (44039)	9:00 am - 9:50 am	W	Cent Eng Center 1028
008 (60329)	9:00 am - 9:50 am	F	Cent Eng Center 1028

Each lab session will have some sort of in lab exercise as well as time for questions and course help.

Office Hours

- Office Hours: TBA
I've posted a survey on Canvas to find the classes preferences for days/times, remote vs in person, before choosing my office hours. Hours will be posted on the course website once determined.
- You may attend regular office hours without an advance appointment. If you want to meet at another time, make an appointment by email.
- Section leaders have office hours, too! (TBA, Check course website)
- Feel free to ask any of the section leaders for help.

Grading

- 50% Programming Assignments
- 40% Exams (midterm and final)
- 10% Lab exercises, quizzes, and participation
 - Quizzes and surveys are on Canvas
 - Lab section exercises are in person, but may also have a component to submit on Canvas.

Assignments and Projects

- Assignments must be submitted in Canvas to receive credit.
- It is your responsibility to make sure you submit the correct file.
- Don't wait until the last minute to submit.
- Submit early, submit often!

Extension Days

- Ideally, you'll never need to turn in an assignment late.
- However, life happens!
- You have 10 extension days to spend through the term.
- Max 3 days per programming assignment.
- Use them wisely.

ARC Accomodations

- The Accessibility Resource Center provides accomodations with students with disabilities.
- For example: Extra time and/or quiet location for exams
- <http://arc.unm.edu>
- Please take advantage of their services if applicable

Canvas

- <http://canvas.unm.edu>
- Assignment submissions
- Discussion forum
- Surveys and quizzes
 - Welcome quiz/survey is there now!

Working Together

- Working together and helping one another on all projects is highly encouraged. This includes discussion of:
 - project specification
 - algorithms
 - data structures
 - test cases
 - **Not code!**
- Do *not* share code.
- It is considered cheating to leave your code (paper or electronic copies) where others can find it. You responsible for the security of your intellectual property.

Cheating

- Don't cheat.
- Using books, websites, other people as resources is expected, but document it.
- If unsure, talk to us first.
- Understand your code!
- Trying to “help” a friend by sharing your solution is also cheating.

Topics

- Variables
- Basic program flow
- Conditional branching (if statements)
- Loops (for, while)
- Arrays
- Input/Output
- Objects and classes
- Basic graphics

Summary

- Go to class and labs
- Keep up with the websites
- Expect some sort of work each week
- Be proactive!
- Form study groups
- Ask questions
- The instructors are there to help you

To do

- Visit course website
 - Slides will be posted after the lecture.
- Visit Canvas site
 - Take welcome quiz and office hours survey
 - Visit discussion forum, introduce yourself
- Contact ARC if you might need it

Computing

- In the computer, it is all just numbers.
- A computer file is just a sequence of 1s and 0s.
- Computers do simple things
 - Set the intensity of the red, green and blue light given off by a particular pixel on a display.
 - Send a precisely timed sequence of hi and low voltage values to a hard disk controller, USB port, or wireless transmitter.
 - Add, Subtract, Multiply or Divide two numbers.
 - Read or Set the voltage state of a particular memory circuit.

Complexity from Simplicity

- The complex things we see computers do are the results of programs.
- Even “short” programs are huge and complex lists of simple computer instructions.

Programming Language

- A *programming language* is a set of symbols and rules designed for humans to more easily represent computer instructions.
- In this class, the programming language we will be using is Java.

Computer Programs and Recipes

- Like a recipe, say for cooking quiche, a computer program is a sequence of steps.
- In a recipe, conditional logic, if it exists at all, is trivial. For example:
 1. Bake for 50 minutes.
 2. Remove from oven.
 3. Insert a knife into the center and remove. If bits of egg cling to the knife, then return quiche to oven and bake for another 10 minutes.
 4. Repeat this until the knife comes out clean.
- In a computer program, it is common for there to be 100s or 1000s of conditions with complex nestings and other interrelations.

Programming vs Natural Language

- The entire Java vocabulary consists about 50 reserved words.
- There are many Java *classes*, such as `Math` and `Image`. However, these are the *proper nouns* of the language.
- A person can be fluent in a language without knowing the vast majority of its proper nouns.
- Proper nouns are learned as needed, and can be forgotten when no longer needed.
- Like natural languages, programming languages have punctuation and syntax rules (e.g. In Java, every statement is ended with a semicolon). Programming languages, however, have fewer rules than natural languages.

Small Language with Complex Usage

- Programming Languages are much smaller and easier to learn than natural languages.
- However, programming languages are primarily used to express complex branchings of conditional logic that far surpass common uses of natural languages.
- Logic skills have strong carryover from one programming language to another.