NATIONAL INSTITUTE OF TECHNOLOGY: TIRUCHIRAPPALLI –620 015.
Department of Computer Science & Engineering

COURSE PLAN

1. Course Outline			
Course Title	Internetworking Protocol		
Course Code	CSPC32		
Department	CSE	**No. of Credits**	3-0-0-3
Pre-requisites Course Code	Data Communications and Networks	**Faculty Name**	Dr. S. Selvakumar
E-mail	ssk@nitt.edu	**MobileNo.**	+91-9489600124
Course Type	PC		

2. Course Overview

This course deals with in depth study of design of protocol for MAC layer, Network Layer, Transport layer, and Application layer. The design principles of IEEE 802 standard protocols, IPv4, TCP/IP, IPv6, and mobile IP protocols will also be dealt with.

3. Course Objectives

- To provide insight about networks, topologies, and the key concepts
- To gain comprehensive knowledge about the layered communication architectures (OSI and TCP/IP) and its functionalities
- To understand the principles, key protocols, design issues, and significance of each layers in ISO and TCP/IP
- To know the implementation of various layers

4. Course Outcomes (CO)

- Ability to gain insight about basic network theory and layered communication architectures
- Ability to code and implement MAC protocols, IPv4, IPv6, and TCP
- Ability to design and develop Mobile IP
- Ability to design and develop a communication protocol

5. Course Outcome (CO)	**Aligned Programme Outcome (PO)**							
	PO-1	**PO-2**	**PO-3**	**PO-4**	**PO-5**	**PO-6**	**PO-7**	**PO-8**
Ability to gain insight about basic network theory and layered communication architectures	M	B	S	S	M	M	M	M
Ability to code and implement MAC protocols, IPv4, IPv6, and TCP	S	B	S	S	M	M	M	M
Ability to design and develop Mobile IP	M	B	S	S	M	M	M	M
Ability to design and develop a communication protocol	S	B	S	S	M	M	M	M

S = 0.6 M = 0.4 B = 0.0

5. Course Teaching and Learning Activities

Weeks	hours	Title	Mode of Delivery
1	1	Introduction of faculty and students	Chalk and board
	2	Motivation	Chalk and board
	3	Introduction to course, Scheme of evaluation, etc. Definition of network	Chalk and board, PPT
2	4	Advantages of Network, NOS, Distributed Operating Systems, illustration	Chalk and board, PPT
	5	Data. Text, Image. Audio. Video Characteristics and Bandwidth requirement	Chalk and board, PPT
	6	Communication types, Simplex, Half Duplex, Full Duplex, Modes – Unicast, Broadcast, Multicast, Anycast, Multiplexing, FDM	Chalk and board, PPT
3	7	TDM, STDM, Async. TDM	Chalk and board, PPT
	8	Examples for FDM, TDM, Hybrid, Transmission, SDLC, HDLC, and bit oriented/Character oriented Bit Stuffing, Destuffing	Chalk and board, PPT
	9	Circuit switching Concept, Time-line Chart, Problem solving	Chalk and board, PPT
4	10	Message switching, Packet switching, Timeline Chart, illustration	Chalk and board, PPT
	11	Virtual Circuit switching, Comparison of switching techniques, Topologies, Collision Vs. Congestion	Chalk and board, PPT
	12	Tasks of Communication, Error detection & Correction, Flow Control, Addressing	Chalk and board, PPT
5	13	Routing, Recovery, Security, Utilization, N/W management, ISO OSI seven-layer Architecture	Chalk and board, PPT
	14	Transmission Media Characteristics Comparison	Chalk and board, PPT
	15	LAN Protocols, Need for MAC Protocol, Mechanisms of Control implementation	Chalk and board, PPT
6	16	ALOHA, Slotted ALOHA, Prortocols	Chalk and board, PPT
	17	MAC protocols, 1-Persistent, Non-persistent, P-Persistent	Chalk and board, PPT
	18	CSMA/CD protocols	Chalk and board, PPT
7	19	CSMA/CD collision Resolution, Binary back off, State Transition Diagram, Carrier Sense, MAC Format	Chalk and board, PPT
	20	Token Bus Protocol, Functions, Addition, Deletion, Token Management, Ring Initialization	Chalk and board, PPT
	21	Token Ring Protocol, Single Priority, Multiple Priority, Message transmission	Chalk and board, PPT
8	22	Slotted Ring, Register Insertion Technique, Interworking Terminologies	Chalk and board, PPT
	23	Bridges Vs Repeaters, Why Bridges, Multiple Bridges Vs Multiple Links, General Interconnection Issues	Chalk and board, PPT
	24	Specific Interconnection Issues, Bridge Protocol Architecture	Chalk and board, PPT
9	25	Fixed Routing, Central Routing Matrix, Routing Table in Bridges, Adv. & Disadvantage.	Chalk and board, PPT

