University of Lethbridge
Department of Mathematics and Computer Science

Computer Science 3780 – Data Communications and Networking
Course Outline – Fall 2025

LECTURES: Mon Wed 13:30 – 14:45 **Room B660**

INSTRUCTORS:

Lectures:
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Labs:
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TEXTS:

Main: *Computer Networking : Principles, Protocols, and Practice* 3rd Ed, by Bonaventure, available at https://beta.computer-networking.info/syllabus/default/index.html(under a CC License).

Supplementary reading: *An Introduction to Computer Networks* 2nd Ed, by Dordal, available at http://intronetworks.cs.luc.edu/.

Computer Networks: A Systems Approach, by Peterson and Davie, 2019, available at https://open.umn.edu/opentextbooks/textbooks/771 (CC-BY)

Computer Networks 5th Ed, by Tanenbaum and Wetherall.

GRADING SCHEME:	Tests (4)	60%
	Assignments (approx 4)	20%
	Project	10%
	Lab quizzes	10%

GRADE DISTRIBUTION: This information is provided as a guideline only and may be revised in this offering. Minimum percentages for each letter grade are:

A+	95	B+	81	C+	69	D+	56
A	90	B	77	C	65	D	50
A-	85	B-	73	C-	61	F	< 50

SCHEDULE:
(as time permits):

1) Network reference models
2) Fundamental mechanisms and algorithms at the data link layer (connecting two hosts): alternating bit, go back n, sliding window protocols.
3) Fundamental mechanisms and algorithms at the network layer (connecting networks together): data and control planes, routing (distance vector and link state routing).
4) Applications and transport layer: socket based network programming, connection establishment and release.
5) Naming schemes, medium access control, congestion control algorithms.
6) Network security.
7) Protocols, if time and hardware permits: ARP, UDP, TCP, IPv6 and IPv4, DNS, HTTP, SMTP.

COMMENTS:

– Labs will introduce network and multi-threaded programming, and synchronization mechanisms in C++. Labs are designed to assist students with the project. The project is about writing code for the transport layer - students will manage the correct transfer of a file subject to communication errors. Network / systems programming knowledge is tested in lab quizzes.
– Work must be submitted at the scheduled time; no provision is made for make-up midterm or late assignments, except for medical reasons or emergencies. Missed tests and assignments receive 0 points.
– Requests for remarking tests and assignments are accepted only in writing *no later than one week from the date your graded work was returned*. On the request: identify the assignment or midterm, briefly explain why you believe the mark is incorrect, date and sign. Note that if your work is remarked, your grade may go up, down, or remain unchanged.

AI USE POLICY

Generative AI can be a very effective tool for learning. Make sure you use AI appropriately because a significant fraction of your grade is obtained from answers you give personally, in class, on paper. Some concrete measures that define an appropriate use of AI tools are listed below.

- Never submit generated code that you do not fully understand.
- Use AI to generate repetitive, "boiler plate" code. Examples: code to insert random data into a network data structure that you are testing, or to generate a buffer that contains valid or invalid data from a network packet, etc.
- Use AI to generate code for a procedure you want to understand, in **small increments**. For example, try to have no more than 5-10 lines of newly generated code per query.
- Make sure the code generated is explained. Generated explanations are not always enlightening. Change the code, test, and run, to make sure you know what is going on.
- Keep generated code and code you plan to submit in separate files. Copy from the generated code into your work, adapt, and test. Compile and run your work often.

STUDENT CODE OF CONDUCT

- Plagiarism can lead to severe penalties. Consult the student code of conduct policy, `https://uleth.sharepoint.com/:b:/s/Policy/EYaNcsOfn-NHsfg3NNEIlFUBh7wkC1BPw52MabAXw84JFQ?e=OEeZb2`.