

FUTURE VISION BIE

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Future Vision

By K B Hemanth Raj

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COMPUTER NETWORKS LAB B.E., VI Semester, Electronics & Communication Engineering [As per Choice Based Credit System (CBCS) Scheme]			
Course Code	17ECL68	CIE Marks	40
Number of Lecture Hours/Week	01Hr Tutorial (Instructions) + 02 Hours Laboratory = 03	SEE Marks	60
RBT Levels	L1, L2, L3	Exam Hours	03
CREDITS – 02			
Course objectives: This course will enable students to: <ul style="list-style-type: none"> Choose suitable tools to model a network and understand the protocols at various OSI reference levels. Design a suitable network and simulate using a Network simulator tool. Simulate the networking concepts and protocols using C/C++ programming. Model the networks for different configurations and analyze the results. 			
Laboratory Experiments			
PART-A: Simulation experiments using NS2/ NS3/ OPNET/ NCTUNS/ NetSim/ QualNet or any other equivalent tool			
<ol style="list-style-type: none"> Implement a point to point network with four nodes and duplex links between them. Analyze the network performance by setting the queue size and varying the bandwidth. Implement a four node point to point network with links n0-n2, n1-n2 and n2-n3. Apply TCP agent between n0-n3 and UDP between n1-n3. Apply relevant applications over TCP and UDP agents changing the parameter and determine the number of packets sent by TCP/UDP. Implement Ethernet LAN using n (6-10) nodes. Compare the throughput by changing the error rate and data rate. Implement Ethernet LAN using n nodes and assign multiple traffic to the nodes and obtain congestion window for different sources/ destinations. Implement ESS with transmission nodes in Wireless LAN and obtain the performance parameters. Implementation of Link state routing algorithm. 			
PART-B: Implement the following in C/C++			
<ol style="list-style-type: none"> Write a program for a HDLC frame to perform the following. <ol style="list-style-type: none"> Bit stuffing Character stuffing. Write a program for distance vector algorithm to find suitable path for transmission. 			

3. Implement Dijkstra's algorithm to compute the shortest routing path.
4. For the given data, use CRC-CCITT polynomial to obtain CRC code. Verify the program for the cases
 - a. Without error
 - b. With error
5. Implementation of Stop and Wait Protocol and Sliding Window Protocol
6. Write a program for congestion control using leaky bucket algorithm.

Course outcomes: On the completion of this laboratory course, the students will be able to:

- Use the network simulator for learning and practice of networking algorithms.
- Illustrate the operations of network protocols and algorithms using C programming.
- Simulate the network with different configurations to measure the performance parameters.
- Implement the data link and routing protocols using C programming.

Conduct of Practical Examination:

- All laboratory experiments are to be included for practical examination.
- For examination one question from software and one question from hardware or only one hardware experiments based on the complexity to be set.
- Students are allowed to pick one experiment from the lot.
- Strictly follow the instructions as printed on the cover page of answer script for breakup of marks.
- Change of experiment is allowed only once and Marks allotted to the procedure part to be made zero.