Course Name: EE-347,**Computer Networks**

Credit Hours: 2-1

Contact Hours: 2-3

Pre-requisites: None

Course Introduction:

In the "Computer Networks" course, students will first gain a solid understanding of various network topologies, architectures, and protocols to effectively select the most suitable option for specific network design challenges. Next, they will comprehend the intricacies of data transmission and reception across different network layers and develop the skills to diagnose and resolve network-related issues. Furthermore, students will apply their knowledge in configuring transport layer protocols like TCP and UDP, as well as implementing flow and congestion control mechanisms, along with application layer protocols such as HTTP, FTP, SMTP, and DNS, using socket programming. Lastly, students will delve into the realm of network security, where they will grasp the concepts of cryptography and security protocols such as SSL/TLS and IPSec, and apply them to safeguard network communications and data integrity.

CLO No	Course Learning Outcomes	Bloom Taxonomy
CLO-1	Understand different network topologies, architectures, and protocols, and choose the appropriate one for a given network design problem.	C1 (Knowledge)
CLO-2	Understand how data is transmitted and received across different network layers, and identify and resolve network-related problems.	C3 (Apply)
CLO-3	Apply configuration of transport layer protocols such as TCP and UDP, and flow and congestion control, and application layer protocols such as HTTP, FTP, SMTP, and DNS, and socket programming.	C3 (Apply)
CLO-4	Understand, identify and apply cryptography and security protocols such as SSL/TLS and IPSec.	C3 (Apply)

Course Plan:

#	Weekly Distribution of Course Contents
Week-1	Introduction to Computer Networks
Week-2	Network concepts and architecture
Week-3	OSI and TCP/IP reference models

Week-4	Network topologies and protocols
Week-5	Network layers (Physical, Data Link)
Week-6	Network layers (Transport, Application layers)
Week-7	Wireless and Mobile Networks
Week-8	Network security threats and attacks
Week-9	Cryptography and network security protocols
Week-10	Network management functions and services
Week-11	Network performance and quality of service
Week-12	Cloud computing and applications
Week-13	Security concerns in Cloud computing
Week-14	Software and Hardware Virtualization techniques
Week-15	Software-defined networking (SDN),
Week-16	Internet of Things (IoT) network

Reference Materials:

1. "Computer Networking: A Top-Down Approach" by James F. Kurose and Keith W. Ross (7th edition, 2021)

2. "Computer Networks" by Andrew S. Tanenbaum and David J. Wetherall (5th edition, 2011)

3. "Network Security Essentials: Applications and Standards" by William Stallings (6th edition, 2016)

4. "Computer Networking Problems and Solutions: An innovative approach to building resilient, modern networks" by Russ White and Ethan Banks (2017)