

Computer Science 363
Programming Languages
Fall 2017

Instructor: Chris Healy

My office is located in Room 200-I in Riley Hall. My office hours are MWF 9:30-12:20, TR 1:00-2:15, and also by appointment. Please see me if you ever have any questions during the course. Office phone number 294-2233 and e-mail address chris.healy@furman.edu

Class Meetings

MWF 12:30-1:20 in Room 31 in Plyler Hall. Labs are held Thursdays 2:30-4:30 in Room 203 in Riley Hall.

Purpose

In this class we will study the general principles of programming languages. We will explore the following questions.

- What is a programming language?
- What does one consist of?
- How do we define one?
- How do we implement one?
- How do we know that code written in some language is correct?

Along the way, we will revisit in more depth some topics you may have seen in earlier classes such as:

- variables
- data types
- control structures
- parameter passing
- expression evaluation

With a course title of “programming languages,” you might expect the labs to feature a different programming language each week. But actually this is not the case. Instead, the labs will investigate various behind-the-scenes issues, for example – language syntax, internal representation of a program, register allocation, computing the size of a variant record, and observing the run-time stack.

Web site

Notes and handouts can be found here: <http://cs.furman.edu/~chealy/cs363>

Textbook

Programming Language Pragmatics, fourth edition, by Michael Scott, published by Morgan Kaufmann, 2016. We will cover chapters 1-4, 6-9 and 11.

Grade calculation

- 10% Labs
- 30% Homework
- 15% Test #1 Friday, September 29, 2017
- 15% Test #2 Friday, November 10, 2017
- 30% Final Thursday, December 7, 2017, 12:00-2:30

Please note the dates/times of these exams. Any appropriate documentation supporting special arrangements necessary for any test must be given to me during the first week of class.

Attendance

Studies of college students have shown that class attendance is one of the strongest predictors of academic success. Furman's attendance policy states that you cannot pass a course if you miss more than one-quarter of the class meetings. If you miss a test, you will earn a score of zero, unless your absence is excused. If you know in advance that you cannot take a test, please let me know as soon as possible so that you can take it early. Otherwise, if you are absent from a test due to an excused absence, then your final exam grade will substitute for that test's score.

Preparation

You will need to study about 6 hours per week for this class. Study includes reviewing notes, becoming acquainted with the material to be discussed in the next class, completing labs and homework assignments, and preparing for exams. Studying on a consistent schedule each day will work far better for you than cramming before a test. Don't forget the most important thing – I am here for you. Please come to my office anytime for help or advice in this course.

Homework

There will be programming assignments during the term in which you will investigate features in more depth than in the labs. Programs that are submitted late will be penalized one letter grade per weekday. These assignments are to be done strictly on an individual basis. Collaboration on homework will be treated as plagiarism.

Guiding principles for students in Computer Science classes

1. We are here to learn and explore.
 - a. Seek discussions with the instructor and classmates about the material to reinforce your understanding and practice communicating ideas.
 - b. Have fun. Live in the moment (i.e. don't dwell too much on the difficulties of yesterday or tomorrow). Enjoy the journey and intellectual feast. Be enthusiastic about what you are doing.
2. You can be successful in this class. Every day is an opportunity for an epiphany. Don't let mistakes or setbacks hold you back. After some effort, things can suddenly click in your mind.
3. Learn by doing, not just passively reading, listening or watching.
Each study period needs to have a clear goal.
Pay attention to the big picture and the facts that you are collecting.
4. Be organized: Take notes on what you read. Review earlier material as needed. Create a cumulative study outline every few weeks. Maintain a portfolio of your work.
5. Be patient when solving a homework or lab problem.
 - a. There is no need to rush.
Don't worry if your first attempt at a solution is wrong.
Read all instructions and be methodical.
Take time to gather your thoughts.
Deliberately write out your thought process and plan of attack.
 - b. A computer program or other homework assignment may take up to several hours to complete. In programs you need to comment your code as you go, because you will quickly forget what looks obvious right now! Realize that you don't need to finish everything in one sitting.
 - c. Break up large problems into small, more manageable pieces.
 - d. Don't get bogged down with too many mechanical details. Computing is all about removing tedium from routine tasks.
6. Be curious, and always ask questions.
 - a. Find a topic or application that you are enthusiastic about.
 - b. Consider alternative solutions to a problem.
 - c. When finishing a problem, ask yourself if this problem or its solution lends itself to other problems.
7. Computer science is about logic, structured thinking, information, communication and problem solving. Thus, it has connections to many other fields in the sciences, humanities and social sciences. You will find the analytical techniques useful in your career.

Tentative pacing schedule

Week	Days	Activities
1	-- 23 - 25	Chapter 1 (introduction)
2	28 - 30 - 1	Chapter 2 (syntax) Homework #1 assigned Friday
3	-- 6 7 8	Chapter 2 Lab #1 on Thursday
4	11 - 13 - 15	Finish Chapter 2 and start Chapter 3 (names, scopes, bindings)
5	18 - 20 21 22	Finish Chapter 3 Lab #2 on Thursday
6	25 - 27 28 29	Start Chapter 4 (semantic analysis) Homework #1 due Monday Review on Thursday Test #1 on Friday
7	2 - 4 5 6	Finish Chapter 4 and start Chapter 6 (control flow) Lab #3 on Thursday
8	-- 11 - 13	Continue Chapter 6
9	16 - 18 - 20	Finish Chapter 6 and start Chapter 7 (type systems) Homework #2 assigned Monday
10	23 - 25 - 27	Finish Chapter 7 and start Chapter 8 (composite types)
11	30 - 1 2 3	Finish Chapter 8 Lab #4 on Thursday CCSC-SE conference on Friday
12	6 - 8 9 10	Start Chapter 9 (subroutines and parameters) Homework #2 due Monday Homework #3 assigned Wednesday Review on Thursday Test #2 on Friday
13	13 - 15 16 17	Finish Chapter 9 Lab #5 on Thursday
14	20 - - - -	Start Chapter 11 (functional programming)
15	27 - 29 30 1	Finish Chapter 11 on Monday Homework #3 due Wednesday Lab #6 on Thursday Presentations begin Wednesday
16	4 - (6) 7 -	Presentations conclude on Monday Final Exam on Thursday 12:00 - 2:30