Computer Networks-CS3001
Fall 2024

Course Outline

Instructor: Dr. Arshad Ali
Email: arshad.ali@lhr.nu.edu.pk
Office location:
Office Timings:
LAB Instructor:
Email:

Course TA:
TA Email:
LAB TA 1:
Email:
LAB TA 2:
Email:

Course Information

Program: BS (CS)
Credit hours: 3+1 (LAB)
Type: Core
Class meeting day/time: Tuesday & Thursday:

Course website: Google Classroom
Class Venue: NB-310
Pre-requisites: CS218 Data Structures, CL 218

Program Learning Outcomes (PLOs)

This course covers the following PLOs:

PLO#	PLO Name	PLO description
PLO 2	Knowledge for Solving Computing Problems	Apply knowledge of computing fundamentals, knowledge of a computing specialization, and mathematics, science, and domain knowledge appropriate for the computing specialization to the 16 abstraction and conceptualization of computing models from defined problems and requirements.
PLO 4	Design/ Development of Solutions	Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

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** utilization of network protocol concepts vis-a-vis OSI and TCP/IP stack	**C2 (Understanding)**	**PLO 2**
CLO 2	**Demonstrate** the basics of network concepts using state-of-the-art network tools/techniques	**C3 (Applying)**	**PLO 2**
CLO 3	**Demonstrate** various classical routing and switching protocols via simulations	**C3 (Applying)**	**PLO 4**
CLO 4	**Apply** Socket Programming (client/server) to solve various real-world problems, including ensuring of data integrity	**C3 (Applying)**	**PLO 4**

Text Book

Computer Networking: A Top Down approach featuring the Internet, 8th 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 Intro to Transport Layer Services Multiplexing in UDP and TCP Connectionless Transport: UDP Reliable data transfer and TCP Congestion avoidance and control	**7**	**Chapter 3**
Network Layer: Data Plane Network layer overview The Internet Protocol IPv4 NAT Fragmentation Subnets DHCP IPv6 Generalized Forwarding Middle Boxes	**4**	**Chapter 4** **Supplement text from Forouzan**
Network Layer: Control Plane Router Control Plane Routing algorithms Routing protocols SDN Control plane ICMP	**5**	**Chapter 5**
Link Layer and MAC Layer Functionalities Error Detection & Control Link layer addressing and ARP Bridges and Hubs LAN Technologies Multiple Access	**6**	**Chapter 6** **Supplement text from Tenanbaum**

Evaluation (Subject to change)

Assignments	(5 to 7)	10%
Quizzes	(5 to 7)	10%
Mid Exams	(2)	30% (15% + 15%)
Final Exam	(1)	45%
Project	(1)	5%
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, homework, 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.
- 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 email.