SCHEME OF COURSE WORK

Course Details:

Course Title	**: Computer Networks**		
Course Code	**: 13CS2201**	**L T P C**	**: 4 0 0 3**
Program:	**: M.Tech.**		
Specialization:	**: Cyber Security**		
Semester	**: Ist Semester**		
Prerequisites	**: Computer Networks.**		
Courses to which it is a prerequisite	**: Data Communication Networks, Computer Networks.**		

Course Outcomes (COs):

1	Understand Basics of Computer Networks and different Transmission Media.
2	Differentiate Protocols which play a major role in providing internet effectively.
3	Understand various protocol layers and inner operations.
4	Understand architectures of network protocols.
5	Understand security issues in network protocols.

Program Outcomes (POs):

A graduate of Cyber Security Specialization will be able to

1	Understand what are the common threats faced today.
2	The foundational theory behind Cyber security
3	The basic principles and techniques when designing a secure system,
4	How to think adversarial, how today's attacks and defenses work in practice, how to assess threats for their significance, and how to gauge the protections and limitations provided by today's technology
5	The basic principles and techniques in ethical hacking and overcome various hackers
6	Learn various security methodologies to enhance the security of web.
7	Basic principles of cyber laws and security policies
8	Various scripting languages to develop programs for security mechanisms.
9	Various tools and methodologies to analyze the various cyber crimes
10	Secure protocols inner mechanisms and their practical implementation
11	Various Forensic technologies and methodologies for security measurements analyzation.
12	.Intrusion detection techniques and image model security aspects in Android application developments.

Course Outcome versus **Program Outcomes:**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO-1			S			S						
CO-2	M	M	S							S		M
CO-3			M							S		M
CO-4		S		S								
CO-5												S

S - Strongly correlated, *M* - *Moderately* correlated, *Blank* - *No correlation*

Assessment Methods:	Assignment / Quiz / Seminar / Case Study / Mid-Test / End Exam

Teaching-Learning and Evaluation

Week	TOPIC / CONTENTS	Course Outcomes	Sample questions	TEACHING-LEARNING STRATEGY	Assessment Method & Schedule
1	**NETWORK MODELS**: Layered Tasks, WAN, LAN, MAN.	CO-1	1. Explain about networks models.	▫ Lecture ▫ Demonstration	Assignment (Week 3 - 4)
2	OSI model, TCP/ IP protocol, stack addressing, Novell Networks Arpanet, Internet.	CO-2	1. Explin about OSI and TCP/IP models. 2. Explain about addressing and Novell networks. 3. Describe about Internet in detail.	▫ Lecture / Discussion ▫ Programs implentation	Mid-Test 1 (Week 9)
3	**PHYSICAL LAYER**: Transmission media: copper, twisted pair, Wireless, switching and encoding asynchronous communications.	CO-1, CO-2	1. Explain about Transmission media. 2. Describe about switching and wireless communication. 3. Explain about encoding asynchronous communications.	▫ Lecture ▫ Programs implementation	Seminar (Week 3 - 6)
4	Narrow band ISDN, broad band ISDN and ATM.	CO-2	1. Describe about Narrow and Broad band ISDN. 2. Explain about ATM in physical layer.		
5	**DATA LINK LAYER:** Design issues, framing, error detection and correction, CRC, Elementary data link protocols.	CO-2	1. Write about design issues of data link layer. 2. Explain about framing, error detection and error correction in data link layer. 3. Describe about elementary data link protocols.		
6	Sliding Window Protocol, Slip, HDLC, Internet, and ATM. **MEDIUM ACCESS SUB LAYER:** Random access, Controlled access, Channelization.	CO-2,CO-3	1. Explain about sliding window protocol. 2. Explain about the terms Slip, HDLC, Internet. 3. Describe about medium access layer types. 4. Explain about channelization.		
7	IEEE 802.X Standards, Ethernet, wireless LANS, Bridges. **NETWORK LAYER:** Network Layer Design Issues.	C0-3, CO-4	1. Write about IEEE 802.X standards and Ethernet. 2. Describe about wireless LANS and Bridges. 3. Explain about Network layer design issues.		
8	Routing Algorithms, Internetworking, Network Layer in Internet.	CO-3, CO-4	1. Explain about various Routing algorithms. 2. Write about Internetworking and Network layer in internet.		
9	**Mid-Test 1**				
10	**CONGESTION CONTROL**: General Principles, policies, traffic shaping, flow specifications.	CO-3	1. Explain about congestion control principles and policies. 2. Describe about traffic shaping and flow specifications of congestion control.	▫ Lecture ▫ Discussion	Mid-Test 2 (Week 18)
11	Congestion control in virtual subnets, choke packets, loads shedding, jitter control.	CO-3	1. Write about Choke packets and congestion control in virtual subnets. 2. Explain about loads shedding and jitter control.		Seminar (Week 10 - 15)
12	**TRANSPORT LAYER:** Transport Services, Elements of Transport Protocols.	CO-3	1. Write about transport services and elements of transport protocols.		

13	Internet Transport Protocols (TCP & UDP), ATM AAL Layer Protocol.	CO-3	1. Explain about Internet Transport Protocols with a neat diagrams. 2. Briefly describe about ATM AAL layer protocol.		
14	**APPLICATION LAYER:** Network Security, Domain name system	CO-4, CO-5	1. How network should be secure in application layer. 2. What is DNS and explain with an example.		
15	SNMP, Electronic Mail: the World WEB, Multi Media	CO-4	1. Write about Email and WWW. 2. Explain about SNMP protocol. 3. What is Multimedia and explain it.		
16	**SONET/SDH:** SONET/SDH Architecture, SONET Layers	CO-4, CO-5	1 .Briefly explain about the architecture of SONET/SDH. 2. What are the layers of SONET and describe them.		
17	SONET Frames, STS Multiplexing, SONET Networks.	CO-5	1. Explain about SONET frames with neat diagrams. 2. Explain about STS Multiplexing with neat diagram. 3. Explain about SONET networks.		
18	**Mid-Test 2**				
19/20	**END EXAM**				