Faculty in-charge	Dr. Geetha.V and Ms.Thanmayee		
Course Code:	IT200	Course Name:	Computer Communication and Networking
Core/Elective/MLC:	Core	L-T-P:	(4-0-0) 4
Pre-requisites:		Contact Hours:	4 per week - Lecture
Type of course: (Lecture/Tutorial/Seminar/Project)	Lecture	Course Assessment Methods: (both continuous and semester-end assessment)	Theory: (100%) 25% Test, Quiz/Assignment 25% Midsem Exam 50% Endsem Exam

Course Description:

This course introduces the concepts of data communication and Computer networks. It mainly focuses on theory and design aspects of data communication and computer network and performance issues. In data communication, the focus is on the concept of modulation and demodulation techniques for analog and digital signals and bit and burst error detection and correction techniques

Objectives:

The main objective of the course is to learn the protocols of computer network. Focus is given on the concept of networking and performance comparison.

After completion of the course the students will be able to

- Identify basic protocols of Computer network
- Compare protocols for performance analysis
- Explain the working of existing protocols in network layers.
- Explain the working of modulation and demodulation techniques, encoding, flow control and error handling.

Aim: On completing this course the students should have acquired the following Capabilities:

CO1. To explain the functionality of each layer in the OSI and TCP/IP network model.

CO2. To know the working of the application layer and design and develop small applications

CO3. To explain the concept of TCP and UDP, congestion control in Transport layer

CO4. To explain the concepts of IP addressing and designing and solving issues related to routing in Network layer

CO5. To explain and solve problems related data communication: Modulation/demodulation, encoding, framing, flow control and error handling in physical and MAC layer.

Course Plan

Theory:

Week	Topics to be covered
1	Introduction to computer networks, Network architecture - Layering and Protocols, OSI architecture, TCP/IP architecture, Performance
2	Application layer Protocols - Email, WWW, DNS, SNMP, Multimedia
3	Transport layer -Protocols (UDP,TCP) Congestion control and resource allocation

4-5	Internetworking - IP, Routing, Internet, Multicast
6	Bridges and LAN switches, cell switching, Packet Switching
7	Data link control and protocols - Error Detection : Parity, internet checksum, CRC
8	Ethernet, rings, Wireless , Medium Access Control Protocols
9-10	Concept of data communication, Hardware building blocks, Encoding (NRZ, NRZI, Manchester, 4B/5B) Framing: Byte oriented protocols (PPP), Bit oriented Protocols (HDLC), clock based Framing(SONET)

Text Books and/or Reference Books:

1. *Behrouz A Forouzan - Data communications and Networking, 4th Edition, Tata McGraw Hill, 2017*
2. *Larry. L Peterson and Bruce S. Davie - Computer Networks - A systems Approach, 5th Edition, Morgan Kaufmann, 2011.*
3. *Andrew S. Tanenbaum and David J Wetherwall - Computer Networks, 5th Edition,Pearson, 2013*
4. *William Stallings – Data and Computer Communication, 10th Edition, Pearson, 2013*
5. *Leon Gracia and Widjaja – Communication Networks, 2nd Edition, McGraw-Hill, 2003*
6. *James Kurose, Keith Ross – Computer Networking: A Top-Down Approach, 7th Edition, Pearson, 2016*
7. *NPTEL - Data Communication course : https://nptel.ac.in/courses/106105082/*
8. *Coursera – Bits and Bytes of Computer Networking : https://www.coursera.org/learn/computer-networking*
9. *SWAYAM – Computer Networks : https://swayam.gov.in/nd2_cec19_cs07/preview*

ASSESSING THE ATTAINMENT OF COURSE OUTCOMES (CO) FOR THE COURSE

1. Evaluation:

25% Test, Quiz/Assignment
25% Midsem Theory Exam
50% Endsem Theory Exam

2. Assessment CO matrix

Assessment Type	Course Outcomes (CO)				
	CO1	CO2	CO3	CO4	CO5
Test, Quiz	X	X			
Mid Sem Theory Exam(MT)	X	X	X		
End Sem Theory Exam(ET)			X	X	X

Faculty in-charge	Dr. Geetha.V and Ms.Thanmayee		
Course Code:	IT205	Course Name:	Computer Networking Lab
Core/Elective/MLC:	Core	L-T-P:	(0-0-3) 2
Pre-requisites:		Contact Hours:	3 hours lab
Type of course: (Lecture/Tutorial/Seminar/Project)	Lab	Course Assessment Methods: (both continuous and semester-end assessment)	10% Regular lab continuation evaluation 25% Lab Exam 25% Simulation design of Network 40% Lab mini Project - Proposal/Mid Evaluation (10%), End eval(30%)

Course Description:

This course provides handson experience on comupter network concepts, through simulators, socket programming and raw socket programming and minor project.

Objectives:

The main objective of the course is to learn the protocols of computer network with respect to its design. It also focus on designing a network.

After completion of the course the students will be able to
- To explain working of basic protocols of Computer network
- Compare protocols for performance analysis
- Explain the working of existing protocols in network layers.

Aim: On completing this course the students should have acquired the following Capabilities:

CO1. To explain the working of application layer protocols

CO2. To design a small/Medium network with resource and cost optimization

CO3. To explain the concepts of IP addressing and designing and solving issues related to routing in Network layer

CO4. TO explain and utilize sockets or raw sockets for application development

Course Plan
Theory:

Week	Topics to be covered
1	Introduction to ifconfig, and commands to get details on DNS, DHCP, PING
2	Lab exercise on application layer protocols : Email, HTTP, WWW, FTP

3	Packet tracer: Study of Hubs and switches
4	Packet Tracer: Study of Routers
5	Packet Tracer: Study of DHCP, DNS, HTTP, HTTPS, Email
6	Client server application development using sockets
7	Application Development using Sockets
8	Raw sockets for communication
9	Minor Project Implementation
10	Minor Project Implementation
11	Minor Project Implementation

Text Books and/or Reference Books:

1. *Behrouz A Forouzan - Data communications and Networking, 4th Edition, Tata McGraw Hill, 2017*
2. *Larry. L Peterson and Bruce S. Davie - Computer Networks - A systems Approach, 5th Edition, Morgan Kaufmann, 2011.*
3. *Andrew S. Tanenbaum and David J Wetherwall - Computer Networks, 5th Edition, Pearson, 2013*
4. *William Stallings – Data and Computer Communication, 10th Edition, Pearson, 2013*
5. *Leon Gracia and Widjaja – Communication Networks, 2nd Edition, McGraw-Hill, 2003*
6. *James Kurose, Keith Ross – Computer Networking: A Top-Down Approach, 7th Edition, Pearson, 2016*
7. *Computer Networks virtual labs by IITB URL: vlabs.iitb.ac.in/vlabs-dev/labs_local/computer-networks/labs/explist.php*

1. Evaluation:

10% Regular lab continuation evaluation
25% Lab Exam
25% Simulation design of Network
40% Lab mini Project - Proposal/Mid Evaluation (10%), End eval(30%)

2. Assessment CO matrix

Assessment Type	CO1	CO2	CO3	CO4
Regular lab	X	X	X	X
Lab Exam				X
Simulation design of network		X	X	X
Lab mini project			X	X