KADI SARVA VISHWAVIDYALAYA

B.E. Semester: VI
Electronics & Communication Engineering
Subject Name : Data Communication and Networking
Subject Code : EC-606   W.E.F 2014-15

A. **Course Objective:**

The educational objectives of this course are

- To present introductory knowledge of Computer networks.
- To explain different type of Modals & theirs layers.

B. **Teaching / Examination Scheme:**

SUBJECT		Teaching Scheme				Total Credit	Evaluation Scheme				Total Marks
		L	T	P	Total		THEORY	IE	CIA	PR. / VIVO	
CODE	NAME	Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	
EC-606	Data Communication and Networking	4	0	2	6	5	3	70	30	20	30	150

C. **Detailed Syllabus:**

1   **INTRODUCTION:**
Network Hardware, Topology, Network Software, Reference Models, Example Networks, Uses of Computer Networks, ARPANET, Connection Oriented Networks, X.25, Frame Relay, ATM.

2   **PHYSICAL LAYER**:
 The Theoretical Basis for Data Communication, The Public Switched Telephone Network, The Mobile Telephone System

3   **DATA LINK LAYER:**
Data Link Layer Design Issues, Error Detection and Correction, Elementary Data Link Protocols, Sliding Window Protocols, Example Data Link Protocols

4   **MEDIUM ACCESS CONTROL SUB LAYER:**
The Channel Allocation Problem, Multiple Access Protocols, Ethernet, Wireless LANs, Broadband Wireless, Bluetooth, RFID, Data Link Layer Switching.

5   **NETWORK LAYER:**
Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, Quality of Service, Internetworking, The Network Layer in the Internet.

6   **TRANSPORT LAYER**:
The Transport Service, Elements of Transport Protocols, Congestion Control Algorithms, The Internet Transport Protocols: UDP, The Internet Transport Protocols: TCP, Performance Issues, Delay Tolerant Networks.

7 APPLICATION LAYER:
DNS--The Domain Name System, The World Wide Web, Real-time Audio and Video, Content Delivery and Peer-To-Peer, SMTP and HTTP Protocol.

8 NETWORK SECURITY:
Cryptography, Symmetric-Key Algorithms, Public-Key Algorithms, Digital Signatures, Management Of Public Keys, IPsec, Firewalls, Virtual Private Networks, Wireless Security, Security Issues And Challenges in Wireless Networks, Authentication Protocols, Email Security, Web Security, Social Issues.

D. **Lesson Planning**

Sr. No.	No. of Hrs.	% Weight-age in Exam	Topics
1	5	10	**INTRODUCTION:** Network Hardware, Topology, Network Software, Reference Models, Example Networks, Uses of Computer Networks, ARPANET, Connection Oriented Networks, X.25, Frame Relay, ATM.
2	6	10	**PHYSICAL LAYER**: The Theoretical Basis for Data Communication, The Public Switched Telephone Network, The Mobile Telephone System
3	7	10	**DATA LINK LAYER:** Data Link Layer Design Issues, Error Detection and Correction, Elementary Data Link Protocols, Sliding Window Protocols, Example Data Link Protocols
4	11	15	**MEDIUM ACCESS CONTROL SUB LAYER:** The Channel Allocation Problem, Multiple Access Protocols, Ethernet, Wireless LANs, Broadband Wireless, Bluetooth, RFID, Data Link Layer Switching.
5	11	20	**NETWORK LAYER:** Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, Quality of Service, Internetworking, The Network Layer in the Internet.
6	7	15	**TRANSPORT LAYER**: The Transport Service, Elements of Transport Protocols, Congestion Control Algorithms, The Internet Transport Protocols: UDP, The Internet Transport Protocols: TCP, Performance Issues, Delay Tolerant Networks.
7	5	10	**APPLICATION LAYER**: DNS--The Domain Name System, The World Wide Web, Real-time Audio and Video, Content Delivery and Peer-To-Peer, SMTP and HTTP Protocol.
8	8	10	**NETWORK SECURITY:** Cryptography, Symmetric-Key Algorithms, Public-Key Algorithms, Digital Signatures, Management Of Public Keys, IPsec, Firewalls, Virtual Private Networks, Wireless Security, Security Issues And Challenges in Wireless Networks, Authentication Protocols, Email Security, Web Security, Social Issues.
TOTAL	60	100	

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E. Instructional Method & Pedagogy (ANNEXURE-I)

F Suggested list of Experiments

1	To study about different physical equipment used for networking.
2	To study OSI reference model and TCP/IP reference model.
3	To Connect two pc using peer to peer communication.
4	To Study & implement the following network topologies with advantages & disadvantages.
5	Write a program to generate CRC code for checking error.
6	To plot Efficiency of pure Aloha and slotted Aloha in MATLAB.
7	To plot Channel Efficiency for Ethernet in MATLAB.
8	To Configure a connection between two PCS thru routers in Boson simulator.
9	To Implementation RIP Algorithm in Boson simulator.
10	To study RSA – Public Key Cryptography Algorithm

G : Students Learning Outcomes

On successful completion of the course

The student can identify different areas of Data Communication and Networking Can find the applications of all the areas in day to day life. Can identify the working algorithms,. aspects of different layers and network security.

H: Recommended Study Materials

Text/ Reference Books:
1. Computer Networks, Andrew Tanenbaum, 5th Edition, Pearson Education.
2. Data Communication And Networking, Behrouz Forouzan, 4th Edition, TMH.
3. Introduction to Data Communication and Networking, Wayne Tomasi, Pearson

ANNEXURE - I

Instructional Method & Pedagogy:

- At the start of course, the course delivery pattern , prerequisite of the subject will be discussed

- Lecture may be conducted with the aid of multi-media projector, black board, OHP etc. & equal weight age should be given to all topics while teaching and conduction of all examinations.

- One internal exam may be conducted and total/average/best of the same may be converted to equivalent of **30 marks** as a part of internal theory evaluation.

- Attendance is compulsory in lectures and laboratory, which may carries **05 marks** in overall evaluation.

- Assignment based on course content will be given to the student for each unit/topic and will be evaluated at regular interval. It may carry an importance of **10 marks** in the overall internal evaluation.

- Surprise Quizzes/ Seminar/ Tutorial may be conducted and having share of **05 marks** in the overall internal evaluation.

- Experiments shall be performed in the laboratory related to course contents.