K. S. INSTITUTE OF TECHNOLOGY

An Autonomous Institution under VTU, Approved by AICTE

Department of Computer Science & Engineering

M.Tech SECOND SEMESTER SYLLABUS

Course : Advances in Computer Networks		Semester	II
Course Code	**25MSCS202**	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	3:1:0	SEE Marks	50
Total Hours of Pedagogy	50	Total Marks	100
Credits	04	Exam Hours	03
Examination type (SEE)	**Theory**		

Course Objectives (Course Skill Set)

- Students will be able to explain various network protocols of their respective layers.

Module-1

Foundation: Building a Network, Requirements, Perspectives, Scalable Connectivity, Cost-Effective Resource sharing, Support for Common Services, Manageability, Protocol layering, Performance, Bandwidth and Latency, Delay X Bandwidth Product, Perspectives on Connecting, Classes of Links, Reliable Transmission, Stop-and-Wait , Sliding Window, Concurrent Logical Channels.

Module-2

Internetworking I: Switching and Bridging, Datagram's, Virtual Circuit Switching, Source Routing, Bridges and LAN Switches, Basic Internetworking (IP), What is an Internetwork?, Service Model, Global Addresses, Datagram Forwarding in IP, sub netting and classless Addressing, Address Translation (ARP), Host Configuration (DHCP), Error Reporting (ICMP), Virtual Networks and Tunnels.

Module-3

Internetworking- II: Network as a Graph, Distance Vector (RIP), Link State (OSPF), Metrics, The Global Internet, Routing Areas, Routing among Autonomous systems (BGP), IP Version 6 (IPv6), Mobility and Mobile IP.

Module-4

End-to-End Protocols: Simple Demultiplexer (UDP), Reliable Byte Stream(TCP), End-to-End Issues, Segment Format, Connecting Establishment and Termination, Sliding Window Revisited, Triggering Transmission, Adaptive Retransmission, Record Boundaries, TCP Extensions, Queuing Disciplines, FIFO, Fair Queuing, TCP Congestion Control, Additive Increase/ Multiplicative Decrease, Slow Start, Fast Retransmit and Fast Recovery

Module-5

Congestion Control and Resource Allocation Congestion-Avoidance Mechanisms, DEC bit, Random Early Detection (RED), Source-Based Congestion Avoidance. The Domain Name System (DNS), Electronic Mail (SMTP,POP,IMAP,MIME), World Wide Web (HTTP), Network Management (SNMP)

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

1. Three Unit Tests each of **25 Marks**
2. Two assignments each of **25 Marks** or **one Skill Development Activity of 25 marks** to attain the COs and POs

The sum of three tests, two assignments/skill Development Activities, will be **scaled down to 50 marks.**

CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester End Examination:

1. The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
2. The question paper consists of Part A and Part B. Part A consists of 10 questions from 5 modules, each carrying 2 marks.
3. Part B consists of 10 questions. Each full question is for 16 marks. There will be two full questions (with a maximum of three sub-questions) from each module.
4. Each full question will have a sub-question covering all the topics under a module.
5. The students will have to answer five full questions, selecting one full question from each module.

Suggested Learning Resources:

Text Books:

- Computer Networks: A System Approach, Larry Peterson and Bruce S Davis, Elsevier, 5th Edition 2014
- Internetworking with TCP/IP, Principles, Protocols and Architecture, Douglas E Comer, PHI, 6th Edition 2014.

Reference Books:

- Computer Networks, Protocols, Standards and Interfaces, Uyless Black , PHI, 2nd Edition

TCP /IP Protocol Suite, Behrouz A Forouzan, Tata McGraw-Hill, 4 th Edition.

Web links and Video Lectures (e-Resources):

- https://www.udemy.com/course/computer-networks-for-beginners-from-zero-to-hero/
- https://www.youtube.com/watch?v=f5ksLu5Xjnk&list=PLG9aCp4uE-s3Mmbn4q5J87OrilN3CuFDS
- https://sites.google.com/site/computernetworksfall2009/course-outline

Skill Development Activities Suggested:

The students with the help of the course teacher can take up relevant technical – activities which will enhance their skill.

Course outcome (Course Skill Set):

At the end of the course the student will be able to :

Sl. No.	Description	Blooms Level
CO1	Identify the vulnerabilities in any computing system and hence be able to design a security solution.	L2
CO2	Identify the security issues in the network and resolve it.	L2
CO3	Analyze security mechanisms using rigorous approaches, including theoretical.	L2
CO4	Apply various protocols for network security to protect against the threats in the networks	L3

Program Outcome of this course:

Sl. No.	Description	POs
1	**Engineering Knowledge:** Apply knowledge of mathematics, science, engineering fundamentals, and a specialization to the solution of complex engineering problems.	PO1
2	**Problem Analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles.	PO2
3	**Design/Development of Solutions:** Design solutions for complex engineering problems and design system components that meet specified needs with consideration for public health and safety, cultural, societal, and environmental concerns.	PO3
4	**Conduct Investigations of Complex Problems:** Use research-based knowledge and methods including design of experiments, analysis, and interpretation of data, and synthesis of information to provide valid conclusions.	PO4
5	**Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools to complex engineering activities with an understanding of limitations.	PO5
6	**Engineer and Society / Project Management & Finance:** Demonstrate knowledge and understanding of engineering and management principles to manage projects, as well as societal, health, safety, legal, and cultural issues.	PO6

Mapping of COs and POs

	PO1	PO2	PO3	PO4	PO5	PO6
CO1		x		x		
CO2		x				x
CO3		x		x		
CO4			x			