

CSE 486(586) LEC Distributed Systems Course Description (Fall 2022)

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1 OVERVIEW

Distributed systems, i.e., many machines work together to provide services, are a fundamental building block of today's applications (e.g., Google, Amazon, Meta), which must handle a tremendous amount of user data and requests. Distributed systems are also the key enabler of future applications as service scale and data keep growing. This course covers the design and implementation of distributed systems.

Design-wise, the course covers the challenges and solutions behind distributed systems, including network abstraction, notion of time, consistency guarantees, fault tolerance, distributed transactions, and case studies of some state-of-the-art modern systems. Implementation-wise, the course includes programming assignments that develop the skills of designing, implementing, and debugging practical distributed systems.

Learning outcomes. Students will gain a concrete understanding of the principles and techniques behind the design of modern distributed systems and the experience of implementing complex distributed protocols.

Prerequisites. CSE 305/505 or equivalent. Programming maturity is recommended.

2 COURSE INFORMATION

- **Lectures:** 2:00 PM – 3:20 PM, Tuesday and Thursday, Knox 109. In person only
- **Instructors:**
 - Professor: Haonan Lu (haonanlu@buffalo.edu, 338M Davis Hall)
 - TAs: Elvis David Rodrigues (elvisdav@buffalo.edu), Adithya Raman (araman5@buffalo.edu), and Ramesh Pavan Pothamsetty (rpothams@buffalo.edu)
- **Websites:**
 - UB Learns for course materials, e.g., slides, schedule, suggested papers
 - Piazza for discussions and announcements. Join link: <https://piazza.com/buffalo/fall2022/cse486586>
 - Github for programming assignments. Join link to get your copy of assignments: <https://classroom.github.com/a/xDwEA7z->
 - Autolab (<https://autograder.cse.buffalo.edu/>) for assignment submission
 - You may bookmark/add this course calendar to track course events: <http://shorturl.at/ewHPX>
- **Office hours (in-person only, changes will be announced on Piazza in advance):**
 - Professor: 3:30 PM–5:00 PM, Monday and Thursday, 338M Davis Hall
 - TA office hours, location: lounge space next to 302 Davis Hall
 - * Elvis: 10 AM–12 PM Tuesday and 10 AM–12 PM Thursday
 - * Adithya: 2 PM–4 PM Wednesday and 2 PM–4 PM Friday
 - * Ramesh: 8 AM–10 AM Monday and 8 AM–10 AM Wednesday
- **Exam time and date:**
 - Midterm: 2:00 PM–3:20 PM, Thursday, October 6, 2022, Knox 109
 - Final: 3:30 PM–6:30 PM, Tuesday, December 13, 2022, Knox 109

3 COURSE MATERIAL

There will be no required textbook. All topics will be covered in slides. There will be some suggested scientific paper reading, but papers will not be included in the exams. Slides will be posted on UB Learns.

4 GRADING POLICY

- **Grade components:** midterm (30%), final (30%), and programming assignments (40%)
- Letter grades are the combined overall percentage of all grade components. A(95–), A-(90–94), B+(85–89), B(80–84), B-(75–79), C+(70–74), C(65–69), C-(60–64), D+(55–59), D(50–54), F(less than 50). This policy is subject to change.
- Grades could be appropriately curved if needed
- There will be no pop quizzes or take-home quizzes
- Extra credits are available in programming assignments (subject to change)

5 EXAMS AND ASSIGNMENTS

- Both exams are closed-book. Exam questions are from slides and programming assignments. Suggested papers are not included in the exams.
- Do not miss exams. No make-up exams will be provided unless due to emergency circumstances with official approval documents, e.g., a legitimate letter from a legitimate doctor.
- There are four programming assignments, and they are all individual projects. Their grade breakdown is as follows (subject to change)
 - Assignment 1: 10%
 - Assignment 2: 10%
 - Assignment 3: 20%
 - Assignment 4: 10% *extra credits*
- Tentative deadlines for programming assignments are in the schedule table on UB Learns.

6 OFFICE HOUR POLICY

TA office hours are mainly used to answer questions related to programming assignments. Students should not expect TAs to do line-by-line code debugging. Instead, TAs' job is to clarify design details, point out incorrect designs, point out places in the code that are possibly broken, and give suggestions on how to fix the code.

Professor's office hours mainly focus on questions related to course topics, e.g., concepts and knowledge in slides or system-related questions in general.

7 ACADEMIC INTEGRITY

UB's definition of Academic Integrity in part is "Students are responsible for the honest completion and representation of their work." It is required as part of this course that you read and understand the departmental academic integrity policy at: <https://engineering.buffalo.edu/computer-science-engineering/information-for-students/undergraduate-program/cse-undergraduate-academic-policies/cse-academic-integrity-policy.html>, UB academic integrity policy at: <https://catalog.buffalo.edu/policies/integrity.html>, and graduate academic integrity policy at: <https://www.buffalo.edu/grad/succeed/current-students/policy-library.html#academic-integrity>. You are allowed to converse about general concepts, but in no way are you allowed to share code or have one person do the work for others. In particular, programming assignments in this course are individual projects. You should not copy code/solutions from the Internet or other people. You should not write/share any part of the code for/with other people. You should not make your code repository public or visible to other students. You must abide by the UB and Departmental Academic Integrity policy at all times. If you are unsure if a particular action violates the academic integrity policy, assume that it does until you receive clarification from the instructor.¹

¹Partially adapted from Professor Bina Ramamurthy's syllabus.

8 STUDENTS WITH ACCESSIBILITY NEEDS

Students with disabilities please register with the Office of Student Accessibility, and then let the instructor know, so special arrangements can be made. Please find more helpful resources at <https://www.buffalo.edu/access.html>.