NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF COMPUTER APPLICATIONS

COURSE PLAN – PART I			
Name of the programme and specialization	**Master of Computer Applications**		
Course Title	**Computer Networks**		
Course Code	**CA 718**	**No. of Credits**	**3**
Course Code of Pre-requisite subject(s)	**-**		
Session	**Jan 2023**	**Section (if, applicable)**	**-**
Name of Faculty	**Dr. Vinay Raj**	**Department**	**Computer Applications**
Official Email	**vinayraj@nitt.edu**	**Telephone No.**	**9963850192**
Name of Course Coordinator(s) (if, applicable)	**Dr. Sindhia Lingaswamy**		
Official E-mail	sindhia@nitt.edu	**Telephone No.**	**9940220299**
Course Type (please tick appropriately)	☑ **Core course**	☐ **Elective course**	

Syllabus (approved in BoS)

Introduction to Computer Networks: Basics of Computer Networks - Problems associated with computer networks: Communication problems, Identification problems, and Connection problems – Network protocol basics – Service identification – MAC Address - IPv4 Addressing System, Subnetting and Super netting, IPv6 Addressing System - Network requirements: Network interface card (NIC), Media, and Networking devices – Hub, Switch, and Routers.

Network Topologies and Network Architectures: Network Topologies – Bus, Star, Ring, Mesh – Network Architectures – Client/Server Architecture, Peer-To-Peer Architecture - Open System Interconnect (OSI) Reference Model - TCP/IP Model - TCP Operation - UDP Operation – Flow Control – Congestion Control.

Local Area Networks: LAN components – Packet Switching and Forwarding – LAN Technologies - Ethernet, Token Bus, Token Ring, Wireless LAN – Multiple Access Protocols – Error-Detection and Correction Techniques.

Wide Area Networks: WAN Components – WAN Technologies - WAN Encapsulation - Routing: Static Routing and Dynamic Routing - Routed Protocols (IP and IPX) - Routing Protocols.

Protocols: Address Resolution Protocol (ARP) Protocol - Dynamic Host Configuration Protocol (DHCP)- Domain Name System (DNS) – Internet Protocol (IP) – Internet Control Message Protocol (ICMP) - Hypertext Transfer Protocol (HTTP) - File Transfer Protocol (FTP) - Simple Mail Transfer Protocol (SMTP), Remote Administration Protocols: Telnet and Secure Shell (SSH).

References:

1. Behrouz A. Forouzan, “Data Communications and Networking”, 5th Edition, McGraw-Hill, July 2017.
2. James F. Kurose and Keith W. Ross, “Computer Networking - A Top-Down Approach”, 8th Edition, Pearson, 2020.
3. William Stallings, “Data and Computer Communications” 10th Edition, Pearson, 2013.
4. Andrew S. Tanenbaum, David J. Wetherall, “Computer Networks”, 6th Edition, Pearson, 2020.
5. Chwan-Hwa Wu, J. David Irwin, “Introduction to Computer Networks and Cybersecurity”, 1st Edition, CRC Press, 2013.

COURSE OBJECTIVES

- To learn various network architectures, protocols, and the functions of different networking layers in line with IEEE standards.

MAPPING OF COs with POs

Course Outcomes	**Programme Outcomes (PO)** (Enter Numbers only)
1. List the functionalities of networking layers available in both OSI reference model and TCP/IP model.	**1, 2, 3, 4, 5**
2. Describe available LAN and WAN Technologies.	**1, 2, 3, 5**
3. Describe the principles of packet switching, forwarding, and routing.	**1, 3, 4**
4. Distinguish between TCP and UDP packet formats.	**2, 4, 5**
5. Describe the available application protocols and networking services.	**1, 2, 3, 5**

COURSE PLAN – PART II

COURSE OVERVIEW

This course covers topics on computer networks including network architectures, OSI, LAN, error detection and correction, wireless networks, Switching, routing and protocols.

COURSE TEACHING AND LEARNING ACTIVITIES (Add more rows)

S.No.	**Week/Contact Hours**	**Topic**	**Mode of Delivery**
1	Week 1 - 3 hrs	Introduction to Computer Networks: Basics of Computer Networks - Problems associated with networks: Communication problems, Identification problems, and Connection problems	C & T
2	Week 2 - 3 hrs	Network protocol basics – Service identification – MAC Address - IPv4 Addressing System, Subnetting and Super netting, IPv6 Addressing System	C & T
3	Week 3 - 3 hrs	Network requirements: Network interface card (NIC), Media, and Networking devices – Hub, Switch, and Routers.	C & T
4	Week 4 - 3 hrs	Network Topologies and Network Architectures: Network Topologies – Bus, Star, Ring, Mesh – Network Architectures – Client/Server Architecture, Peer-To-Peer Architecture	C & T

5	Week 5 - 3 hrs	Open System Interconnect (OSI) Reference Model - TCP/IP Model	C & T
6	Week 6 - 2 hrs + Assessment **I**	TCP Operation - UDP Operation – Flow Control – Congestion Control.	C & T
7	Week 7 - 3 hrs	Local Area Networks: LAN components – Packet Switching and Forwarding – LAN Technologies - Ethernet, Token Bus, Token Ring	C & T
8	Week 8 - 3 hrs	Wireless LAN – Multiple Access Protocols – Error-Detection and Correction Techniques.	C & T
9	Week 9 - 3 hrs	Wide Area Networks: WAN Components – WAN Technologies - WAN Encapsulation	C & T
10	Week 10 - 2 hrs + Assessment **II**	Routing: Static Routing and Dynamic Routing	C & T
11	Week 11 - 3 hrs	Routed Protocols (IP and IPX) - Routing Protocols. Protocols: Address Resolution Protocol (ARP) Protocol - Dynamic Host Configuration Protocol (DHCP)	C & T
12	Week 12 - 3 hrs	Domain Name System (DNS) – Internet Protocol (IP)	C & T
13	Week 13 - 3 hrs	Internet Control Message Protocol (ICMP) - Hypertext Transfer Protocol (HTTP)	C & T
14	Week 14 - 3 hrs	File Transfer Protocol (FTP) - Simple Mail Transfer Protocol (SMTP), Remote Administration Protocols: Telnet and Secure Shell (SSH).	C & T

COURSE ASSESSMENT METHODS (shall range from 4 to 6**)**

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Cycle Test 1	As per Schedule	1 hr	20
2	Cycle Test 2	As per Schedule	1 hr	20
3	Assignment / Test 3	Week 10-13	-	10
4 CPA	Compensation Assessment*	As per Schedule	1 hr	20

5	Final Assessment *	As per Schedule	3 hrs	50

***mandatory; refer to guidelines on page 4**

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

The students through the class representative may give their feedback at any time to the course chairman which will be duly addressed.

The students may also give their feedback during class committee meeting

COURSE POLICY (including compensation assessment to be specified)

Students absent for both the cycle tests with a valid reason may be given CPA and It will cover the portion of cycle tests 1 and 2.

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

ACADEMIC DISHONESTY & PLAGIARISM

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.
- The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION, IF ANY

The students can get their doubts clarified at any time with their faculty member with prior appointment

FOR APPROVAL

Course Faculty _____ **CC- Chairperson** _____ **HOD** _____

Head of the Department
Dept.of Computer Applications
National Institute of Technology
Tiruchirappalli - 620 015.
Tamilnadu, India.

DEPT. Of C.A. TRICHY 620 015 N.I.T.