COURSE HANDOUT

COMPUTER NETWORKS (ECE-603)

ECE-6TH SEMESTER

ACADEMIC YEAR (2024-2025)

Ms Gurpreet Raina

Assistant Professor

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Department of Electronics & Communication Engineering

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S. No.	Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
								Sessional	Final Exam	Total
3	ECE-603	Computer Networks	ESC	4	3	1	0	50	100	150

Course Outcomes:

At the end of the course the student will be able to:	
CO1	Articulate the fundamental concepts in computer networks and justify their layered implementation.
CO2	Appreciate the challenges involved and available protocols for facilitating low-level data communication.
CO3	Analyze the design issues in ensuring error free data construction, deconstruction and transmission across devices.
CO4	Justify the application of appropriate routing algorithms in different scenarios based on through Understanding of prevalent routing algorithms.
CO5	Articulate the role of higher network layers in the OSI models and the working of common network Applications.

Detailed   Syllabus
Section A

Unit 1: Introduction to Data Communication-Data Communication system, synchronous and asynchronous systems, serial and parallel system, Computer network and uses, categories of computer networks, protocol and standards, Dataflow-simplex, half-duplex, full-duplex, computer, Network Topologies, Reference Model-OSI and TCP/IP reference model, comparison and critique.

(10 Hrs)

Unit 2: Physical Layer: Data Transmission-Digital to Digital Conversion-Line Coding Scheme, Transmission Media, RS-232 Interface, Switching mechanisms and Comparison –circuit, packet, message, Modem and its types.

(8 Hrs)

Unit 3: Data Link Layer: Error Detection and Correction, Flow Control-Elements of data link Protocols, Multiple Access Protocol-Random & controlled access protocols-ALOHA, CSMA, IEEE standards-802.3, 802.4, 802.5.

(10 Hrs)

Section B

Unit 4: Network Layer: Routing Algorithms–the optimality principle, shortest path algorithm, flooding, distance vector routing, link state routing and hierarchical routing, Sliding window protocol Congestion Control- principles prevention policies, Techniques to improve QoS, IP addressing, IPV4 and IPV6, Subnetting.

(10 Hrs)

Unit 5: Transport & Application Layer: Services, Primitives, Issues, elements of transport protocol, Introduction to TCP and UDP, Design Issues, FTP, DNS, E-Mail, SMTP, HTTP, WWW and Firewalls.

(8 Hrs)

Text Books

S. No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Computer Networking with Internet Protocols and Technology	W. Stallings	Pearson Education	2nd (2009)
2	Data Communication and Networking	Behrouz A. Forouzan	McGraw-Hill	4th (2007)

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Reference Books

S. No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Computer Networking: A Top-Down Approach Featuring the Internet	Kurose & Ross	Pearson Education	7th (2017)
2	Computer Networks and Internets with Internet Applications	Coumar & Douglas	Pearson	4th (2014)

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COURSE PLAN	
Unit-I Introduction	
S. No	**Topics**	**Recommended Books**
1	Data Communication-communication system	Book 1, Ch.1
2	Synchronous and asynchronous systems	Book 1, Ch.5
3	Dataflow	Book 1, Ch.1
4	Uses of computer network	Book 1, Ch.1
5	categories of computer networks	Book 1, Ch.12
7	Reference Model-OSI and TCP/IP	Book 1, Ch.15
8	Network Topologies	Book 1, Ch.12
Unit-II Physical layer		
9	Digital to Digital Conversion-Line Coding Scheme	Book 1, Ch.2
10	Transmission Media	Book 1, Ch.2
11	Switching mechanisms and Comparison	Book 1, Ch.8
12	Modem and its types.	Book 1, Ch.8
Unit-III Data Link layer		
13	Error Detection and Correction	Book 1, Ch.6
14	Flow Control-Elements of data link protocol	Book 1, Ch.6
15	Sliding Window Protocol	Book 1, Ch.6
16	HDLC	Book 1, Ch.6
17	Channel Allocation Problems	Book 2, Ch.2
18	Multiple Access Protocols	Book 2, Ch.2
Unit-IV Network Layer		
19	Routing Algorithms	Book 1, Ch.9
20	Routing Algorithms	Book 1, Ch.9

21	Flooding & distance vector routing	Book 1, Ch.9
22	link state routing and hierarchical routing	Book 1, Ch.9
23	Congestion Control	Book 1, Ch.10
24	Traffic shaping algorithm	Book 1, Ch.10
25	QOS	Book 1, Ch.10
26	IP protocol	Book 1, Ch.16
27	Internetworking devices	Book 1, Ch.16
	Unit-V Transport, Session, Presentation and Application Layer	
28	Transport Layer Services Primitives	Book 1, Ch.17
29	Elements of transport	Book 1, Ch.17
30	Introduction to TCP and UDP	Book 1, Ch.17
31	FTP& DNS,	Book 1, Ch.17
32	E-Mail	Book 1, Ch.17
33	Introduction to WWW	Book 1, Ch.17
34	Firewalls	Book 1, Ch.17

ADDITIONAL WEB RESOURCES

1.	**NPTEL:** Video lectures on Computer Networks Lecture series by Prof. Sujoy Ghosh, IIT Kharagpur. http://nptel.ac.in/courses/106105081
2.	**SOFTWARE LINK**: Link of Cisco Packet Tracer: https://www.netacad.com/courses/packet-tracer
3	Computer Network tutorial http://www.studytonight.com/computer-networks/

GRADING AND ASSESSMENT

- **Sessional Test**: 15 marks
- **Assignment**: 10 marks
- **Attendance**: 5 marks
- **Final Examination**: 70 marks

COURSE POLICIES

- **Attendance**: Minimum 75% attendance is mandatory to appear in the final examination of the course.
- **Academic Integrity**: MIET's academic integrity policies apply. Plagiarism will not be tolerated.
- **Late Submissions**: Assignments and projects must be submitted by the specified timelines.

FACULTY INFORMATION

- **Office Hours**

  Monday (12:05 PM - 12:55 PM)

Friday (12:05 PM - 12:55 PM)

- **Contact Information**
  gurpreetraina.ece@mietjammu.in