CS 210: Principles of Computer Organization

Syllabus – Fall 2017

Instructor: Nathan Sommer Email: nsommer@wooster.edu Phone: 330-263-2393 Office Location: Taylor 313 Office Hours: TBD, they will be posted on the course web site.

Meeting Time: MWF, 11:00 AM to 11:50 AM in Taylor 302

Course Web Site: csweb.wooster.edu/nsommer/cs210 Class Slack Team: cs210f17

Course Description

This course is an overview of the design and architecture of computing systems, and an introduction to machine language. Topics include: digital logic, computer arithmetic, memory systems, addressing techniques, microprogramming, assembly language programming, and parallelism.

Course Goals

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

- Understand how programs are translated from high-level languages into machine language, and how such programs are executed.
- Describe the basic hardware design principles used in computer systems.
- Identify factors that influence the performance of a computer program.

Course Prerequisites

CSCI 120

Required Text

The following text is required:

• Structured Computer Organization, Sixth Edition by Andrew S. Tanenbaum and Todd Austin.

Reading assignments will be assigned throughout the semester.

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.

- Overview of Computer Systems
- Number Representation and Arithmetic
- Digital Logic
- Microarchitecture
- Instruction Sets
- Operating Systems
- Assembly Language
- Parallel Computing

Assignments and Tests

Your grade will be calculated based on the following items:

• Attendance and Quizzes – At the beginning of each class session I will pose at least one question to the class using plickers. Each class session will be worth one point, plus one point for each question that has an answer that I expect you to know. This will serve as both an attendance taking mechanism and as a way to give small quizzes.

You will not be able to make up plicker points. If you provide a valid reason why you cannot make it to class I will exclude that day's plicker points from your grade. To have your plicker points excluded you must notify me *before* class.

If you lose your plicker card or forget to bring it to class, you will not earn any plicker points for that day. If your card is lost you can come to my office and I will print you out another one, but I will not bring replacement plicker cards to class for you.

• **Homework** – Homework will be assigned regularly throughout the semester. Homeworks will consist of small programming tasks, written exercises, and reading responses. Each homework will typically be due the class period after it is assigned.

Some class sessions will involve coding in class. Often you will not be able to complete the exercise in class, and finishing the program will be a homework assignment.

Many of the homework assignments will be distributed and collected via git-keeper. 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 homework assignments, and you will be given more time to complete them. Completion time and grading will vary from project to project.
- **Tests** There will be 2 tests in class during the semester. They are tentatively scheduled for September 20 and November 8. You may only re-schedule a test for college approved absences or a documented illness. In either case you must contact me *before* the beginning of the test.
- Final Exam There will be a cumulative final exam given in class on Monday, December 11 at 9:00 AM.

Grading

Grades will be weighted as follows:

- 10% $\,$ Attendance and Quizzes $\,$
- 30% Homework
- 30% Programming Projects
- 15% Tests (2 @ 7.5% each)
- 15% 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. Contacting me via email is fine for general questions, but if you have specific questions about code you must communicate with me over direct message in the class Slack team.

If you are struggling with the material, it is generally more effective to talk in person. You are most likely to find me in my office during office hours, but I will be around other times as well. Dont be shy about stopping by or emailing me to set up an appointment.

Course Policies

- Assignment Submission Many homework assignments and programming 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 (or the class grader) 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 past 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 occasionally there may be exceptional circumstances. If you miss a class or know that you will miss an upcoming class, please contact me as soon as possible to explain the situation. You will still be expected to keep up with assignments and class content.
- Academic Honesty You are encouraged to discuss homework assignments and programming 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 invevitable. 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 persons 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 of the institution as described in *The Scots Key* and the *Handbook of Selected College Policies*. These policies are available here:

https://www.wooster.edu/academics/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 Nathan Sommer. If a student believes that he/she is disabled and needs to record or tape classroom activities, he/she should contact the Office of the Secretary to request an appropriate accommodation

The Learning Center: Academic Support and Disabilities

The Learning Center, which is located 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 call x2595.

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

The details of this syllabus are subject to change based on our progress through the material.