University of Dhaka
Department of Computer Science and Engineering

CSE-3101: Computer Network [3.0 credits, 45 Hours Lecture]

Every Monday and Wednesday @8:30am in Room 420

Book: Computer Networking – A Top-Down Approach (8th Edition) by Kurose and Ross

Lec	Content
1.	- Networking and Socialization, sharing course administration and guidelines - What's the Internet? What's a protocol? Network edge, network core; Access net, physical media;
2.	Internet/ISP structure; Performance: loss, delay; Protocol layers, service models, network modeling and fundamentals of network security
3.	Principles of network applications: app architectures and app requirements; Web and HTTP;
4.	File Transfer Protocol (FTP) and Electronic Mail: SMTP, POP3, IMAP
5.	Domain Name System (DNS); P2P file sharing;
6.	Socket programming with TCP, Socket programming with UDP and Building a Web server
7.	Transport-layer services, Multiplexing and de-multiplexing; Connectionless transport: UDP
8.	and Principles of reliable data transfer , Connection-oriented transport (TCP): segment structure, reliable data transfer
9.	Principles of flow control, connection management, Principles of congestion control
10.	TCP congestion control Algorithms: TCP Tahoe and TCP Reno
11.	Principles of UDP Communications, UDP Checksum and Internet Checksum
12.	Evolution of Transport layer functionality and Problem solving on practical problems related to Application and Transport layer protocols
13.	Introduction to Network layer functionalities: Routing, Forwarding, Connection setup; Virtual circuit and datagram networks; What's inside a router? Organization and functionalities of a router.
14.	IP: Internet Protocol - Datagram format, IPv4 addressing, CIDR, sub and super-netting
15.	DHCP, NAT, and ICMP
16.	IPv6 – header format, changes compared to IPv4, Transition from IPv4 to IPv6, Tunneling, Security, etc
	INCOURSE EXAMINATION
17.	Routing algorithms: Link state Routing, Distance Vector Routing and Hierarchical routing Algorithms
18.	Routing in the Internet – Autonomous Systems, RIP, OSPF and BGP fundamentals

18.	Generalized Forwarding and Software Defined Networking, SDN Control plane, Open Flow Protocol, Interaction between data and control planes of SDN
19.	Introduction to Wireless and Mobile Networks, Elements of a wireless network; Wireless Link standards and their characteristics; CDMA;
21.	IEEE 802.11a/b/g systems; IEEE 802.11 MAC Protocol – CSMA/CA; CSMA/CA with RTS/CTS; Cellular network architecture – 4G, 5G and beyond systems.
22.	Introduction to network security – Confidentiality, Authentication, Message Integrity, Access and Availability;
23.	Principles of cryptography – Plaintext, ciphertext, symmetric key and asymmetric key cryptography, Encryption and decryption algorithms
24.	Fundamentals of Application, transport and network layer security issues.
25.	Message Integrity and Digital Signatures
26	Access Control: Firewalls, Attacks and counter measures, Cybersecurity
27-30	Reviews, Problem solving practices, Assignments/Presentations, etc.

Marks Distribution

Incourse Exams (20 Marks):

Class Attendance (5 Marks):

Assignments/Presentations (5 Marks):

Final Examination (70 Marks):

Course Teacher

Prof. Dr. Md. Abdur Razzaque

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