

CS 110: Imperative Problem Solving

Syllabus – Fall 2020

Instructor: Nathan Sommer

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Office Location: Taylor 313

Office Hours: See course web site

Meeting Time: 9:15 AM to 10:05 AM in Taylor 200 or on Microsoft Teams

Course Web Site: csweb.wooster.edu/nsommer/cs110

Course Description

This course emphasizes the imperative view of problem solving, supported by problem solutions implemented in the C programming language. Topics include: procedural design, algorithm development for various problems, recursion, the fundamentals of C and its standard library, pointers and addressing, binary number representation, and the distinction between stack allocated and heap allocated memory.

Course Goals

Upon completion of this course, a successful student will be able to:

- Design and implement small to mid-sized programs in C using appropriate imperative programming design principles.
- Understand the memory model of a C program during execution.
- Use the basic functionality of Git.

Course Prerequisites

CS 100 or CS 102

Textbook

The textbook is available online. Feel free to buy a physical copy if you like, but it is not required. See the course web page for a link to the book.

- *Programming in C, Fourth Edition* by Stephen G. Kochan.

Learning Amidst COVID-19

The current pandemic obviously has a dramatic effect on how we will conduct classes this semester. I will do my best to create a conducive environment for learning in the face of this challenge, but this environment is new to us all and some adjustments to the course may be made as we go along. Let us all practice patience and kindness towards one another as we figure things out together.

Once the College starts allowing us to meet in person, we will not all be able to be in the classroom at the same time due to social distancing. Thus those who would like to attend in-person class sessions will be divided into groups and do so on a rotation, while the rest of the class attends remotely via Microsoft Teams. These groups will be formed closer to the time that we begin in-person class sessions. In the meantime, all class sessions will be held via Teams.

Recording of Classes

I plan to record some of our class sessions within Teams so that students can review the content at a later time, and students who have to miss class for exceptional circumstances can catch up more easily. These recordings will only be accessible by class participants, and they may not be distributed beyond this class in any form without the permission of all participants. You will be notified when recording is taking place.

Updated Pass-Fail Option

Due to the current circumstances, the College has broadened its pass-fail grading policies this semester:

- Students may elect a Pass-Fail grading option for any course (including those in a major/minor)
- Special note on transcript noting unique policy changes specific to Fall Semester 2020 regarding pass-fail counting toward the major.
- Students may elect as many courses as they wish on a Pass-Fail grading structure. Courses elected as Pass-Fail for Fall Semester 2020 will not count toward the maximum number of Pass-Fail courses that a student may take at Wooster.
- The deadline for electing a Pass-Fail grading option is Friday, Dec. 18, 2020 @ 4 p.m.

See here for additional information about updates to academic policies:

<https://www.wooster.edu/info/fall-2020-guide/2020-21-calendar/>

Course Outline

The exact schedule of the course will depend on our rate of progress through the material. Below is an outline of topics, roughly in the order that we will cover them. See the course website for the current schedule.

- Compiling and Executing C Programs

- Variables and Data types
- Loops
- Conditionals
- Functions
- Arrays
- Structs
- Strings
- Pointers
- Reading and Writing Files
- Dynamically Allocated Memory
- Recursion
- Binary Number Representation

Assignments and Exams

Your grade will be calculated based on the following items:

- **Quizzes** – I will be using a flipped classroom model for this course. This means that I will generally not lecture during class sessions. Instead, you will watch videos and read materials between class sessions. In class we will discuss the concepts from the videos and reading, and then apply the concepts through programming exercises.

To assess whether or not you are engaging with the materials outside of class, there will be regular quizzes on Moodle which are to be completed before the class session in which the concepts are applied. Quizzes will close at 9 AM on the day of class.

- **Attendance and Engagement** – You are expected to attend the synchronous class sessions and to participate in activities and group discussion.
- **Programming Exercises** – Programming exercises will be assigned regularly throughout the semester. Often you will work on these exercises during class time, where the ZI and I will be available for help. When we are in-person, please bring your laptop to class so that you can work on these exercises.

You will not always be able to finish these exercises during the class session. Exercises that are assigned during a particular class session will typically be due by the start of the next class session.

Most of the programming exercises will be automatically tested by git-keeper, a server that will run tests against your code and email you the results. Grades for these exercises will be based on the test results and sometimes the style and organization of your code.

You are responsible for ensuring that assignments are submitted correctly. You will always receive an email from git-keeper when your submission has been received successfully. If you

do not receive an email and you are certain you pushed your submission and there were no errors on your end, contact me.

- **Projects** – These assignments will be more involved than the programming exercises, and you will be given more time to complete them. Completion time and grading will vary from project to project.
- **Midterm Exams** – There will be 2 midterm exams during the semester. These will be take-home exams and will consist of a set of questions on Moodle and a set of programming problems submitted to git-keeper. See the schedule on the course web site for the timing of these exams.
- **Final Exam** – There will be a cumulative final exam given during the College's final exam period.

Grading

Grades will be weighted as follows:

- 10% Quizzes
- 5% Attendance and Engagement
- 40% Exercises and Projects
- 25% Midterm Exams (2 @ 12.5% each)
- 20% Final Exam

I will use the standard 90, 80, 70, 60 grading scale with pluses and minuses. I may relax these standards as necessary but I will not raise them.

Communication

Feel free to talk to me about any issues that may arise. The preferred means of communication about course material is via direct message on Microsoft Teams. If you are struggling with specific programming assignments, it is generally most effective to talk via a video call so that you can share your screen with me.

