



Course Syllabus
Gyanmanjari College of Computer Science
Semester-4(BSC IT)

Subject: Data Communication and Network-BSCIT14314

Type of course: Minor Stream

Prerequisite: Basic Knowledge of Computer Networks and Hardware, Security

Rationale:

This course imparts a unified systems view of the broad field of data and computer communications. The fundamental principles of data communications are thoroughly presented and then applied in data communication networking.

Teaching and Examination Scheme:

Teaching Scheme				Credits	Examination Marks					Total Marks		
CI	T	P	C		SEE		CCE					
					Theory	Practical	MSE	LWA	ALA			
3	0	2	4	75	25	30	20	50	200			

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; SEE - Semester End Evaluation; MSE- Mid Semester Examination; LWA - Lab Work Assessment; V – Viva voce; CCE- Continuous and Comprehensive Evaluation; ALA- Active Learning Activities.

Course Content:

Sr. No	Course content	Hrs	% Weightage
1	Fundamentals of Computer Networking Introduction, History of Network, characteristics, Features ,Computer Network Types, LAN , MAN, PAN, WAN, Computer Network Architecture,Computer Network Components, Network Topology	12	30%
2	Network Application Layer And Model Introduction Models, Layered Architecture, Advantages and Disadvantages, OSI Model , TCP/IP model, SMTP, FTP,DNS, Electronic Mail WWW, TELNET (Terminal Network),client- Server Models, Routing,Intranets And Extranets.	12	30%



3	The Medium Access Control Sub layer Wireless LANS, Bluetooth, IEEE 802.11 Protocol Layers, Magnetic Media, Twisted Pair Cable, Coaxial Cable, PowerLines, Fiber Optics, Radio Transmission, Microwave Transmission, Infrared Transmission, Light Transmission, Multiplexing in Computer Network.	10	20%
4	Computer Network Security Network Security , Advantages, Privacy, Message Integrity, End-point authentication, Non-Repudiation, Network Security Implemented: Secret Key Cryptography, Public Key Cryptography, Message Digest Tools and Software for Network Security: Firewalls, Access Control, Virtual Private Networks (VPN)	11	20%

Continuous Assessment:

Sr. No	Active Learning Activities	Marks
1	Real-World Network Analysis: Students will Analyze and make report on real-world Network Tool and upload it on GMIU Web Portal.	10
2	Poster making: Students will prepare a poster on any network topic and upload it on GMIU Web Portal. (Group of four)	10
3	Micro Project: Students will prepare a mini network using any of the network devices with the proper configuration and prepare its video; Students have to upload that video on GMIU Web Portal.(Group of four)	10
4	MCQ Test: Networking Related 30 MCQ questions will be given; Students have to attend that test on the GMIU Web Portal.	10
5	Case Study: Student have to do a case study on “How to Secure your network ?”; students have to upload that document on GMIU Web Portal.	10
Total		50

Suggested Specification table with Marks (Theory):75

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	25%	45%	15%	15%	0	0



Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcome:

After learning the course the students should be able to:	
CO1	Understand the core concepts of computer networks, including network types, architectures, and topologies, and their historical evolution.
CO2	Compare and contrast OSI and TCP/IP models, and demonstrate the functionalities of key network application protocols such as SMTP, FTP, DNS, and TELNET.
CO3	Assess various transmission media (e.g., twisted pair, fiber optics, wireless) and protocols like IEEE 802.11 for their applicability in different networking scenarios.
CO4	Implement basic network security measures, utilizing tools like firewalls and VPNs, and understand cryptographic techniques for ensuring data privacy and integrity.

List of Practical:

Sr. No	Descriptions	Hrs
1	Connect computer using given topology with wired media. Assume six devices are arranged, if in: a) bus topology b) ring topology c) star topology d) mesh topology Find out number of cables(links), ports needed in each device and total number of ports needed in entire network for each of above stated topology.	4
2	Study about OSI model network Layers.	2
3	Prepare and Test Twisted Pair Cable, Coaxial Cable, Power Lines, Fiber Optics.	4
4	Study and Test various Network devices. (Repeater, Hub, Switch, Bridge, Router and Gateway).	4
5	Study of firewall in providing network security.	2
6	Run basic utilities and network commands in cmd: ipconfig, ping, tracert, netstat, pathping, route.	2
7	Introduction to Cisco Packet Tracer.	2
8	Configure a simple network with PCs, switches, and routers using Cisco Packet Tracer.	2
9	Set up a Local Area Network (LAN) with multiple switches and devices using Cisco Packet Tracer.	4
10	Configure VLANs to segregate network traffic using Cisco Packet Tracer.	4
		30



Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming etc..

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory

The internal evaluation will be done on the basis of Active Learning Assignment

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

Reference Books:

1. Data Communication and Computer Networks - 4th Edition - Brijendra Singh
2. Computer Networks - 4th Edition - Andrew S. Tanenbaum