	26	Address Learning Bridges, Frame Forwarding, Problem due to closed loop, Spanning Tree bridges, Terminologies, BPDU, Best BPDU choosing Algorithm	Chalk and board, PPT
	27	Illustration of Spanning Tree Creation with two examples	Chalk and board, PPT
10	28	Source Routing, Route discovery & Selection, Frame format, Comparison with Transparent bridge	Chalk and board, PPT
	29	IP, Header Format	Chalk and board, PPT
	30	IP Forwarding, RT search Alg., Examples	Chalk and board, PPT
11	31	Subnetting, Supernetting, Forwarding using Subnet Mask, CIDR	Chalk and board, PPT
	32	ARP, RARP cache, Proxy ARP, Gratitous ARP, RARP, Server implementation	Chalk and board, PPT
	33	Routing Protocols, Distance Vector protocol, Illustration, RIP, Message Format, RIP v2	Chalk and board, PPT
12	34	Link State Protocols, OSPF, LSP creation, Dissemination, shortest path calculation, LSP message format	Chalk and board, PPT
	35	Tutorial on Network Layer, Subnet address Assignment, Routing	Chalk and board, PPT
	36	Tutorial on ARP, DNS, Message Format, Flags, Resources Records, UDP, TCP Ports	Chalk and board, PPT
13	37	Multicast, Definition, Classification, Permanent, Transient, Closed, Open, NLMCA, DLMCA Routing	Chalk and board, PPT
	38	Resource Discovery, Flooding, RPF, Extended RPF, Multicast Backbone, CBT, PIM	Chalk and board, PPT
14	39	Introduction to TCP, Iterative, Concurrent server, UDP	Chalk and board, PPT
	40	Pseudo header, Server Design, TCP header	Chalk and board, PPT
	41	TCP Connection Establishment, Termination, Active open, Passive open, Passive close, Half close	Chalk and board, PPT
15	42,43	TCP State Transition Diagram, Interactive Dataflow, Nagle's Algorithm, Bulk Dataflow, Sliding Window, Flow Control	Chalk and board, PPT
	44,45	Timers, Retransmission RTO Calculation, Retransmission Ambiguity Problem, Slow Start, Congestion Avoidance, Fast transmit, Fast Recovery, TCP Persist Timer, Silly Window Syndrome, TCP keep Alive Timer	Chalk and board, PPT

6. Course Assessment Methodology

Sl. No	Mode of Assessment	Week/Date	Duration	Marks
1.	Cycle Test-1	5^{th} week	1 Hour	20
2.	Cycle Test-2	11^{th} week	1 Hour	20
3.	Term Project (Group of not more than three)	Two weeks before the commencement of end sem exam	DEMO	10
4.	End Semester Exam	November last Week	3 Hours	50
			Total	100

7.Essential Readings

Text Book

1. W. Richard Stevens and G. Gabrani, "TCP/IP Illustrated: The Protocols", Pearson, 2011
2. Peter Loshin, Morgan Kaufmann, "IPv6: Theory, Protocol, and Practice", 2nd Ed, 2003
3. James Solomon, "Mobile IP: The Internet Unplugged", 1st Ed, Pearson Education, 2008

Course Exit Survey
Student feedback form will be collected at the end of the course through MIS. Further the feedback from students will be collected in class committee meetings.

Course Policy
Attendance- Students having a minimum of 75% attendance are eligible for writing the End semester. Students having less than 75% must redo the course. Student should not absent for the assessment. If the reason for absence is genuine, the student can reappear for reassessment.

For Senate's Consideration

S. Selvakumar
Course Faculty
19 07 17

CC Chairperson
19/7/17

HOD
19/7/2017