THE UNIVERSITY OF BRITISH COLUMBIA

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Department of Computer Science, Mathematics, Physics and Statistics
Okanagan Campus

COSC 328 001
Introduction to Networks
2021 Winter Term 1

Instructor: Dr. Mohamed Abdelpakey **E-mail:** mohamed.abdelpakey@ubc.ca

Classroom Schedule: Tue/Fri 11-12:30 pm

Location: Online

https://ubc.zoom.us/j/67501330409?pwd=U3BCaVBVNmNlRG9pVHA2SUV1VFRRUT09

Office Hours: Wednesday 11:30-1:00 pm or by appointment (virtual)

Course Website: Canvas

Text Book: Required Textbook: James F. Kurose and Keith W. Ross, Computer Networking:

A Top-Down Approach, Pearson, 7th edition, ISBN 0-13-359-22735-2

Labs:

L01:	Wed	10-12:00	PM	**TA:** Pinku Nath	**Email:** prantor@mail.ubc.ca
L02:	Tue	8-10:00	AM	**TA:** Zenab Kagdiwal	**Email:** zenabk@student.ubc.ca
L03:	Wed	2-4:00	PM	**TA:** Pinku Nath	**Email:** prantor@mail.ubc.ca
L04:	Fri	8-10:00	AM	**TA:** Zenab Kagdiwal	**Email:** zenabk@student.ubc.ca

Calendar Course Description

The five-layer Internet architecture using TCP/IP: application, transport, network, link, and physical. Topics include web protocols, network programming, routing, addressing, congestion control, error handling, Ethernet, wireless networks, security, multimedia transmission, and network management.
Prerequisite: All of COSC 211, COSC 222.

Course Format

Interactive classes consisting of topic introduction, understanding evaluation, and concept mastery with in-class and lab exercises. Practical skills and applications of topics are re-enforced with lab activities and project work.

Course materials are available on Canvas.
Midterm break and other calendar dates can be found at http://okanagan.students.ubc.ca/calendar/

Course Overview, Content and Objectives

This course introduces computer networks and a modern treatment of internetworking. The core concepts are covered according to the 5 layers of the Internet protocol stack: application, transport, network, link, and physical layers. The discussion begins with describing the top-level application layer and the numerous applications supported by the Internet. Then, each lower layer is presented to illustrate how the applications are supported. Core topics include routing, addressing and subnetting, protocols, connections, congestion control, and error handling. Additional topics are local area networks, wireless networks, security, multimedia transmission, and network management. Other than the core concepts, additional topics might be partially or fully covered based on the course schedule and class needs. Students will use network tools and construct network-based programs in the lab assignments. Throughout the course, students will work with software tools (online labs) which provides the opportunity for knowledge and skill synthesis resulting in a practical and functional showcase of acquired internetworking skills.

Learning Outcomes

Upon completion of this course, students will be able to:

- Understand basics of internet and network protocols
- Understand the principles of internet layers and main protocols
- Proficiency in principles of network applications
- Being able to write programs for network applications
- Exposure to Wireshark, the network protocol analyzer tool

Evaluation Criteria and Grading

Item	Percentage	Date
Quizzes	5%	Every month
Labs/Assignments	30%	Throughout the term
Midterm	30%	The week of Oct. 29 (tentative)
Final	35%	During Exam Period, TBA
Total	**100%**	

Final grades will be based on the evaluations listed above and the final grade will be assigned according to the standardized grading system outlined in the UBC Okanagan Calendar. **Attendance is expected both in lecture and labs (if you have questions or need help from TAs). Readings and Quizzes are to be completed prior to the lecture.**

Late Policy

Generally, late labs/assignments are not accepted. In case of extreme situations such as illness, childbirth, or bereavement, or by prior arrangement with the instructor, labs/assignments can be rescheduled.
Contacting me later than 3 days to the deadline or later than 3 days after the deadline will not be accepted

and no make-up work or extension will be considered.

The following policy is applied to late assignments without an excuse:

- **0 to 24 hours late:** 25% mark deduction (e.g., if an assign. is worth 20 marks, then 5 marks will be deductedregardless of the mark you get in the assignment; no negative marks will be given).
- **24 to 48 hours late:** 50% mark deduction
- **More than 48 hours:** no mark

Passing Criteria

In order to pass the course:

- Students MUST pass exam portion of the course. In other words, you must achieve 50% of the combined exams grade.

Expectations

Students expected to deliver the assignments on time and attend the quizzes.
The bottom line is to pass the final exam to pass the course.

