Preamble

ECE 751: Distributed Computing

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What is ECE 751?

- ECE 751 is a fast-paced introduction to distributed computing.
- The course assumes substantial software experience and solid engineering chops.
- The course covers both theory and practice.
- There are several coding assignments.

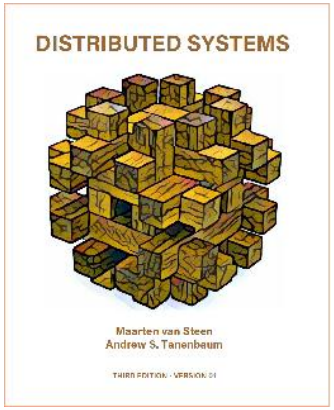
I assume you know …

From ECE 252 or similar course: Processes and threads (pthreads); system calls; concurrency (semaphore, mutex, monitors, and barrier synchronization); user-level memory management. Performance and correctness of concurrent systems. Deadlock detection and recovery; file systems.

From ECE 358 or similar course: Some networking basics.

From other undergraduate courses: object-oriented programming, testing and debugging strategies, pointers and references, memory management.

Learning materials



- **Required textbook:** Maarten van Steen and Andrew S. Tanenbaum, Distributed Systems, 3rd Ed., Pearson, 2017.

  This textbook is available online at https://www.distributed-systems.net/. Hardcopies can be purchased on Amazon.

- **Courseware:** LEARN (https://learn.uwaterloo.ca) will be used to distribute lecture notes and assignments. In addition, an online discussion forum will be organized using Piazza (https://piazza.com/uwaterloo.ca/fall2021/ece751/home).

Evaluation

Default structure:

5 Java assignments

Assignments:	70%	(2 small, 3 large)
Quizzes or exam:	30%	

Alternative structure:

Please talk to the instructor if you are interested in doing a major project.

Open-source software covered

- Memcached (client-server paradigm) Demo
- Apache Thrift (remote procedure calls) A1 + A3
- Apache Hadoop/Spark (big data processing) A2 48%
- Apache ZooKeeper (distributed coordination) A3
- Apache Kafka (data stream processing) A4

ECE Linux computing facility

All assignments will be completed using the Linux environment. The ECE department provides several Linux servers for this purpose:

- eceterm1, eceterm2, eceterm3 are used only for accessing the other machines from outside the campus firewall
- eceubuntu1, eceubuntu4
- ecetesla0, ecetesla1, ecetesla2, ecetesla3, ecetesla4

Note 1: See https://ece.uwaterloo.ca/Nexus/arbeau/clients/ for load statistics.

Note 2: Use TCP port numbers in the range 10,000-11,000 for assignments.

Note 3: To speed up access to ecelinux hosts, please use SSH public key authentication + set up an SSH agent + enable agent forwarding.

Tips for success

- **Keep up** with lectures.
- **Ask and answer** questions.
- **Cultivate an atmosphere of mutual respect** in the virtual classroom.
- **Provide your feedback on the course** by e-mail, or using an anonymous post in Piazza.

Contact information

Instructor:

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Office hours: online by appointment
(please bring questions to lecture)

Note: Please include "ECE 751" in the subject line of any email you send to the teaching team.