



**Kadi Sarva Vishwavidyalaya**  
**Faculty of Engineering & Technology**  
 Electronics and communication Engineering  
 (Academic Year 2019-20)

<b>Subject Code: EC605-N</b>	<b>Subject Title: DATA COMMUNICATION AND NETWORKING</b>
<b>Pre-requisite</b>	

**Course Objective:**

The educational objectives of this course are

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

**Teaching Scheme (Credits and Hours)**

Teaching scheme				Total Credit	Evaluation Scheme					Total Marks
L	T	P	Total		Theory		IE Marks	CIA Marks	Pract. Marks	
Hrs	Hrs	Hrs	Hrs		Hrs	Marks				
03	00	02	05	04	03	70	30	20	30	150

**Outline Of the Course:**

Sr. No.	Title of the Unit	Hours
1.	Introduction	04
2.	Physical Layer	05
3.	Data Link Layer	06
4.	Medium Access Control Sub Layer	10
5.	Network Layer	10
6.	Transport Layer	05
7.	Application Layer	04
8.	Network Security	04
		<b>48</b>

**Total hours (Theory): 48**

**Total hours (Lab): 16\*2=32**

**Total hours: 80**



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**Detailed Syllabus:**

Unit No.	Topics	Lecture Hours	Weight age(%)
1.	<b>INTRODUCTION:</b> Network Hardware, Topology, Reference Models, Example Networks, Uses of Computer Networks, ARPANET, Connection Oriented Networks, X.25, Frame Relay, ATM.	04	10
2.	<b>PHYSICAL LAYER:</b> The Theoretical Basis for Data Communication, The Public Switched Telephone Network, The Mobile Telephone System	05	10
3.	<b>DATA LINK LAYER:</b> Data Link Layer Design Issues, Error Detection and Correction, Elementary Data Link Protocols, Sliding Window Protocols, Example Data Link Protocols	06	10
4.	<b>MEDIUM ACCESS CONTROL SUB LAYER:</b> The Channel Allocation Problem, Multiple Access Protocols, Ethernet, Wireless LANs, Broadband Wireless, Bluetooth, RFID, Data Link Layer Switching.	10	20
5.	<b>NETWORK LAYER:</b> Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, Quality of Service, Internetworking, The Network Layer in the Internet.	10	20
6.	<b>TRANSPORT LAYER:</b> 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.	05	10
7.	<b>APPLICATION LAYER:</b> DNS--The Domain Name System, The World Wide Web, Real-time Audio and Video, Content Delivery and Peer-To-Peer, SMTP and HTTP Protocol.	04	10
8.	<b>NETWORK SECURITY:</b> Cryptography, Symmetric-Key Algorithms, Public-Key Algorithms, Digital Signatures, Firewalls, Virtual Private Networks, Wireless Security, Security Issues And Challenges in Wireless Networks, Authentication Protocols, Email Security, Web Security, Social Issues.	04	10
<b>Total</b>		<b>48</b>	<b>100</b>



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### Instructional Method and Pedagogy:

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lecture and laboratory which carries 10 marks in overall evaluation.
- One internal exam will be conducted as a part of internal theory evaluation.
- Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
- Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.

### 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.

### TEXT BOOKS & REFERENCE BOOKS:

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

### List of Experiments (Not limited to following. Subject teacher may modify the same):

Sr. No.	Experiment Title
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 and implementation of 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