Laboratories/Assignments Meeting Times

Labs will be held online. Labs start on Tuesday, September 14th, 2021. Please check your registration to determine your lab/tutorial section and time.

Final Examination

The 2021 Winter Term 1 final exam period will take place Saturday, December 11, 2021 through Wednesday, December 22, 2021**.** Except in the case of examination clashes and hardships (three or more formal examinations scheduled within a 24-hour period) or unforeseen events, students will be permitted to apply for out-of-time final examinations only if they are representing theUniversity, the province, or the country in a competition or performance; serving in the Canadian military; observing a religious rite; working to support themselves or their family; or caring for a family member. Unforeseen events include (but may not be limited to) the following: ill health or other personal challenges that arise during a term and changes in the requirements of an ongoing job.
Further information on **Academic Concession** can be found under **Policies and Regulation in the *Okanagan Academic Calendar*** http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,48,0,0

Tentative Course Schedule and Required Readings

The following table provides a tentative schedule for the term and may be adjusted dependent on the class needs. See the updated schedule on the course website.

Weeks	Topics
Week 1	**Topic 1:** Course overview, internet and network basics
Week 2	**Topic 2**: Application Layer – Layer 5: Principles of Network Applications, Well-known Applications, and Socket Programming
Week 3	**Topic 2:** continued **Topic 3:** Transport Layer – Layer 4: Transport-Layer services, Multiplexing and Demultiplexing, Principles of Reliable Data Transfer, TCP vs UDP, Congestion Control
Week 4	**Topic 3:** continued **Topic 4**: Network Layer (Data Plane) – Layer 3: Forwarding and Routing, Queuing, Internet Protocol (IP) addressing, Subnetting
Week 5	**Topic 4:** continued
Week 6	**Topic 5:** Network Layer (Control Plane) – Layer 3: Routing Algorithms, Inter-AS routing, BGP, SDN, ICMP and SNMP
Week 7	**Topic 5:** continued
Week 8	Midterm Exam
Week 9	**Topic 6:** Link Lay and LANs – Layer 2: Error Detection and Correction, Multiple Access Protocols, Switched Networks, ARP, and putting it all together (DHCP, UDP, IP, ARP, DNS, TCP and HTTP)
Week 10	**No class: Midterm Break**
Week 11	**Topic 7:** Wireless and Mobile Networks – Layer 1: Wireless links and Network Characteristics, 802.11 Wireless LANS, Cellular Internet Access, Mobility Management and Handoff.
Week 12	**Topic 8:** Security – Security Overview, Principles of Cryptography, Message Integrity and Digital Signatures (CHF, MACs and DS), End-Point Authentication, Secure email, SSL, IPsec and VPNs, Wireless LAN Security, Firewalls and IDS.
Week 13	**Topic 9:** Multimedia Networking – Applications, Streaming Stored Video, VOIP, Real-Time Protocols, and Network Support for Multimedia. **Final Exam Review**

Grading Practices

Faculties, departments, and schools reserve the right to scale grades in order to maintain equity among sections and conformity to University, faculty, department, or school norms. Students should therefore note that an unofficial grade given by an instructor might be changed by the faculty, department, or school. Grades are not official until they appear on a student's academic record.

http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,41,90,1014

Academic Integrity

The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you and acknowledging all sources of information or ideas and attributing them to others as required. This also means you should not cheat, copy, or mislead others about what is your work. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. For example, incidences of plagiarism or cheating may result in a mark of zero on the assignment or exam and more serious consequences may apply if the matter is referred to the President's Advisory Committee on Student Discipline. Careful records are kept in order to monitor and prevent recurrences.

A more detailed description of academic integrity, including the University's policies and procedures, may be found in the Academic Calendar at: http://okanagan.students.ubc.ca/calendar/index.cfm?tree=3,54,111,0.

Cooperation vs. Cheating

Working with others on assignments is a good way to learn the material and we encourage it. However, there are limits to the degree of cooperation that we will permit. Any level of cooperation beyond what is permitted is considered cheating.

When working on programming assignments, you must work only with others whose understanding of the material is approximately equal to yours. In this situation, working together to find a good approach for solving a programming problem is cooperation; listening while someone dictates a solution is cheating. You must limit collaboration to a high-level discussion of solution strategies, and stop short of actually writing down a group answer. Anything that you hand in, whether it is a written problem or a computer program, must be written by you, from scratch, in your own words. If you base your solution on any other written solution, you are cheating. If you provide your solution for others to use, you are also cheating.

