



Department of Information Technology		LP: IT18501 Rev. No: 00
B.E/B.Tech/M.E/M.Tech : Information Technology	Regulation:2018	Date:10.06.2020
PG Specialisation : NA		
Sub. Code / Sub. Name : IT18501 DATA COMMUNICATION AND NETWORKING		
Unit : I		

Unit Syllabus: FUNDAMENTALS AND SIGNAL TRANSMISSION

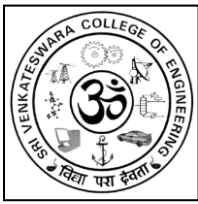
Fundamentals : Building a network – Requirements – Layering and protocols – OSI Model – Internet Architecture – Network Topology ; Physical Layer: Transmission Media; Data Link Layer: Framing – Error Detection and Correction

Objective:

To Study about building a networked system along with concepts needed for physically transmitting a data over a network

Session No *	Topics to be covered	Ref	Teaching Aids
1	Fundamentals: Building a network-Requirements	1 - ch 1;pg 1-23	PPT
2	Requirements for building a network	1 - ch 1;pg 1-23	PPT
3	Layering and protocols -OSI Model: Physical layer, Data link layer, Network layer	1 - ch 1;pg 24-28	PPT
4	OSI Model: Transport layer, Session layer, Presentation layer, Application layer	1 - ch 1;pg 28-33	PPT
5	Internet Architecture	1- ch 1;pg 33 -36	PPT
6	Network Topology	1 - ch 1;pg 13-16	PPT
7	Physical Layer: Transmission Media-Guided – Unguided media.	1 - ch 1;pg 71-78	PPT
8	Data Link Layer: Framing	1 - ch2.3;pg78-91	PPT
9	Data Link Layer: Framing - HDLC, PPP, SDLC	1 - ch2.3;pg78-91	PPT
10	Error Detection-Introduction-Two dimensional parity, Internet checksum	1 - ch 2.4;pg 91-97	PPT
11	Error Detection-Introduction-Two dimensional parity, Internet checksum	1 - ch 2.4;pg 91-97	PPT
12	Error Correction - Cyclic redundancy check	1 - ch 2.4;pg 97-102	PPT
Content beyond syllabus covered (if any):			

* Session duration: 50 minutes



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Unit : II

Unit Syllabus: MEDIA ACCESS AND LOGICAL LINK CONTROL

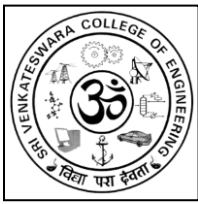
Media access control – Ethernet (802.3) – Wireless LANs – 802.11 – Switching and bridging – Flow control – CIDR – ARP – DHCP - ICMP

Objective:

To discuss about the data link layer implementation in LAN and WAN.

Session No *	Topics to be covered	Ref	Teaching Aids
13	Media access control- Ethernet – standard Ethernet –fast Ethernet-gigabit Ethernet	1-ch 2.6;pg 119-128	PPT
14	Wireless LAN (802.11)-Architecture-layers –addressing	1-ch 2.7;pg 128-142	PPT
15	Switching and bridging-circuit switching - datagram switching – virtual circuit switching – switch structure – bridges	1-ch 3.1;pg 170-203	PPT
16	circuit switching - datagram switching – virtual circuit switching –switch structure – bridges	1-ch 3.1;pg 170-203	PPT
17	Flow control – stop and wait - sliding -window protocols	1-ch 2.5;pg 102-119	PPT
18	sliding -window protocol	1-ch 2.5;pg 102-119	PPT
19	CIDR – Internetwork – Service Model – Global addresses	1-ch 3.2 ;pg 203-212	PPT
20	CIDR – Datagram forwarding – Subnetting – Classless addressing	1-ch 3.2 ;pg 212-227	PPT
21	ARP – Address resolution protocol, Reverse address resolution protocol	1-ch 3.2 ;pg 227-231	PPT
22	DHCP – Dynamic host configuration protocol	1-ch 3.2 ;pg 231-235	PPT
23	ICMP –Internet Control Message Protocol	1-ch 3.2 ;pg 235-238	PPT
24	ICMP –Internet Control Message Protocol	1-ch 3.2 ;pg 235-238	PPT

Content beyond syllabus covered (if any): WiMax



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Unit : III

Unit Syllabus: ROUTING AND ADDRESSING SCHEMES

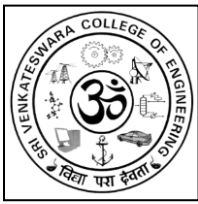
Basic Internetworking (IPv4, IPv6) - Routing (RIP, OSPF, metrics) – Multicast – Multicast routing (DVMRP, PIM)

Objective:

To study about how millions of nodes can be connected to form a scalable routing System.

Session No *	Topics to be covered	Ref	Teaching Aids
25	Basic Internetworking -IPv4 – class and addressing schemes – subnetting and supernetting	1-ch 3.2;pg 203-227	PPT
26	class and addressing schemes – subnetting and supernetting	1-ch 3.2;pg 203-227	PPT
27	IPv6 – addressing schemes – auto configuration – advanced routing capabilities	1-ch 4.1;pg 324-337	PPT
28	Routing – RIP – Route Information Protocol	1-ch 3.3;pg 240-252	PPT
29	Routing – RIP – Route Information Protocol	1-ch 3.3;pg 240-252	PPT
30	Problems on RIP	1-ch 3.3;pg 240-252	PPT
31	OSPF – Open shortest path first algorithm - Metrics	1-ch 3.3;pg 252-267	PPT
32	OSPF – Open shortest path first algorithm - Metrics	1-ch 3.3;pg 252-267	PPT
33	Problems on OSPF	1-ch 3.3;pg 252-267	PPT
34	Multicast – addresses	1-ch 4.2;pg 338-341	PPT
35	Multicast routing - DVMRP, PIM	1-ch 4.2;pg 341-353	PPT
36	Multicast routing - DVMRP, PIM	1-ch 4.2;pg 341-353	PPT

