

DEPARTMENT OF CSE- DATA SCIENCE

COURSE MODULE FOR THE SESSION 2023-2024 (ODD SEM)

Course Syllabi with CO's

Faculty Name:				Academic Year: 2023 - 2024			
Department: Computer Science & Engineering							
Course Code	Course Title	Core/Elective	Prerequisite	Contact Hours			Total Hrs/ Sessions 60(40T+20P)
				L	T	P	
21CS52	Computer Networks	IPCC		3	-	2	
Course Learning Objectives	This course will enable students to: CLO 1. Fundamentals of data communication networks. CLO 2. Software and hardware interfaces CLO 3. Application of various physical components and protocols CLO 4. Communication challenges and remedies in the networks.						
Topics Covered as per Syllabus							RBT
Module-1 Introduction to networks: Network hardware, Network software, Reference models, Physical Layer: Guided transmission media, Wireless transmission Textbook 1: Ch.1.2 to 1.4, Ch.2.2 to 2.3 Laboratory Component: 1. Implement Three nodes point – to – point network with duplex links between them for different topologies. 1Set the queue size, vary the bandwidth, and find the number of packets dropped for various iterations. Module-2 The Data link layer: Design issues of DLL, Error detection and correction, Elementary data link protocols, Sliding window protocols. The medium access control sublayer: The channel allocation problem, Multiple access protocols. Textbook 1: Ch.3.1 to 3.4, Ch.4.1 and 4.2 Laboratory Component: 1. Implement simple ESS and with transmitting nodes in wire-less LAN by simulation and determine the throughput with respect to transmission of packets. 2. Write a program for error detecting code using CRC-CCITT (16- bits). Module-3 The Network Layer: Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, QoS. Textbook 1: Ch 5.1 to 5.4 Laboratory Component: 1. Implement transmission of ping messages/trace route over a network topology consisting of 6 nodes and find the number of packets dropped due to congestion in the network. 2. Write a program to find the shortest path between vertices using bellman-ford algorithm Module-4 The Transport Layer: The Transport Service, Elements of transport protocols, Congestion control, The internet transport protocols. Textbook 1: Ch 6.1 to 6.4 and 6.5.1 to 6.5.7 Laboratory Component: 1. Implement an Ethernet LAN using n nodes and set multiple traffic nodes and plot congestion window for different source / destination. 2. Write a program for congestion control using leaky bucket algorithm. Module-5 Application Layer: Principles of Network Applications, The Web and HTTP, Electronic Mail in the Internet, DNS—The Internet’s Directory Service. Textbook 2: Ch 2.1 to 2.4							L3
							L3
							L3
							L3
							L3
List of Text Books							
1. Computer-Networks- Andrew S. Tanenbaum and David J. Wetherall. Pearson Education. 5thEdition.							

(www.pearsonhighered.com/tanenbaum)

2. Computer Networking A Top-Down Approach -James F. Kurose and Keith W. Ross Pearson Education 7th Edition.

List of Reference Books

1. Behrouz A Forouzan, Data and Communications and Networking, Fifth Edition, McGraw Hill, Indian Edition
2. Larry L Peterson and Bruce S Davie, Computer Networks, fifth edition, ELSEVIER

List of URLs, Text Books, Notes, Multimedia Content, etc

1. <https://www.digimat.in/nptel/courses/video/106105183/L01.html>
2. <http://www.digimat.in/nptel/courses/video/106105081/L25.html>
3. <https://nptel.ac.in/courses/106105081>
4. VTU e-Shikshana Program

Course Outcomes (CO's)

At the end of the course the student will be able to:

- CO 1. Learn the basic needs of communication system.
- CO 2. Interpret the communication challenges and its solution.
- CO 3. Identify and organize the communication system network components
- CO 4. Design communication networks for user requirements.

Assessment Details (both CIE and SEE): The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together Continuous Internal Evaluation: Three Unit Tests each of 20 Marks (duration 01 hour) 1. First test at the end of 5th week of the semester 2. Second test at the end of the 10th week of the semester 3. Third test at the end of the 15th week of the semester Two assignments each of 10 Marks 4. First assignment at the end of 4th week of the semester 5. Second assignment at the end of 9th week of the semester Practical Sessions need to be assessed by appropriate rubrics and viva-voce method. This will contribute to 20 marks.

- Rubrics for each Experiment taken average for all Lab components – 15 Marks.
- Viva-Voce– 5 Marks (more emphasized on demonstration topics)

The sum of three tests, two assignments, and practical sessions will be out of 100 marks and will be scaled down to 50 marks (to have a less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course). CIE methods /question paper has to be designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

The Correlation of Course Outcomes (CO's) and Program Outcomes (PO's)

Subject Code:	21CS52	TITLE: Computer Networks										
List of Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO-1	2	-	-	-		-	-	-	-	-	-	-
CO-2	2	2	3	-	3	-	-	-	-	-	-	2
CO-3	2	2	2	-	3	-	-	-	-	-	-	-
CO-4	2	2	2	-	3	-	-	-	-	-	-	2

Note: 3 = Strong Contribution 2 = Average Contribution 1 = Weak Contribution - = No Contribution

The Correlation of Course Outcomes (CO's) and Program Specific Outcomes (PSO's)

Subject Code:	21CS52	TITLE: Computer Networks
List of Course Outcomes	Program Specific Outcomes	
	PSO1	PSO2
CO-1	-	2
CO-2	-	2
CO-3	-	2
CO-4	-	2