ELEC 331 Computer Communications

- Introductory undergraduate course in computer networking
- Lecture: Monday and Wednesday, 2 – 3:30 pm in MCLD 2002
- Tutorial: Thursday, 5 – 7 pm in CEME 1202
- Instructor: Vincent Wong
  - Email: vincentw@ece.ubc.ca
  - Office: Room 4104, Kaiser Building
  - Office hour: Friday, 5 – 5:30 pm, or by appointment

Teaching Assistant

Mohammad Hossein Shokouhi (PhD student)

- email: mhshokouhi@ece.ubc.ca
- Office hour: Tuesday, 4 – 4:30 pm

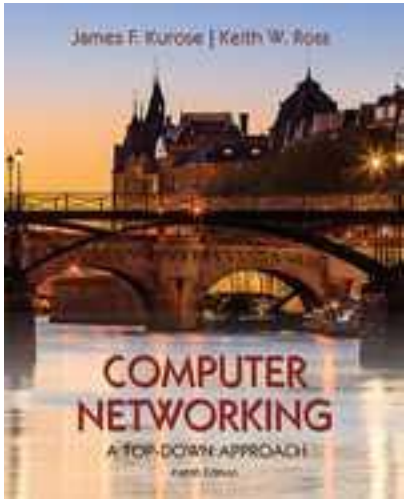
Course Learning Outcome

By the end of this course, you will be able to…

- Describe the design principles of the TCP/IP Internet
- Write simple applications by using Python programming
- Design and implement a reliable data transfer protocol
- Design and implement a routing protocol
- Collect and analyze protocols and packets by using the Wireshark software

Textbook

- J. F. Kurose and K. W. Ross, *Computer Networking: A Top-Down Approach Featuring the Internet*, 8th edition, Pearson, 2021.



- The book is being sold as an eText. You can purchase online access directly from the publisher's website. The link is as follows:

https://console.pearson.com/enrollment/o7tzos

Course Information (cont.)

- Course website: UBC Canvas

Course work	Approx. Number	Weight
Problem Sets	4 – 5	15%
Quizzes	4	45%
Final Exam		40%

- The quizzes will be held during the tutorial session. Closed book.
- The class signup link for Piazza is as follows:

https://piazza.com/ubc.ca/winterterm12024/elec_v3311012024w1

Problem Sets

- Questions will include problems from textbook, programming in Python, the use of WireShark.
- The time between each problem set uploaded on the course website and the due date is one week.
- Some questions may take a fair amount of time, please make sure you start early.
- Late penalty: 30% per day (one day only)
  - In future when you work in a company, there will be hard deadlines. Missing a deadline may cause a loss of market share, breach of contract with customers, etc. Try to develop a habit of finishing the work before the deadline.
- Plagiarism: Those students involved will get 0% for their assignment.
  - You are welcome to discuss with other students. Don't copy from one another.

Course Overview

Chapter 1 Introduction

- Terminologies, packet switching, circuit switching
- Delay and loss in packet-switched networks
- Protocol layers and their service models

Chapter 2 Application Layer

- HTTP, FTP (File Transfer Protocol); SMTP (Simple Mail Transfer Protocol); DNS (Domain Name Service)
- P2P file sharing; Video streaming and content distribution networks; Socket programming

Chapter 3 Transport Layer

- Multiplexing and de-multiplexing; Reliable data transfer
- UDP (User Datagram Protocol); TCP (Transmission Control Protocol); Congestion control

Course Overview (cont.)

Chapter 4 Network Layer: Data Plane

- Forwarding and routing; Internet protocol (IPv4, IPv6)
- Generalized forwarding and software-defined networking (SDN)

Chapter 5 Network Layer: Control Plane

- Routing protocols (distance vector, link state)
- SDN control plane

Chapter 6 Link Layer and LANs

- Error detection and correction techniques
- Multiple access protocols; Link layer addressing
- Ethernet; Data center networking

Summary and wrap up