Content beyond syllabus covered (if any): Socket Programming



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Unit : IV

Unit Syllabus: TRANSPORT & APPLICATION LAYER

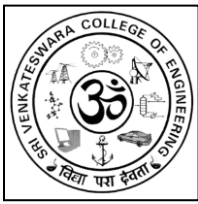
Overview of Transport layer – UDP – Reliable byte stream (TCP) – Connection management – TCP Congestion control – Electronic Mail (SMTP, POP3, IMAP, MIME) – DNS - HTTP

Objective:

To study about various protocols that enable process to process delivery of data and discuss about various issues and challenges involved in it.

Session No *	Topics to be covered	Ref	Teaching Aids
37	Overview of Transport layer – UDP – User Datagram Protocol	1-ch 5;pg 391-396	PPT
38	Reliable byte stream – TCP – Transmission Control Protocol	1-ch 5.2;pg 396-413	PPT
39	Transmission Control Protocol	1-ch 5.2;pg 396-413	PPT
40	Connection management – TCP Extensions	1-ch 5.2;pg 413-431	PPT
41	Connection management – TCP Extensions	1-ch 5.2;pg 413-431	PPT
42	TCP – Congestion Control	1-ch 6;pg 499-514	PPT
43	Electronic Mail – SMTP – Simple Mail Transfer Protocol	1-ch 6;pg 698-702	PPT
44	Electronic Mail - POP3, IMAP, MIME	1-ch 6;pg 702-708	PPT
45	DNS – Domain Name System -	1-ch 9pg 745-756	PPT
46	overview-services-records-messages –address mapping –message format	1-ch 9pg 745-756	PPT
47	HTTP – Hyper Text Transfer Protocol	1-ch 9;pg 708-718	PPT
48	overview-connections-message format	1-ch 9;pg 708-718	PPT

Content beyond syllabus covered (if any): Transport protocols for Real time traffic



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Unit : V

Unit Syllabus: SOFTWARE DEFINED NETWORKS

Introduction to SDN – Control and Data Planes – VMWare – Network Function Virtualization –Virtualization and Data Plane I/O.

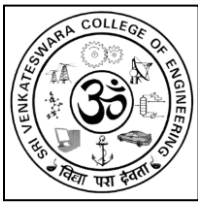
Objective :

To understand about Software Defined Network and learn about performs of the Network Virtualization.

Session No *	Topics to be covered	Ref	Teaching Aids
49	Introduction to SDN	2- ch 1;pg 1-8	PPT
50	Control and Data Planes –Distributed Control Plans – Centralized Control Planes	2-ch 2;pg 9- 44	PPT
51	Distributed Control Plans – Centralized Control Planes	2-ch 2;pg 9- 44	PPT
52	VMWare	2-ch 4;pg 75-79	PPT
53	VMWare - features	2-ch 4;pg 75-79	PPT
54	Network Function Virtualization - Virtualization and Data Plane I/O	2-ch 7;pg 207-2013	PPT
55	Network Function Virtualization -Services Engineered Path - Service Locations and Chaining	2-ch 7;pg 214-219	PPT
56	Network Function Virtualization -Metadata-An Application Level Approach-Scale	2-ch 7;pg 219-223	PPT
57	Network Function Virtualization -NFV at ETSI -Non-ETSI NFV Work	2-ch 7;pg 223-229	PPT
58	Network Function Virtualization –Middle box Studies - Embrane/LineRate	2-ch 7;pg 229-232	PPT
59	Network Function Virtualization - vendors available	2-ch 7;pg 233- 238	PPT
60	- Platform Virtualization	2-ch 7;pg 233- 238	PPT

Content beyond syllabus covered (if any):

* Session duration: 50 mins



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Course Outcome 1: Understand the concepts of network architecture and transmission medium.

Course Outcome 2: Learn about various link layer technologies.

Course Outcome 3: knowledge of addressing scheme and learn various routing protocols in data communication to select optimal path.

Course Outcome 4: Learn the flow control and congestion control algorithms.

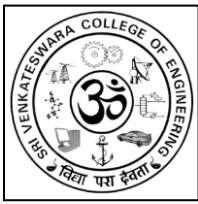
Course Outcome 5: Understand with real time applications of networks.

Course Outcome 6 : Abstract the control plane and analyze the network function virtualization

Mapping CO – PO:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												
CO6												



A – Strong ; B – Moderate; C - weak

**TEXT BOOKS:**

1. Larry L. Peterson, Bruce S. Davie, "Computer Networks: A Systems Approach", Fifth Edition, Morgan Kaufmann Publishers, 2011.
2. Thomas D Nadeau, Ken Gray, "SDN: Software Defined Networks", First Edition, O'Reilly, 2013.

REFERENCE BOOKS:

3. James F. Kurose, Keith W. Ross, "Computer Networking - A Top-Down Approach Featuring the Internet", Fifth Edition, Pearson Education, 2009.

	Prepared by	Approved by
Signature		
Name	Ms. P. Leela Rani & Ms. G. Sangeetha	DR V. VIDHYA
Designation	ASSISTANT PROFESSOR	PROFESSOR
Date		
Remarks *:		
Remarks *:		

* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD