

CS 754: Advanced Distributed Systems Outline

Course Number: CS 754

Course Name: Advanced Distributed Systems

Instructor: Samer Al-Kiswany (DC 3516)

Instructor office hours: I will be available after every class to answer questions or by appointment.

Course Description:

This course will discuss a broad range of topics about modern distributed systems. The course will discuss the state of the art of these systems and how and why they reached there. We will discuss how modern systems can tolerate failures, maintain data consistency, scale, leverage the new hardware capabilities, and exploit highly concurrent hardware.

Course Objectives:

This course aims to strengthen students' theoretical background in distributed system as well as building their technical and research skills.

Course Topics:

- Distributed middleware
- Fault tolerance
- Consistency
- Storage systems
- Data processing engines
- Scalability
- Scheduling
- Security
- Case studies of production systems

Grading:

The final course mark is computed as follows:

- Assignments 40%
- Projects 60%

Late Submission Policy

33% of the points will be deducted for each late day (or a fraction of a day).

Group Policy

Some of the projects may require that the students work in groups. Each project will specify if it is to be done individually or in a group. It is the student's responsibility to find partners and form a group. If a student is unable to form a group, he/she should talk to the instructor to get a permission to do the project individually. Doing a project individually without getting the instructor's permission results in 33% points deduction. The deadline for getting the instructor's permission is in one week from the date the project is posted.

Mark Appeal Process:

Students have one week after receiving an mark to appeal it. To appeal a mark the student should meet the instructor during one of the office hours.

Intellectual Property:

Students should be aware that this course contains the intellectual property of their instructor, TA, and/or the University of Waterloo. Intellectual property includes items such as:

- Lecture content, spoken and written (and any audio/video recording thereof);
- Lecture handouts, presentations, and other materials prepared for the course (e.g., PowerPoint slides);
- Questions or solution sets from various types of assessments (e.g., assignments, quizzes, tests, final exams); and
- Work protected by copyright (e.g., any work authored by the instructor or TA or used by the instructor or TA with permission of the copyright owner).

Course materials and the intellectual property contained therein, are used to enhance a student's educational experience. However, sharing this intellectual property without the intellectual property owner's permission is a violation of intellectual property rights. For this reason, it is necessary to ask the instructor, TA and/or the University of Waterloo for permission before uploading and sharing the intellectual property of others online (e.g., to an online repository).

Permission from an instructor, TA or the University is also necessary before sharing the intellectual property of others from completed courses with students taking the same/similar courses in subsequent terms/years. In many cases, instructors might be happy to allow distribution of certain materials. However, doing so without expressed permission is considered a violation of intellectual property rights.

Academic Integrity:

In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [Check <http://uwaterloo.ca/academic-integrity> for more information.]

Grievance:

A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4, <https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-70>. When in doubt, please be certain to contact the department's administrative assistant who will provide further assistance.

Discipline:

A student is expected to know what constitutes academic integrity [check <https://uwaterloo.ca/academic-integrity/integrity-waterloostudents/what-misconduct>] to avoid committing an academic offence, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about "rules" for group work/collaboration, should seek guidance from the course instructor, TA, academic advisor, or the Undergraduate Associate Dean. For information on categories of offences and types of penalties, students should refer to

Policy 71, Student Last Modified: Oct. 2013 Discipline, www.uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-71. For typical penalties, check Guidelines for the Assessment of Penalties, <http://www.uwaterloo.ca/secretariat/policies-procedures-guidelines/guidelines/guidelines-assessment-penalties>.

Appeals:

A decision made or penalty imposed under Policy 70 (Student Petitions and Grievances) (other than a petition) or Policy 71 (Student Discipline) may be appealed if there are grounds. A student who believes he/she has grounds for an appeal should refer to Policy 72 (Student Appeals).

Note for Students with Disabilities:

AccessAbility Services (formerly the Office for Persons with Disabilities), located in Needles Hall, Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities, without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with AccessAbility Services at the beginning of each academic term.

Mental Health

If you or anyone you know experiences any academic stress, difficult life events, or feelings like anxiety or depression, we strongly encourage you to seek support.

On-campus Resources

- Campus Wellness <https://uwaterloo.ca/campus-wellness/>
- Counselling Services: counselling.services@uwaterloo.ca / 519-888-4567 ext 32655 / Needles Hall North 2nd floor, (NH 2401)
- MATES: one-to-one peer support program offered by Federation of Students (FEDS) and Counselling Services: mates@uwaterloo.ca
- Health Services service: located across the creek from Student Life Centre, 519-888-4096.

Off-campus Resources

- Good2Talk (24/7): Free confidential help line for post-secondary students. Phone: 1-866-925-5454
- Here 24/7: Mental Health and Crisis Service Team. Phone: 1-844-437-3247
- OK2BME: set of support services for lesbian, gay, bisexual, transgender or questioning teens in Waterloo. Phone: 519-884-0000 extension 213

Diversity

It is our intent that students from all diverse backgrounds and perspectives be well served by this course, and that students' learning needs be addressed both in and out of class. We recognize the immense value of the diversity in identities, perspectives, and contributions that students bring, and the benefit it has on our educational environment. Your suggestions are encouraged and appreciated. Please let us know ways to improve the effectiveness of the course for you personally or for other students or student groups. In particular:

We will gladly honor your request to address you by an alternate/preferred name or gender pronoun. Please advise us of this preference early in the semester so we may make appropriate changes to our records.

We will honor your religious holidays and celebrations. Please inform of us these at the start of the course.

We will follow AccessAbility Services guidelines and protocols on how to best support students with different learning needs.