UNIT I.

The OSI Model and TCP/IP Protocol Suite

Protocols and standards, The OSI Model, TCP/IP Protocol Suite, Addressing, TCP/IP Versions

Link Layer

ARP –Packet format, Encapsulation, Operation, ARP over ATM, Proxy ARP, ARP Package-Cache Table, Queues, I/O Module, Cache-Control module. RARP-Packet format, Encapsulation, RARP Server, Alternative solutions to RARP.

UNIT II.

ICMP & IP

ICMP overview, Message Types, ICMP Message format.CIDR – Subnetting, VLSM, Supernetting. IP Routing Principles, Routing IP Datagrams, Dynamic Routing Protocols – RIP, OSPF, HELLO, BGP. PING program. Traceroute program.

UNIT III

UDP & TCP

UDP-Process to Process Communication, User datagram, Checksum, Operation, Use of UDP, UDP Package, TCP-Services, Features, Segment, TCP connection, State Transition Diagram, Flow-Control-Nagel's Algorithm, Clark's Solution, Error-Control, Congestion Control, TCP Timers-RTT, Karn's Algorithm, Options, TCP Package.

UNIT IV

UDP & TCP Utilities

DNS – Basics, Resolution, Caching, DNS Message Format, Inverse mapping, Pointer Queries.

TELNET – concept, NVT character set, Embedding, Options, Negotiation, controlling the server, Out-Of-Band Signaling, Escape Characters, Mode of Operation, User Interface, Security Issue.

FTP – Connections, Communication, Command Processing, File Transfer, Anonymous FTP.

TFTP – Messages, Connection, Data transfer, UDP ports, TFTP example, Security, Applications. *SMTP* – Architecture, User Agent, Message Transfer Agent, Message Access Agent: POP and IMAP, Web-based mail. SNMP – SMI, MIB, SNMP.

UNIT V

IP over ATM, Mobile IP and VOIP

IP over ATM-ATM WANs-Layers, Carrying a datagram in cells, Routing the cells, *ATMARP, Logical IP Subnet (LIS).*

VOIP – Session Initiation Protocol, H.323 architecture and protocols.

Mobile IP – Addressing, Agents, Three Phases Inefficiency in mobile IP.

Text Book:

1. Behrouz A. Forouzan, "TCP/IP Protocol Suite", Tata Mc-Graw-Hill publications, 3rd Edition, 2006.

Books for Reference:

- Comer E. Douglas, "Internetworking with TCP/IP Principles, Protocols and Architectures", Volume 1, Pearson Education, 4th Edition, 2002.
- Siyan S Karanjit and Parker Tim, "TCP/IP Unleashed", Pearson Education Asia, 3rd Edition.

SEMESTER – I			
Core Practical - I J2EE Lab			
Code : 19PCSCR1	**Hrs / Week : 4**	**Hrs / Sem : 60**	**Credits : 2**

1. Write a Servlet to display “Hello World” on browser.
2. Write a Servlet to display all the headers available from request.
3. Write a Servlet to display parameters available on request
4. Write a Servlet to display all the attributes available from request and context
5. Write a Servlet which displays a message and also displays how many times the message has been displayed (how many times the page has been visited).
6. Assume that the information regarding the marks for all the subjects of a student in the last exam are available in a database, Develop a Servlet which takes the enrollment number of a student as a request parameter and displays the marksheet for the student.
7. Develop a Servlet which looks for cookies for username and password, and forwards to a home.jsp in case the cookies are valid and forwards to login.jsp, in case the cookies are not found or the cookies are not valid.
8. Develop a Servlet to authenticate a user, where the loginid and password are available as request parameters. In case the authentication is successful, it should setup a new session and store the user's information in the session before forwarding to home.jsp, which displays the user's information like full name, address, etc.
9. Write a simple JSP page to display a simple message (It may be a simple html page).
10. Write a JSP page, which uses the include directive to show its header and footer.
11. Create a Java class called Product with the following properties: name, description, price. Create a listener that notifies (through System.out) whenever a user adds a product to a shopping cart (i.e. adds an object to the session object) or removes it again. Hint: check out the class HttpSessionAttributeListener. Make it print the name and price of the object (hint: access the session through the HttpBindingEvent object). Also, let the listener print the total price of all objects saved in the session so far (one way to accomplish this could be to keep a collection of all objects saved to the session – or just their keys – in the listener or an associated class).
12. Create a servlet filter that logs all access to and from servlets in an application and prints the following to System.out: a. the time the request was received b. the time the response was sent c. how much time it took to process the request d. the URL of the resource requested e. the IP address of the visitor
13. Develop a interest calculation application in which user will provide all FACULTY OF COMPUTER APPLICATIONS information in HTML form and that will be processed by servlet and response will be generated back to the user.
14. Develop an application to demonstrate how the client (browser) can remember the last time it visited a page and displays the duration of time since its last visit. (Hint: use Cookie)
15. Develop an application to keep track of one user across several servlet invocations within the same browser session.

SEMESTER- II			
Core Practical IV – Network Simulation Lab I			
Code: 19PCSCR4	**Hrs / week :4**	**Hrs / Sem: 60**	**Credits :2**

1. Implementation of File System Calls
2. Implementation of ICP Techniques – Pipe, Message Queue, Shared Memory
3. Socket Programming
    a) TCP Sockets
    b) UDP Sockets
    c) Applications using Sockets
4. Simulation of Sliding Window Protocol
5. Simulation of Routing Protocols
6. RPC
7. Development of applications such as DNS / HTTP / E-mail / Multi-user chat