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## CS3357A - Computer Networks I Outline

The University of Western Ontario  
London, Canada

# Department of Computer Science

## CS3357A - Computer Networks I

### Course Outline - Fall 2021

## Course Description

This course provides an introduction to concepts and issues involved in computer networks and data communications. Topics include the Internet, protocol layers and their service models (with a focus on the TCP/IP model), network programming, principles of reliable data transfer, congestion control, routing, error detection and correction techniques, analog and digital data signaling and transmission, and a variety of other topics in network security, multimedia networking, mobile and wireless data communications, and network management, as time permits.

### Lecture Hours

12:30 - 1:30pm, Tuesdays, SEB-1200

12:30 - 2:30pm, Thursdays, WSC-55

Please note that this class is being delivered in-person. In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

**Prerequisites:** Computer Science 2210A/B and Computer Science 2211A/B.

**Antirequisites:** ECE 4436A/B.

**Note:** Unless you have either the prerequisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

## Instructor Information

**Instructor:** Michael Katchabaw  
**Office:** Consulting via [Zoom](#)  
**Office Hours:** 2:00pm - 3:30pm, Tuesdays  
**E-Mail:** [katchab@csd.uwo.ca](mailto:katchab@csd.uwo.ca)  
**Phone:** Western extension 84059

## Course Texts

The following text is required for this course:

- [Computer Networking: A Top Down Approach](#), 8th Edition by Kurose and Ross, published by Pearson Education, 2021.

Please note that as this new edition of the book is only available in a digital format. You can still obtain the 7th Edition in print, however, and that is still quite similar to the 8th Edition. To obtain a digital version of the 8th Edition of the text, please go to Book Store at Western or see VitalSource here:

<https://www.vitalsource.com/educators/products/computer-networking-james-kurose-keith-ross-v9780135928523>.

Additional references and suggested readings may be provided throughout the course as the assignments require them. Please check back to the course website for updates and more information.

## Course Topics

The course will address as many of the following topics as time will allow:

- *Networking fundamentals.* A history of computer networking and the Internet; the structure of the Internet; connectionless and connection-oriented services; circuit switching and packet switching fundamentals; protocols; layered protocol architectures and service models.
- *A tour of protocol layers.* The OSI and TCP/IP layered architectures; the application layer and sample application services; transport layer services, including discussions of the principles of reliable data transfer and congestion control; network layer services, including routing and multicasting; data link

layer services, including error detection and correction techniques and a variety of protocols (Ethernet, wireless 802.11X, etc.); physical layer services, including signalling, analog and digital data transmission, and channel capacity.

- *Network programming.* Socket programming; TCP and UDP programming interfaces; asynchronous communications; advanced socket options and programming techniques.
- *Advanced topics.* Multimedia networking; network security; wireless and mobile computing; network management.

## Lecture Notes

Course lecture notes will be made available in PowerPoint and PDF formats on the course website on a weekly basis, as they are developed. They are provided as a courtesy by the course instructor. Possessing (and even reading) these notes is not a suitable substitute for the lectures.

## Course Website

The CS3357A website is accessible through OWL at <http://owl.uwo.ca>. Class and assignment information will be posted on this website on a fairly regular basis. You are responsible for reading this information frequently.

## Computing Facilities

Each student will have access to computing facilities administered by the Department of Computer Science and/or Western University. In accepting their accounts, students agree to abide by the Department's [Rules of Ethical Conduct](#). During this course, we may also make use of cloud infrastructure provided either by Western or by Amazon; details on this will be discussed in class. Computing facilities will be accessible online, remotely. Physical, in person access to labs and collaborative spaces will of course depend on the ever-changing COVID-19 situation on campus; please see the Department [home page](#) for more information and updates.

