

CSE 323/CSE 3711/EEE 4413: Computer Networks

Course outline for Summer 2024 onwards United International University (UIU)

Instructor: Professor Al-Sakib Khan Pathan, PhD

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Course Website

- Log in to your account at <http://www.lms.uiu.ac.bd>
- A student must use his university provided email address (name####id@bscse.uiu.ac.bd). In this email address, you will receive important messages from the course instructor through eLMS.
- You should be automatically enrolled to this course. If not, or registered later, use "1234" to be enrolled in the class.

Counseling Hours

- Check notice or file uploaded to LMS.

Text book

- **"Computer Networking: A top-down approach featuring the Internet", Kurose and Ross, 7th Edition, Addison Wesley, 2017. (KR)**

Reference books

- **"Automatic Defense against Zero-day Polymorphic Worms in Communication Networks", Mohssen Mohammed and Al-Sakib Khan Pathan, ISBN 9781466557277, CRC Press, Taylor & Francis Group, USA, 2013. (MP)**
- **"Computer Networks", Andrew S. Tanenbaum, Fifth Edition, Prentice Hall, 2013. (AT)**
- **"Computer Networks, A Systems Approach", Larry L. Peterson & Bruce S. Davie, Morgan Kaufmann Publishers (Elsevier), 5th Ed, ISBN-10:0123850592 | ISBN-13:978-0123850591. (PD)**

Evaluation

Attendance	5%
Class Tests	20%
Homeworks / Assignments	5%
Midterm	30%
Final	40%

Tests Policy

- Schedule of the **midterm**: Usually, 7th week of the semester
- **4 class tests** will be taken, **before and after mid**. **There will be no makeup for a class test.**
- **If you are absent during mid/final, and you have not informed me earlier, your grade for the exam will be zero.**

Grading

Letter Grade	Marks	Grade Point	Letter Grade	Marks	Grade Point
A (Plain)	90-100	4.0	C+ (Plus)	70-73	2.33
A- (Minus)	86-89	3.67	C (Plain)	66-69	2.00
B+ (Plus)	82-85	3.33	C- (Minus)	62-65	1.67
B (Plain)	78-81	3.00	D+ (Plus)	58-61	1.33
B- (Minus)	74-77	2.67	D (Plain)	55-57	1.00

Course Rationale: In the current information and mobility age, ubiquitous access to information is a reality and networked systems have become part of human existence. Lots of opportunities are growing day by day both in the industry and academic research in this area. To grab those opportunities, students must get a good knowledge of hardware and software interactions in complex networks, from the physical transmission of signals, through the protocols required for the safe transmission of data, to the end-to-end services built on the communications backbone. This course is designed to provide a stepping stone for students to learn the basic concepts of computer networks.

Course Objectives:

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

1. Build an understanding of the fundamental concepts of computer networking.
2. Master the basic taxonomy and terminology of the computer networking area.
3. Demonstrate a familiarity with contemporary issues in networking technologies.
4. Analyze different network tools, network programming and their performance.

Course Learning Outcomes:

1. **Identify** and **describe** the building blocks of Internet (Network Edge, Network Core) and **apply** the concepts of layered architecture (OSI and TCP/IP) in assessing the placement of network devices, protocols and services in communication networks.
2. **Demonstrate** the understanding of the client/server model and key application layer protocols.
3. **Compare** the services provided by the UDP/TCP transport layer protocols and **explain** the mechanisms used to provide a reliable data transport service on an unreliable IP network.
4. **Explain** the role of routing, congestion and flow control, naming and internetworking in the context of a global network such as the Internet, and the common protocols used to implement these functions.
5. **Explain** and **compare** data link layer services and multiple access techniques and **apply** them to both wired and wireless local area networks.

Topic Outline:

Lectures	Topics Or Assignments	CLOs	Readings	Activities
1, 2, 3, 4	Introduction: Basics in Networking, Topologies, TCP/IP and OSI Reference Models, Internet Protocol Stack, Circuit Switching vs. Packet Switching, FDMA, TDMA Physical Media, Encoding and Decoding, Delay and Packet Loss.	1	KR (Chapter 1) + MP (Chapter 2)	Q/A, Assignment, Problem solving session, CT 1
Date (as scheduled)	Class Test # 1			
5, 6, 7, 8	Application Layer: Service requirements, WWW, HTTP, Electronic Mail (SMTP), Domain Name System (DNS).	2	KR (Chapter 2)	Q/A, Problem solving session, CT 2
Date (as scheduled)	Class Test # 2			
9, 10, 11, 12	Transport Layer: Service Models, Multiplexing/ Demultiplexing, Connectionless Transport (UDP).	3	KR (Chapter 3)	Assignment, Problem Solving Session
Mid Term Assessment (December 11 to 19, 2021) –See Central Exam Routine for Date & Time				
13, 14, 15, 16	Transport Layer: Connection-oriented Transport (TCP), TCP Flow & Congestion Control	4	KR (Chapter 3)	Q/A, Assignment, Problem Solving Session, CT 3
Date (as scheduled)	Class Test # 3			
17, 18, 19, 20, 21	Network Layer: Routing and forwarding, IPv4 & IPv6, NAT, Fragmentation, Routing algorithms, Routing in the Internet.	5	KR (Chapter 4 & 5)	Q/A, Assignment, Problem Solving Session, CT 4
Date (as scheduled)	Class Test # 4			
22, 23, 24	Link Layer and Local Area Networks: Link layer services, MAC Protocols, Link layer addressing Ethernet, CSMA/CD, ARP.	5	KR (Chapter 6)	Q/A, Assignment, Problem Solving Session, CT 5
Final Assessment (As per department Schedule) –See Central Exam Routine for Date & Time				