Kadi Sarva Vishwavidyalaya
Faculty of Engineering & Technology
Third Year Bachelor of Engineering (Computer Engineering)
(In Effect From Academic Year 2019-20)

Subject Code: CE605F-N	Subject Title: Advanced Computer Networks
Pre-requisite	Computer Networks

Teaching Scheme (Credits and Hours)

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

Course Objective:

➢ To understand the significance and usage of computer networks at an advance level.
➢ This course aims to provide advanced background on relevant computer networking topics to have a comprehensive and deep knowledge in computer networks.
➢ To understand the services and the network management being offered.
➢ To have understanding of different routing protocols.

Outline of the Course:

Sr. No	Title of the Unit	Minimum Hours
1	Optical Networking	6
2	ATM: The WAN Protocol	8
3	Packet Switching Protocols	5
4	Protocols and Interfaces in Upper Layers of TCP/IP	4
5	Routing in the Internet and Routing Techniques	5
6	Network Management and Services	4
7	Traffic Engineering Basics	6
8	Introduction to the Cisco IOS.	3
9	IP Routing.	3
10	Dynamic Routing Protocols.	4

Total hours (Theory): 48
Total hours (Lab): 32
Total hours: 80

Detailed Syllabus

No	Topic	Lecture (Hrs)	Weightage (%)
1	**Basic Overview of network fundamentals Optical Networking** Introduction to Optical Networking, (DQDB) Distributed Queue Dual bus, SONET / (SDH) Synchronous Digital hierarchy Standard	6	13
2	**ATM: The WAN Protocol** Introducing ATM Technology, Faces of ATM Explaining the basic concepts of ATM Networking, B-ISDN reference model Explaining the Physical Layer, ATM Layer, ATM Adaptation Layer, ATM Physical interface, Choosing an Appropriate ATM Public Service	8	17
3	**Packet Switching Protocols** Introduction to Packet Switching, Virtual Circuit Packet Switching, X.25, switched multimegabit data service	5	11
4	**Protocols and Interfaces in Upper Layers of TCP/IP** Introducing TCP/IP suite, Explaining Network Layer Protocols, Transport Layer Protocol, Application Layer Protocol	4	8
5	**Routing in the Internet** Introduction to Intra-domain and inter-domain routings, Unicast Routing Protocols, Multicast Routing Protocols **Routing Techniques:** IP over ATM, Multiprotocol Label Switching	5	10
6	**Network Management and Services** Remote monitoring Techniques: Polling, Traps, Performance management, Security management, Firewalls, VLANs, Proxy Servers	4	8
7	**Traffic Engineering Basics** Traffic Engineering, Requirement Definition for Traffic Engineering, Traffic Sizing, Traffic Characteristics, Protocols, Time and Delay Consideration, Connectivity	6	13
8	**Introduction to the Cisco IOS.** The Cisco Router User Interface, Command Line Interface (CLI), Router and Switch Administrative Functions, Router Interfaces, Viewing, Saving, and Erasing Configurations.	3	6
9	**IP Routing.** Routing Basics, The IP Routing Process Configuration IP Routing in Our Network	3	6
10	**Dynamic Routing Protocols.** Routing Protocol Basics, Routing Information Protocol (RIP), Interior Gateway Routing Protocol (IGRP), Verifying Your Configurations	4	8
	Total	48	100

Instructional Method and Pedagogy:

- At the start of course, significance of the course, content delivery pattern, and other required details regarding 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 will be reflected in **Continuous Internal Assessment (CIA)** component in the examination scheme of the course.
- Assignments based on the course content will be given to the students and will be evaluated at regular interval evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures. **Practicals** shall be performed in the laboratory related to course contents.

Learning Outcome:

On successful completion of this course, the student should be able to:

- Understand the state-of-the-art in network protocols, architectures and applications
- Understand how networking research is done.
- investigate novel ideas in the area
- Understand the gravity and concepts of computer networks
- Identify basic protocols and design issues for layered model.
- Explain various topological and routing strategies for IP based networks.
- Knowledge of data packet trafficking and its solutions.

e-Resources:

1. https://www.netacad.com/about-networking-academy/packet-tracer/
2. http://gtu-info.com/Subject/180704/ACN/Advance_Computer_Networks
3. https://www.netacad.com/about-networking-academy/packet-tracer/
4. http://www.networkworld.com/blogs
5. https://www.tutorialspoint.com/ipv6/

Reference Books:

1. High Speed Networks and internets, Performance and Quality of Service, William Stallings, Pearson.
2. Advance Computer Network, Dayand Ambawadw, Dr. Deven Shah, Prof Mahendra Mehra, Wiley India.
3. Computer network, Andrew S. Tanenbaum, Pearson.
4. Introduction to Data communication and Networking, Behrouz Forouzan, TMH Publication.
5. TCP/IP Protocol suit ,Behrouz Forouzan , TMH Publication

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List of experiments:

No	Name of Experiment
1	Perform IP exercises, sharing and map network drive on lab systems
2	Introduction to Cisco packet tracer with Implementing any network
3	Create a network with static routing configuration
4	Perform Dynamic routing with protocol
5	To study SONET network configuration and network elements
6	Configuration of ATM Switching
7	Perform VLAN on switches by packet tracer
8	Implement DSL connection with packet tracer
9	Create virtual circuit network frame relay and ATM
10	Configuration of frame relay for CISCO