**Note:** *After-hours access to Computer Science lab rooms is by student card. If a student card is lost, you will need to visit the Student Services Building to obtain a replacement. As of 2021, the cost for a replacement card is \$32. More information is available at [https://registrar.uwo.ca/services/western\\_onecard\\_and\\_photo\\_standards.html](https://registrar.uwo.ca/services/western_onecard_and_photo_standards.html). Students enrolled in Computer Science courses will be granted access to the labs within 7 days of enrolment. If you do not have access to the labs after 7 days, please open a ticket with Science Technology Services at <https://helpdesk.sci.uwo.ca>.*

## E-Mail Contact

We will occasionally need to send e-mail messages to the whole class, or to students individually. In accordance with policy ([https://www.uwo.ca/univsec/pdf/policies\\_procedures/section1/mapp113.pdf](https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf)), the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.

## Student Evaluation

Grades will be based on assignment work worth 65% and a final exam worth 35%. There will be four individual assignments worth 5%, 15%, 20%, and 25%.

To be eligible to receive a passing grade in the course, your mark on the final exam must be at least 40%, and your average on the assignments must be at least 40%. Otherwise, the maximum overall mark you can receive is 45%. To be eligible to receive a grade of C or higher, your mark on the final exam must be at least 50%, and your weighted average on the assignments must be at least 50%. Otherwise, the maximum overall mark you can receive is 58%.

## Assignment and Test Feedback

Every effort will be made to have assignments marked and handed back within 3 weeks of the handin date, preferably sooner. If we are unable to comply with our intended return dates, revised dates will be posted on the course website.

## Test and Exams

**Final:** 3 hours during the December exam period

As an important note, computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating. Furthermore, there will be no cheat sheets, books, or other reference materials allowed for the exam. No calculators, cell phones, or other electronic devices will be permitted either.

If you miss the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as soon as you are able to do so. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period).

## Assignments

## Due Dates (tentative)

Assignment #1: 5% (light)	Assigned September 14, 2021	Due September 28, 2021
Assignment #2: 15% (medium)	Assigned September 28, 2021	Due October 19, 2021
Assignment #3: 20% (heavy)	Assigned October 19, 2021	Due November 9, 2021
Assignment #4: 25% (heavy)	Assigned November 9, 2021	Due December 8, 2021

If, for any reason, the assignment schedule given above cannot be adhered to, the assignment marks will be pro-rated. (The assignments are worth 65% of the overall mark for the course. If an assignment has to be cancelled for any reason, the remaining assignment weights will be prorated to add up to 65%.)

## About the Assignments

- Assignment descriptions will be posted on the course website by the dates listed above.
- Any changes, updates, and clarifications to these descriptions will also be posted on the website. It is your responsibility to monitor these pages closely.
- Assignments will involve exploring and analyzing network protocols and network programming (in Python).

## Submission

- All assignments must be typed for legibility and to facilitate electronic submission.
- You are required to submit each assignment electronically through OWL. Details will be given in the descriptions. We reserve the right to use similarity detection software to detect possible plagiarism cases.
- Assignments are expected to be individual efforts. Any code that is borrowed from an existing source or book must be explicitly allowed in the assignment description or approved in advance by the course instructor; otherwise, this may constitute a plagiarism offence.

## Late Policy

- Late assignments will be accepted for up to two days after the due date, with weekends counting as a single day; the late penalty is 20% of the available marks per day. Lateness is based on the time the assignment is submitted.
- Extensions will be granted only by your course instructor. If you have serious medical or compassionate grounds for an extension, you **must** take supporting documentation to the Academic Counselling unit of your faculty, who will contact the instructor.

## Marking

- Assignments are marked by the instructor and/or a teaching assistant assigned to the course. We will attempt to include some information about the marking criteria in the appropriate descriptions.
- When marking has been completed, you will be informed via the course website and/or e-mail.
- A request for adjustment in a mark must be made within 2 weeks of the date grades were first available. (Beyond that date, regrading will not be considered.) Such a request must be submitted in writing, and must include specific reasons why you believe you deserve more marks. The request must be accompanied by all materials that were originally handed in, as well as the original marker's grade summary sheet. Regrading requests will take a minimum of 24 to 48 hours to process; you will be informed when it is complete.
- Assignment marks may be posted periodically throughout the term through OWL. It is your responsibility to check that your marks have been recorded correctly.

