

10M11CI112: Advanced Computer Networks

Course Credit: 3

Semester: VII

Introduction

This module aims to provide a broad coverage of some new advanced Topics in the field of computer networks (wireless networks, mobile networks, VPN networks, Mobile IP, etc.)

Course Objectives (Post-conditions)

Knowledge objectives:

1. Broaden the knowledge about Layered communication architecture: layers, services, protocols, layer entities, service access points, protocol functions...
2. Mathematical Foundation and Implementation feasibility for different Advanced Routing algorithms
3. Mathematical Foundation and Implementation feasibility for different Advanced Network Congestion Control algorithms
4. Understanding and analyzing different Quality of service (QoS) Parameters
5. Real Time Transport Protocol and its performance with QoS Issues
6. Internetworking and its performance and QoS enhancement Possibilities
7. Performance Issues and their analysis
8. VPN networks
9. Wireless Networks and Mobile Networks: LAN, PAN, Sensor Networks, Ad_hoc Networks
10. Mobile IP, Mobile TCP, IP Security

Application objectives:

1. to develop, implement, and debug Computer Network by NS2 program that meet stated specifications.
2. to develop, implement, and demonstrate the learning through a project that meet stated specifications.
3. to understand and be able to explain various facts about different facts about performance and QoS of computer network.
4. to understand how to maintain the efficiency of various components of the designed or simulated computer networks.

Expected Student Background (Preconditions)

Computer networks

Topics Outline:

S NO	Topics	Hrs
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1	Broaden the knowledge about Layered communication architecture: layers, services, protocols, layer entities, service access points, protocol functions...	2
2	Mathematical Foundation and Implementation feasibility for different Advanced Routing algorithms	4
3	Mathematical Foundation and Implementation feasibility for different Advanced Network Congestion Control algorithms	4
4	Understanding and analyzing different Quality of service (QoS) Parameters	6
5	Real Time Transport Protocol and its performance with QoS Issues	6
6	Internetworking and its performance and QoS enhancement Possibilities	5
7	Performance Issues and their analysis	4
8	VPN networks	4
9	Wireless Networks and Mobile Networks: LAN, PAN, Sensor Networks, Ad_hoc Networks	4
10	Mobile IP, Mobile TCP, IP Security	3
	Total	42

References

1. Andrew S. Tanenbaum, Computer Networks, 4th Edition PHI.
2. B.A. Fourozan, TCP/IP Protocol Suite, 3rd Edition, Singapore, McGrawHill, 2004.
3. William Stallings, Data and Computer Communications, Seventh Edition, Prentice Hall of India Publication.
4. B.A. Fourozan, Data Communications and Networking, 4th Edition, Singapore, McGrawHill, 2004.
5. William Stallings, Computer Networking with Internet Protocol and Technology, Pearson Education.
6. Gerd Keiser, Local Area Networks, 2nd Edition, Tata McGraw-Hill Publishing Company Limited.
7. D. Bertsekas and R. Gallager, Data Networks, Englewood Cliffs, NJ, Prentice-Hall, 1992.
8. Ivo Adan and Jacques Resing, Queueing Theory, Department of Mathematics and Computing Science Eindhoven University of Technology, The Netherlands, February 28, 2002.
9. Sanjay K. Bose, An Introduction to Queuing System, Springer 2002.
10. Prakash C. Gupta, Data Communications and Computer Networks, PHI (2006).

Evaluation Scheme:

S.No	Examination	Marks
1	T-1	15
2	T-2	25
3	T-3	35
4	*Internal Marks	25

*Internal Marks Breakdown:

Assignments 9 marks (3x3)

Quizzes 12 marks (3x4)

Regularity 4 Marks