Copyright Disclaimer

Diagrams and figures included in lecture presentations adhere to Copyright Guidelines for UBC Faculty, Staff and

Students http://copyright.ubc.ca/requirements/copyright-guidelines/ and UBC Fair Dealing Requirements for Faculty and Staff http://copyright.ubc.ca/requirements/fair-dealing/. Some of these figures and images are subject to copyright and will not be posted to ***Canvas.*** All material uploaded to ***Canvas*** that contain diagrams and figures are used with permission of the publisher; are in the public domain; are licensed by Creative Commons; meet the permitted terms of use of UBC's library license agreements for electronic items; and/or adhere to the UBC Fair Dealing Requirements for Faculty and Staff. Access to the ***Canvas*** course site is limited to students currently registered in this course. Under no circumstance are students permitted to provide any other person with means to access this material. Anyone violating these restrictions may be subject to legal action. Permission to electronically record any course materials must be granted by the instructor. Distribution of this material to a third party is forbidden.

Grievances and Complaints Procedures

A student who has a complaint related to this course should follow the procedures summarized below:

- The student should attempt to resolve the matter with the instructor first. Students may talk first to someone other than the instructor if they do not feel, for whatever reason, that they can directly approach the instructor.
- If the complaint is not resolved to the student's satisfaction, the student should e-mail the Associate Head, Dr. Yves Lucet at yves.lucet@ubc.ca or the Department Head, Dr. John Braun.

Student Service Resources

Disability Assistance

The Disability Resource Centre ensures educational equity for students with disabilities, injuries or illness. If you are disabled, have an injury or illness and require academic accommodations to meet the course objectives, e-mail us or visit our website for more information.
Web: http://students.ok.ubc.ca/drc/welcome.html **E-mail** DRC at: drc.questions@ubc.ca

Equity, Human Rights, Discrimination and Harassment

UBC Okanagan is a place where every student, staff and faculty member should be able to study and work in an environment that is free from human rights-based discrimination and harassment. If you require assistance related to an issue of equity, discrimination or harassment, please contact the Equity Office, your administrative head of unit, and/or your unit's equity representative. **UBC Okanagan Equity Advisor: ph. 250-807-9291**
Web: https://equity.ok.ubc.ca/ **E-mail:** equity.ubco@ubc.ca

Health & Wellness - UNC 337

At UBC Okanagan health services to students are provided by Health and Wellness. Nurses, physicians and counsellors provide health care and counselling related to physical health, emotional/mental health and sexual/reproductive health concerns. As well, health promotion, education and research activities are provided to the campus community. If you require assistance with your health, please contact Health and Wellness for more information or to book an appointment.
Web: www.students.ok.ubc.ca/health-wellness **Email:** healthwellness.okanagan@ubc.ca

Sexual Violence Prevention and Response Office (SVPRO)

A safe and confidential place for UBC students, staff and faculty who have experienced sexual violence regardless of when or where it took place. Just want to talk? We are here to listen and help you explore your options. We can help

you find a safe place to stay, explain your reporting options (UBC or police), accompany you to the hospital, or support you with academic accommodations. You have the right to choose what happens next. We support your decision, whatever you decide. Visit svpro.ok.ubc.ca or call us at 250-807-9640.

Independent Investigations Office (IIO)

If you or someone you know has experienced sexual assault or some other form of sexual misconduct by a UBC community member and you want the Independent Investigations Office (IIO) at UBC to investigate, please contact the **IIO**. Investigations are conducted in a trauma informed, confidential and respectful manner in accordance with the principles of procedural fairness. You can report your experience directly to the **IIO by** calling 604-827-2060.
Web: https://investigationsoffice.ubc.ca/ **E-mail:** director.of.investigations@ubc.ca

The Hub

The Student Learning Hub (LIB 237) is your go-to resource for free math, science, writing, and language learning support. The Hub welcomes undergraduate students from all disciplines and year levels to access a range of supports that include **tutoring in math, sciences, languages, and writing, as well as help with study skills and learning strategies**. **Web:** (https://students.ok.ubc.ca/student-learning-hub/) **Ph:** 250-807-9185.

SAFEWALK - Download the UBC SAFE – Okanagan app.
Don't want to walk alone at night? Not too sure how to get somewhere on campus?
Call Safewalk at 250-807-8076 For more information: https://security.ok.ubc.ca/safewalk/