## Backups

It is your responsibility to keep up-to-date backups of all assignment files in case of system crashes or inadvertently erased files. Retain copies of all material handed in, as well as the actual graded version, to guard against the possibility of lost assignments or errors in recording marks. It is not safe to discard these materials until you are satisfied that your final mark for the course has been computed properly.

## Tutoring

The role of tutoring is to help students understand course material. Tutors should not write assignments, projects, or take-home tests for the students who hire them. Having employed the same tutor as another student is not a legitimate defense against an accusation of collusion, should two students hand in work judged similar beyond the possibility of coincidence.

## Academic Consideration for Student Absence

Students who experience an extenuating circumstance (illness, injury or other extenuating circumstance) sufficiently significant to temporarily render them unable to meet academic requirements may submit a request for academic consideration through the following routes:

- Submitting a Self-Reported Absence (SRA) form provided that the conditions for submission are met.  
To be eligible for a Self-Reported Absence:
  - an absence must be no more than 48 hours
  - the assessments must be worth no more than 30% of the student's final grade
  - no more than two SRAs may be submitted during the Fall/Winter term
- For medical absences, submitting a Student Medical Certificate (SMC) signed by a licensed medical or mental health practitioner to the Academic Counselling office of their Faculty of Registration.
- Submitting appropriate documentation for non-medical absences to the Academic Counselling office in their Faculty of Registration.

Note that in all cases, students are required to contact their instructors within 24 hours of the end of the period covered, unless otherwise instructed in the course outline.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a student's Home Faculty.**

For the policy on Academic Consideration for Student Absences - Undergraduate Students in First Entry Programs,

see: [https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/accommodation\\_illness.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_illness.pdf) and for the Student Medical Certificate (SMC),

see: [http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/medicalform.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf).

## Accommodation Policy

Students with disabilities work with Accessible Education (formerly SSD) which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The Academic Accommodation for Students with Disabilities policy can be found at:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/Academic\\_Accommodation\\_disabilities.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf).

## Religious Accommodation

When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at: <https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>.

## Ethical Conduct

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

[http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/scholastic\\_discipline\\_undergrad.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf).

**Plagiarism:** Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence. Please note, however, that students are not allowed to make use of the work of others unless explicitly instructed to do so in the description of an assignment.

All projects are to be exclusively your own work. While project work requires you to work in teams, each

team is expected to act individually. You may discuss approaches to problems among yourselves; however, the actual details of the work (coding, documentation, etc.) must be an individual effort. Incidents that are judged to be the result of academic dishonesty will be reported to the [Undergraduate Chair](#). The selection of penalty to be applied is up to the Chair, with consultation of the instructor.

The standard departmental penalty for assignments that are judged to be the result of academic dishonesty is, for the student's first offence, a mark of zero for the assignment, with the offence reported to the Dean of your home faculty. You are responsible for reading and respecting the Department of Computer Science's policy on [Scholastic Offenses](#), and [Rules of Ethical Conduct](#).

The University of Western Ontario uses software for plagiarism checking. Students may be required to submit their written work and programs in electronic form for plagiarism checking.

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com/>).

## Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on add/drop courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling>

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education ([http://academicsupport.uwo.ca/accessible\\_education/index.html](http://academicsupport.uwo.ca/accessible_education/index.html)) at (519) 661-2147 if you have any questions regarding accommodations.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital>.

Learning-skills counsellors at the Student Development Centre (<http://www.sdc.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Students who are in emotional/mental distress should refer to Mental Health@Western ([http://www.health.uwo.ca/mental\\_health](http://www.health.uwo.ca/mental_health)) for a complete list of options about how to obtain help.

Additional student-run support services are offered by the USC, <http://westernusc.ca/your-services>.

The website for Registrarial Services is <http://www.registrar.uwo.ca>.