CS485 Networked Operating System Programming

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1 Course Goals

This course covers the principles, advanced concepts, and technologies of distributed systems, including communication, replication, fault tolerance, and security. Approximately two-thirds of the course will be devoted to basic concepts and techniques, and the remaining third will focus on assorted current topics in modern distributed systems. Both senior undergraduate and graduate students are welcome to the class. By the end of this course, students will learn:

- Fundamentals of designing and implementing distributed systems in real-world settings, gaining a solid understanding of distributed algorithms, system architectures, and the trade-offs involved in building distributed systems.
- Development of advanced distributed systems through a combination of case studies and hands-on programming exercises. Through practical programming assignments, students will apply theoretical concepts to build and optimize distributed systems, enhancing their technical proficiency and problem-solving abilities.
- Development of strong technical writing and presentation skills. Through practical class project, students will learn to write technical reports, document project findings, and deliver engaging presentations using effective presentation techniques.

2 Course Materials

- Maarten van Steen and Andrew S. Tanenbaum, Distributed Systems, 4th Edition, 2023, ISBN-10 9081540637. (highly recommended)
- George Coulouris, Jean Dollimore, Tim Kindberg, and Gordon Blair, Distributed Systems: Concepts and Design, Addison-Wesley, Fifth Edition, 2011, ISBN: 0132143011. (recommended)

3 Course Outline (Tentative)

Week	Topic
week 1	Introduction to distributed systems
week 2	Remote Procedure Call
week 3	Remote Method Invocation
week 4	Stream-Oriented Communication
week 5	Scheduling
week 6	Naming
week 7	Clock Synchronization
week 8	Consistency
week 9	Fault Tolerance
week 10	Security
week 11	File Systems
week 12	Current trends
week 13	Exam
week 14	Research projects
week 15	Research projects

4 Course Work

50% homeworks, 28% exams, and 22% class project

5 Prerequisite

Students are expected to have taken and received an "C" or better in CS 361 or equivalents, or permission of instructor.