RV Educational Institutions ®
RV College of Engineering ®

Autonomous
Institution Affiliated
to Visvesvaraya
Technological
University, Belagavi

Approved by AICTE,
New Delhi

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Semester: IV					
COMPUTER NETWORKS **Category: PROFESSIONAL CORE COURSE** **(Theory)** **(Common to CS, IS, CD, AI & CY)**					
Course Code	:	CY245AT		**CIE**	:	100 Marks
Credits: L:T:P	:	3:0:0		**SEE**	:	100 Marks
Total Hours	:	45L		**SEE Duration**	:	3 Hours

Unit-I	**10Hrs**
Introduction-Perspectives **Business Domains:** Networks. **Applications**: Resource Sharing, Client Server programming, e-commerce and digital communications. Introduction: Networks, Network types. Network Models: TCP / IP protocol suite, Addressing, The OSI Model. Transmission Modes: Parallel Transmission and Serial Transmission. Link Layer: Data Link Control(DLC): DLC Services, Data Link Layer Protocols, High Level Data Link Control (HDLC), Point-to-Point Protocol (PPP): Framing, Transition phases. Media Access Control (MAC): Random Access: CSMA/CD,CSMA/CA.	

Unit – II	**09Hrs**
Network layer design issues: Store and Forward packet Switching, Services Provided to the Transport Layer Implementation of Connectionless Service, Implementation of Connection Oriented Service, Comparison of Virtual Circuit and Datagram Subnets; Routing algorithms: Shortest Path Routing, Flooding, Distance Vector Routing, Link state Routing, Hierarchical Routing Broadcast Routing, and Multicast Routing.	

Unit –III	**08 Hrs**
Congestion Control Algorithms: General Principles of Congestion Control, Congestion Prevention Policies, Congestion Control in Virtual-Circuit Subnets, Congestion Control in Datagram Subnets, Load Shedding, Jitter Control; Quality Of Service: Requirements, Techniques for Achieving Good Quality of Service Integrated Services Differentiated Services.	

Unit –IV	**09 Hrs**
Internetworking: How networks differ, How networks can be connected Connectionless Internetworking, Tunnelling, Internetwork Routing, Fragmentation. **The Network Layer in the Internet**: The IP Protocol, IP Addresses, Internet Control Protocols, OSPF-Interior Gateway Routing Protocol, BGP- Exterior Gateway Routing Protocol, IPv6.	

Unit-V	**09Hrs**
The Internet Transport Protocols: Introduction to UDP, Introduction to TCP. The TCP Service Model. **The TCP Protocol:** TCP protocol, TCP Segment Header, TCP Connection Establishment, TCP Connection Release. TCP Transmission Policy, TCP Congestion Control, TCP Timer Management. **Application Layer:** World Wide web and HTTP, Telnet.	

Course Outcomes: After completing the course, the students will be able to:-	
CO1	Apply the algorithms/techniques of routing and congestion control to solve problems related to Computer Networks.
CO2	Analyse the services provided by various layers of TCP/IP model to build effective solutions.
CO3	Design sustainable networking solutions with societal and environmental concerns by engaging in lifelonglearning for emerging technology.
CO4	Exhibit network configuration, protocol usage and performance evaluation in networks.
CO5	Demonstratethe solutions using various algorithms/protocols available to address networking issues usingmodern tools by exhibiting team work and effective communication.

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Reference Books	
1.	Data Communications and Networking, Behrouz A Forouzan, 5th Edition, 2013, Tata McGraw-Hill, ISBN –9781259064753.
2.	Computer Networks, Andrew S Tanenbaum, 5th Edition, 2014, Pearson Education; ISBN– 978-81-7758-165-2.
3.	Computer Networking, A Top-Down Approach, James Kurose and Keith Ross, 6th Edition, 2013, ISBN-13: 978-0-13-285620-1.
4.	Data and Computer Communications, William Stallings, 8th Edition, 2009, Pearson Education, ISBN-13: 978-0131392052.

EXPERIENTIAL LEARNING

To work on Problems similar to following aspects of Networks: Modern Networking tools usage to solve problems inNetworking (Path Characterization & Bandwidth Estimation, AnalysingReal-time information about the globalrouting system, Measure latency and packet loss reason in wired and wireless network). Online data Privacy,Host/Network Intrusion detection, Detection of potential DDoS attacks, Network analysis to monitor Ethernet andWLAN traffic in real time, IP Spoofing, TCP Off path attacks, Privacy Preserving network log data, wirelessSecurity).

RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)		
#	COMPONENTS	MARKS
1.	**QUIZZES:** Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. **THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.**	**20**
2.	**TESTS:** Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). TWO tests will be conducted. Each test will be evaluated for 50 Marks, adding upto 100 Marks. **FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.**	**40**
3.	**EXPERIENTIAL LEARNING:** Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (20) **Phase 2 will be done in the exhibition mode (Demo/Prototype/any outcome). ADDING UPTO 40 MARKS**.	**40**
	MAXIMUM MARKS FOR THE CIE THEORY	**100**

RUBRIC FOR SEMESTER END EXAMINATION (THEORY)		
Q. NO.	CONTENTS	MARKS
PART A		
1	Objective type questions covering entire syllabus	20
PART B (Maximum of TWO Sub-divisions only)		
2	Unit 1 : (Compulsory)	16
3 & 4	Unit 2 : Question 3 or 4	16
5 & 6	Unit 3 : Question 5 or 6	16
7 & 8	Unit 4 : Question 7 or 8	16
9 & 10	Unit 5: Question 9 or 10	16
	TOTAL	**100**