You may book a time to meet with me during my office hours using the booking link on the course web site. If there are no spots free or you cannot make my normal office hours, let me know and we can figure out another time to meet.

Course Policies

- **Assignment Submission** – Most programming exercises and projects will be distributed through git-keeper. For these assignments, submission through git-keeper will be the only acceptable means of submission unless I indicate otherwise. Some assignments may be distributed and collected via Moodle as well.

- **Late Policy** – I will do my best to grade and return assignments to you as soon as I can. Late submissions make timely grading much more difficult. As such, any submissions I receive after I have started grading an assignment will be subject to a 25% penalty for each day that it is late, starting as soon as I start grading the assignment.

If an assignment's due date has passed and I want to start grading submissions but *nobody* has submitted, the 25% penalty starts at that point regardless of the fact that there is nothing to grade.

Exceptions to this policy will be granted in special circumstances. You must let me know *before* the due date if you feel you have a valid reason why you cannot turn an assignment in on time.

- **Extensions** – I will extend an assignment's due date for the entire class if it is clear that the original time frame was unreasonable. If you are going to bring up the possibility of a due date extension for a programming project, be prepared to demonstrate that you have already made substantial progress on the project.

I will grant personal extensions under the right circumstances. If you would like an extension for personal reasons, send me an email or come see me in my office.

- **Absences** – You are expected to attend each class, but I understand that exceptional circumstances arise. If you miss a class or know that you will miss an upcoming class, please contact me as soon as possible so we can discuss the situation.
- **Academic Honesty** – You are encouraged to discuss programming exercises and projects with other students. However, any uncited work you turn in must be your own.

Software similarity is a tricky thing as some similarities between code submissions are inevitable. I draw the line at submissions that contain a significant amount of code that is either identical to someone else's code or submissions where the only differences are purely cosmetic (i.e. variable and function names have been changed to hide code copying). If in doubt, put a comment in your code citing a source or acknowledging collaboration. Contact me if you have any doubts about what is permissible.

Dishonesty in any of your academic work is a serious breach of the Code of Academic Integrity and is grounds for an F for the entire course. Such violations include turning in another person's work as your own, copying from any source without proper citation, crossing the boundary of what is allowed in a group project, submitting an assignment produced for a course to a second course without the authorization of all the instructors, and lying in connection with your academic work. You will be held responsible for your actions.

You are expected to know and abide by the rules and policies of the institution as described in the documents available here:

<https://www.wooster.edu/offices/academic-affairs/policies/>

- **Final Exam** – No final examinations are to be given during the last week of classes or on reading days. Students who wish to reschedule a final exam must petition the Dean for Curriculum and Academic Engagement in writing in advance of the examination. The student must confer with the instructor before submitting a petition, and the instructor should indicate to the Dean if he or she supports the petition.

Normally, such petitions are granted only for health reasons. If other reasons necessitate a request for a change in a final exam, the request must be submitted three weeks in advance of the examination.

- **Conflicts with Academic Responsibilities** – The College of Wooster is an academic institution and its fundamental purpose is to stimulate its students to reach the highest standard of intellectual achievement. As an academic institution with this purpose, the College expects students to give the highest priority to their academic responsibilities. When conflicts arise between academic commitments and complementary programs (including athletic, cultural, educational, and volunteer activities), students, faculty, staff, and administrators all share the responsibility of minimizing and resolving them.

As a student you have the responsibility to inform the faculty member of potential conflicts as soon as you are aware of them, and to discuss and work with the faculty member to identify alternative ways to fulfill your academic commitments without sacrificing the academic integrity and rigor of the course.

- **Recording Classroom Activities** – No student may record or tape or photograph any classroom activity without the express written consent of the course instructor.

The Learning Center: Academic Support and Disabilities

The Learning Center, which is in APEX (Gault library) offers a variety of academic support services, programs and 1:1 meetings available to all students. Popular areas of support include time management techniques, class preparation tips and test taking strategies. In addition, the Learning Center coordinates peer-tutoring for several academic departments. Students are encouraged to schedule an appointment at the APEX front desk or visit the Learning Center Website for additional options.

An additional support that the Learning Center offers is English Language Learning. Students can receive instruction or support with English grammar, sentence structure, writing, reading comprehension, reading speed, vocabulary, listening comprehension, speaking fluency, pronunciation, and American culture through 1:1 meetings with the Learning Center staff, ELL Peer Tutoring, ELL Writing Studio courses, and other programming offered throughout the year. Students seeking ELL support are encouraged to visit the APEX front desk.

The Learning Center also coordinates accommodations for students with diagnosed disabilities. At the beginning of the semester, students should contact the Learning Center (ext. 2595) to make arrangements for securing appropriate accommodations. Although the Learning Center will notify professors of students with documented disabilities and the approved accommodations, students are encouraged to speak with professors during the first week of each semester. If a student does not request accommodations or does not provide documentation to the Learning Center, faculty are under no obligation to provide accommodations.

Title IX Reporting Policy

The College of Wooster is committed to fostering a campus community based on respect and nonviolence. In accordance with Title IX, Wooster is legally obligated to investigate incidents of sexual harassment and sexual assault that occur on our campus. Faculty who become aware of any incident of sexual violence, including harassment, rape, sexual assault, relationship violence, or stalking, are required by law to notify Wooster's Title IX Coordinator. For more information about your rights and reporting options at Wooster, including confidential and anonymous reporting options, please visit <http://www.wooster.edu/offices/title-ix/>.

The details of this syllabus are subject to change based on our progress through the material and the ever evolving COVID-19 situation.