Computer Networks-CS3001
Fall 2022

Course Outline

Instructor: Dr. Arshad Ali
Email: arshad.ali@lhr.nu.edu.pk
Office location: Faculty Office (C-140) Civil Building
Office Timings: Monday & Wednesday after 2:30 pm

TA Name
Email:
LAB Instructor:
Email:
LAB Instructor:
Email:

Course Information

Program: BS
Credit hours: 3+1 (LAB)
Type: Core
Class meeting time: Sec 5C: Monday, Wednesday: 11:30 am – 01:00 pm
Sec 5D: Monday, Wednesday: 1:00 am – 02:30 pm

Course website: Google Classroom
Class Venue: CS-5 / Google Meet
Pre-requisites: CS218 Data Structures, CL 218

Objective of the Course

The objective of this course is to introduce the principles and practices of Computer Networking, specifically focusing on the Internet. By the end of the course, students should be able to:

- Understand the anatomy of the Internet
- Understand fundamental layered structure, understand common offered layered services, examine protocols and algorithms used to operate the network
- Create foundation for more advanced courses in computer networks
- Be able to write networking application with Socket programming in C/C++
- Design and test networks on network designing tools
- Simulate existing protocols along with designing new protocols in network simulators

Course Learning Outcomes

The objective of this course is to introduce the principles and practices of Computer Networking, specifically focusing on the Internet. By the end of the course, students should be able to achieve the following CLOs:

CLO#	CLO description	BT Domain/ BT Level	PLO #
CLO 1	**Describe the key terminologies and technologies of computer networks**	**C2**	**PLO 1**
CLO 2	**Explain the services and functions provided by each layer in the Internet protocol stack**	**C2**	**PLO 1**
CLO 3	**Identify and analyze various internetworking devices and protocols, and their functions in a network**	C4	**PLO 2**
CLO 4	**Analyze working and performance of key technologies, algorithms and protocols**	**C4**	**PLO 2**
CLO 5	**Build Computer Network on various Topologies**	**P3**	**PLO 5**

Text Book

Computer Networking: A Top Down approach featuring the Internet, 6th Edition — James F. Kurose and Keith W. Ross

Reference book

Computer Networks, 5th Edition — Andrew Tanenbaum
Data Communications and Networking, 4th Edition — Behrouz A. Forouzan

Course Outline

Module	No. Of Lectures	Reference Text
Introduction and Overview Basic Concepts of Networking Circuit switching Packet switching Multiplexing (TDM, FDM) Throughput, Loss and delay Internet Architecture Protocol Layering	**4**	**Chapter 1** **Supplement text from Forouzan**
Application Layer Network application architectures HTTP, FTP, Email, DNS Basics of P2P applications	**4**	**Chapter 2**
Transport Layer Multiplexing in UDP and TCP Connectionless Transport: UDP Reliable data transfer and TCP Congestion avoidance and control	**7**	**Chapter 3**
Network Layer The Internet Protocol Routing algorithms Routing protocols Broadcasting and Multicasting	**8**	**Chapter 4**
Link Layer and MAC Layer Functionalities Error Detection & Control, ARP Link layer addressing Bridges and Hubs LAN Technologies Multiple Access	**5**	**Chapter 5** **Supplement text from Tenanbaum**
Advanced Topics (subject to availability of time) Introduction to Internet of things Multimedia networking Applications Introduction to Network Security and Principles of Cryptography Introduction to 1 G, 2G and 3G		**Chapter 7** **Supplement text from Tenanbaum/ Network security: private communication in a public world by Radia Perlman** [Subject to the availability of the time]

Evaluation (Subject to change)

Assignments	(4 to 6)	10%
Quizzes	(4 to 6)	15%
Mid Exams	(2)	30% (15% + 15%)
Final Exam	(1)	45%
Total:		**100 %**

Grading Policy

Absolute Grading Scheme

Course Policies

- Course outline may change 10-20% as we proceed in the semester
- Important: It is strived & intended to have uniform & similar weightages of different course components & grade assigning policy across all the sections for this course for the semester, but there may be variations owing to various factors, for example different number / types of assessments like assignments, home works, quizzes and/or projects.
- Assignment deadlines for both class and lab are hard.
- Quizzes might be announced or unannounced.
- There will be **no re-take** of quizzes or exams. Special consideration may be given only for mid or final exam for an emergency on per case basis subject to approval from the department administration & the instructor. In approved circumstances, percentage of mid will be awarded for final or vise versa.
- Integrity in the assignments/quizzes is expected; otherwise, result would be an F grade in the course or the case may be forwarded to the Disciplinary Committee.
- The lectures will be of 1.5 hours duration + there will be one 3 hours lab/week.
- (80%) Attendance for the student is a MUST which needs to be ensured according to the University policy to avoid disqualification.
- You may request an appointment according to my schedule by emailing me on the aforementioned email.