Department of Electrical and Computer Engineering

ECE 610: Broadband Communication Networks Course Outline

Winter 2022

Scheduling and Contact

Instructors: Dr. Albert Wasef: ██████, ext. 31723, awasef@uwaterloo.ca
Office hours: I'm available for questions and discussion after most lectures, but I'm also happy to meet with you at any other time (set up an appointment by seeing me after class or by sending an email).

Lectures Schedule and Location: ████████████████████   █████████
Alternative lecture delivery methods could be used if there is a need.

Prerequisite: Undergraduate probability

High level description: This is an introductory graduate course on the fundamental design and implementation concepts of computer communication networks, applications protocols, network layer protocols (including routing and addressing), data link protocols, and local area networks (wired and wireless). Examples will be drawn primarily from the Internet.

Outline:

1. Introduction: Internet as a network of networks, standardization, digital transmission principles and technologies, switching and multiplexing technologies, design of network: the layered approach, its advantages and shortcomings, protocols, services, issues in quality of service.
2. Application layer: HTTP, DNS, etc.
3. Transport layer: from congestion control principle to current protocols (TCP and UDP), reliable data transfer.
4. Internetworking: introduction, naming, addressing, IP: fragmentation, error handling.
5. Routing: fundamentals, Intra-domain routing (RIP, OSPF), Inter-domain routing (BGP)
6. Data link layer from an introduction to error detection to framing, Multiple Access protocols: Aloha, CSMA/CD and CSMA/CA. Example of LAN technologies: Ethernet, WiFi, and Switches.

Course website: Any course announcements or material prepared for the lectures and problem sets will be posted on LEARN.

Resources:
Textbook: Computer Networking, 8/e (7/e or 6/e are also acceptable), James F. Kurose, Keith W. Ross. Other resources will be announced in class.

Course Evaluation:
- The marking scheme will be:
   - o   Midterm exam
   - o   Final exam
   - o   Any other deliverables requested by the course instructor.

Course Evaluation Rules:

- If you miss the midterm without a valid reason, that midterm earns a score of zero.
- If you miss the midterm for a valid reason, your final exam weight will be increased accordingly. There will be no "make up" midterm exams.
- The instructor determines whether or not a reason for missing a lab deadline or exam is deemed to be valid.
- The instructor reserves the right to change the grading scheme (and to curve the final grade) as long as no student would do worse with the new grading scheme.
- Due to COVID-19, dates, times and durations are subject to change. Also, alternate grading schemes, exam arrangements, or course deliverables may be necessary. These will be communicated when available.
- The instructor also reserves the right to use alternative grading schemes in special circumstances. For example, if an accommodation is necessary, an alternative grading scheme may be used for individual students

Problem Sets:

- Problem sets will be posted on LEARN. The onus is on you to attempt them.
- Partial/full solutions for these problem sets will be posted on the course website.

Relevant University Policies

The following statements are a required part of every course outline.

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. For more information, check
https://uwaterloo.ca/engineering/current-undergraduate-students/academic-support/academic-integrity

Grievances: 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, contact your academic advisor.

Discipline: A student is expected to know what constitutes academic integrity to avoid committing academic offenses and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course professor, academic advisor, or the undergraduate associate dean. For information on categories of offenses and types of penalties, students should refer to Policy 71, Student Discipline,
https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-71
For typical penalties check Guidelines for the Assessment of Penalties,
https://uwaterloo.ca/secretariat/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 is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72, Student Appeals,
https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-72

Disabilities: The Office for Persons with Disabilities (OPD), located in Needles Hall, Room 1401, 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 the AccessAbility Services at the beginning of each academic term.