

Syllabus

CSE 220: Systems Programming

Jessica Grogan

Summer 2025

Lecture: 12pm-1pm Mon, Wed, and Fri in Cooke 127a

Lab: 1:30-3:30 Thursdays in Bell 340

Office hours: 10am-12pm on Mondays and Wednesdays in Davis 203 or you can email Jessica at jrgrogan@buffalo.edu for an appointment.

There are no student assistants / TAs. The only instructor is Jessica Grogan.

Course Description

CSE 220 is a 4 credit course. This course is an introductory course on computer systems. It introduces computer systems from a programmer's perspective, rather than a system implementer's perspective, which prepares students for more advanced topics that discuss the internals of a computer system (e.g., operating systems or computer architecture). As a result, the focus of the course is teaching programmable interfaces of a computer system as well as how to use them correctly and effectively when writing a program. The topics mainly include hardware/software interfaces (e.g., data representation in memory) and OS/application interfaces (e.g., syscalls). In discussing these topics, the course gives an overview of a complete computer system, the hardware, operating system, compiler, and network, in order to guide students through various components that modern programs rely on to accomplish their intended purposes.

Prerequisites

- CSE 116.
- Computer Science, Computer Engineering, Bioinformatics/CS, or Computational Linguistics major

Students are expected to have a firm understanding of the material from CSE 116 at the University at Buffalo and its prerequisites.

Lecture

Attendance This will be tracked through participation in lectures. You **must** attend **28** lectures. Recall there are 4 lectures we will not have due to the federal holidays or my absence. This means you can “skip” 3 more for whatever reason before your grade is impacted.

Quizzes These will be handed out during lectures and will be based upon required readings or some other relevant course material.

Submission Policy

Programming Assignments There will be no late days or grace period. When the next programming assignment is released, the previous assignment submission portal will be closed. Assignments will go out at noon on their respective Fridays.

Labs If a lab was released to be done over the weekend, it is due at the end of Monday office hours. Otherwise, the lab is due at the end of the lab section.

Exam Re-grading Policy If you believe that an exam has been graded incorrectly, you may submit it for re-grading. A request for a re-grade must be submitted within one calendar week of the exam being returned to you

Grading Policy The following makes up 100% of your grade:

20%: Final exam	15%: Lab Assignments	15%: Lecture quizzes
15%: Midterm	10%: Pa4	5%: Pa0
5%: Pa1	5%: Pa2	5%: Pa3
5%: Pa5		

Requirements:

- Your grade will be capped at a C if you do not pass 20 lecture quizzes.

- Your grade will be capped at a C if you do not obtain >70% average between your midterm and final.
- You will receive an F if your exam average is <40%
- You will receive an F if you do not get 100% on the academic integrity quiz.

Grading scale

Final grades will be assigned from the above percentages as follows, although individual component scores may be adjusted or a curve of the instructor's choice may be applied if the instructor deems it warranted. Lower percentages are inclusive, that is, a 90.0% would be an A-.

A 95-100 %	A- 90-95%	B+ 87-90 %	B 83-87 %
B- 80-83%	C+ 77-80 %	C 73-77 %	C- 70-73 %
D+ 67-70%	D 63-67 %	F 0-63 %	

Program Outcomes and Competencies

This course is designed to fulfill a specific role in your education here at the University at Buffalo, as part of a larger curriculum to provide you with the foundations to propel you into a successful career as a computer scientist or engineer. As a 200-level course, CSE 220 provides less structure and requires more personal responsibility than 100-level courses, but in turn provides more structure and guidance than 300- and 400-level courses. You will learn not only technical details and skills, but also apply personal time management and study skills in ways that may be new to you.

Learning Objectives Students who pass CSE 220 with an A or B will have demonstrated, through examination or practical implementation, substantial mastery of the topics listed here. Students who pass CSE 220 with a passing but lesser grade will have demonstrated competence appropriate for moving on to future courses at UB in the topics listed here.

Numeric Representations: Students will translate decimal integers to and from their binary representation.

Memory Organization: Students demonstrate an ability to manipulate user-space memory in a Unix process via address calculation and direct manipulation by

pointer casting. They will show the ability to identify the relevant sections of a statically-linked Unix process (text, data, BSS, stack, and heap).

Computer Architecture: Students identify the various logical elements of a modern computer, including CPU, cache, main memory, secondary storage, and data and address busses. They demonstrate an understanding of the various levels of memory in the storage hierarchy, including CPU registers, various levels of cache, main memory, and secondary local or remote storage. They will demonstrate the ability to calculate memory alignments and identify certain caching effects.

Operating Systems: Students will explain the basic duties of an operating system, including: the process abstraction, isolation of user-space processes, management and sharing of hardware resources, memory protection and virtual memory management, and the system call interface.

Concurrency: Students will implement simple multi-threaded data structures. They will demonstrate the ability to use mutual exclusion to protect critical sections and enable the safe sharing of memory between threads in an application

Academic Integrity

Students will abide by the CSE Academic Integrity Policy, the University Academic Integrity Policy, and the Undergraduate or Graduate amendments thereof, as appropriate.

The Academic Integrity policy for this course can be found on Prof. Blanton's web site, under Policies. You should read it for additional information and clarifications not found here.

https://cse.buffalo.edu/~eblanton/policy/academic_integrity/

<https://www.buffalo.edu/academic-integrity/policies.html>

<https://engineering.buffalo.edu/computer-science-engineering/information-for-students/undergraduate-program/cse-undergraduate-academic-policies/cse-academic-integrity-policy.html>