SYLLABUS

CPEN 212 (2021 W2)

COURSE INFORMATION

Title: Computer Systems II.

Description: How programs work: abstractions from the CPU ISA all the way to OS and compilers.

CONTACTS

Mieszko Lis ⟨mieszko@ece.ubc.ca⟩, KAIS 4050.

COURSE STRUCTURE

Lectures: Tuesdays and Thursdays 14:00–15:30, on Zoom (see Canvas for link).

Website: See Canvas for course marks; most material distributed on Piazza.

Labs: Students will complete ~6 coding assignments covering the computing abstractions covered in the course.

TOPICS

The course starts from a simple model of a CPU and covers the stack of abstractions that allows programs to run on modern hardware. We will learn about how ISA are constructed, how to implement control flow abstractions like procedures, dynamic dispatch, and closures; memory management from malloc to garbage collection to virtual memory; program execution including static and dynamic linking and loading; security considerations; how compilers work, including typesystems, code generation, and basic optimization; how hardware architecture determines what you should (and should not) optimize, parallelism paradigms, and more. Buckle up.

MATERIALS

Book (optional): Bryant & O'Hallaron. *Computer Systems: A Programmer's Perspective, 3rd ed.*

Other: Occasional readings and references will be posted on Piazza pro re nata.

COURSE ASSESSMENT

Marks: The final grade will be calculated as follows:

Labs	40%
Midterm	20%
Final Exam	40%

Marks will be posted on Canvas when available.

Late policy: Late submissions will be accepted at 25% penalty per day (25% within 24h after the deadline, 50% within the next 24h, and so on). Because we will normally clone the submission repositories on GitHub at the date of the submission deadline, you will need to PM the instructors on Piazza **before** the deadline to take advantage of the late policy.

Academic concessions: Students requiring accommodations that fall under the UBC Academic Concession policy must submit a *Request for Academic Concession Form* via Engineering Academic Services.

ACADEMIC INTEGRITY

The work each student submits must be their own—this includes code, text, figures, data, etc.—and the data must be reproducible. Assignments are individual.

Violations will be directly reported to the Dean of Applied Sciences. Should you have doubts about what might violate this policy, please clarify with a course instructor.

UNIVERSITY POLICIES

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious and cultural observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available at https://senate.ubc.ca/policies-resources-support-student-success.