IT- 501 – Data Communication

Unit I
Data and signal-Analog and digital signals, Time and frequency domain, Composite signals, - Bandwidth, bit rate, bit length, Baseband and broadband transmission, Attenuation, distortion, noise,Nyquist bit rate ,Shannon capacity ,Throughout, delay ,Jitter, Bandwidth delay product.

Unit II
Data communication concepts – Data transmission – Parallel and serial transmission, synchronous, and Asynchronous transmission, Simplex,half duplex and fullduplex , unipolar and polar line codes, Non return to zero codes, return to zero codes, bipolar line codes, bauds , modem, Line configurations-Point to point and point to multipoint configuration.

Unit III
Telephone Network-Network topology, signaling- SS7,dial-up modems, modem standard, digital subscriber line – ADSL,SDSL,VDSL .Multiplexing,Frequency division multiplexing, time division multiplexing and wavelength division multiplexing, pulse code modulation, pleisochronous digital hierarchy(PDH), synchronous digital hierarchy (SDH) ,STM -1 frame, virtual container, mapping of data signals on STM- 1.

Unit IV
Switching techniques- Circuit , packet and hybrid switching, Types of error, single bit error, burst error, Error detection , Vertical redundancy check, Longitudinal redundancy check, cyclic redundancy check, error correction, Integrated services digital network, ISDN interface, ISDN devices, reference points ,ISDN services, ISDN Protocols

Unit V
Transmission media-Guided and unguided media, twisted pair ,Unshielded twisted pair and Shielded twisted pair, coaxial cable and fiber optic cable, radio waves, microwaves and infrared transmission RJ- 45,Network interface card, rack, cable standard-Category 5,6,and 7,cross connection, straight connection cable coding standards.

References:-
1. "Data communication and networking", Forouzan, TMH 4 th edition
2. Data communication and Computer Networks, Prakash C Gupta ,PHI Learning
3. "Computer Networks" - Tanenbaum ,PHI Learning.
4. "Communication Networks-Fundamental concepts and key Architectures",
Leon-Garcia,Widjaja, TMH
5. "Computer Communications & Networking Technologies"-Michael A. Gallo &
William M. Hancock -Cengage pearsen publications
6. "Network for computer scientists & engineers" –Youlu zheng & shakil akhtar , Oxford pub.

Suggested List of Experiment
1. Case Study of digital interface RS-232
2. Case Study of Synchronous and asynchronous transmission
3. Case Study of various multiplexing techniques
4. Case Study of Parallel and serial transmission
5. ISDN implementation for internet
6. ISDN Devices
7. Study of SDH
8. Study of Network Interface Card
9. Study of twisted pair,coaxial cable and Fiber optic cable

10. Study of cross cable connection and straight cable connection
11. Study of digital subscriber line-ADSL for broadband connection
12. Study of NRZ and RZ Codes

IT- 502 – Information Storage and Management

Unit-I
Introduction to Storage Technology: Data proliferation, evolution of various storage technologies, Overview of storage infrastructure components, Information Lifecycle Management, Data categorization.

Unit-II
Storage Systems Architecture: Intelligent disk subsystems overview, Contrast of integrated vs. modular arrays, Component architecture of intelligent disk subsystems, Disk physical structure components, properties, performance, and specifications, RAID levels & parity algorithms, hot sparing, Front end to host storage provisioning, mapping and operation.

Unit-III
Introduction to Networked Storage: JBOD, DAS, NAS, SAN & CAS evolution and comparision. Applications, Elements, connectivity, standards, management, security and limitations of DAS, NAS, CAS & SAN.

Unit -IV
Hybrid Storage solutions; Virtualization: Memory, network, server, storage & appliances.
Data center concepts & requirements, Backup & Disaster Recovery: Principles
Managing & Monitoring: Industry management standards (SNMP, SMI-S, CIM), standard framework applications, Key management metrics (Thresholds, availability, capacity, security, performance).

Unit-V
Information storage on cloud :Concept of Cloud, Cloud Computing, storage on Cloud, Cloud Vocabulary, Architectural Framework, Cloud benefits, Cloud computing Evolution, Applications & services on cloud, Cloud service providers and Models, Essential characteristics of cloud computing, Cloud Security and integration.

References:
1. G. Somasundaram & Alok Shrivastava (EMC Education Services) editors; Information Storage and   Management: Storing, Managing, and Protecting Digital Information; Wiley India.
2. Ulf Troppens, Wolfgang Mueller-Friedt, Rainer Erkens, Rainer Wolafka, Nils Haustein; Storage   Network explained : Basic and application of fiber channels, SAN, NAS, iSESI, INFINIBAND and FCOE, Wiley India.
3. John W. Rittinghouse and James F. Ransome; Cloud Computing : Implementation , Management and Security, CRC Press, Taylor Frances Pub.
4. Nick Antonopoulos, Lee Gillam; Cloud Computing : Principles, System & Application, Springer.
5. Anthony T. Velete, Toby J.Velk, and Robert Eltenpeter, Cloud Computing : A practical Approach, TMH Pub.
6. Saurabh , Cloud Computing : Insight into New Era Infrastructure, Wiley India.
7. Sosinsky, Cloud Computing Bible, Wiley India.
8. Rich Schiesser, IT Systems Management :Designing, Implementing and Managing World-class Infrastructures, PHI Learning

IT- 503 – Computer Networks

Unit I
Importance of computer networks, broadcast and point to point networks, Local area networks and Wide area networks , Introduction to ISO-OSI reference model, TCP/IP reference model , function of each layer, interfaces and services, Protocol data unit, connection oriented and connectionless services, service primitives, comparison of TCP/IP and ISO-OSI reference model, Novel Netware, Arpanet , X.25

Unit II
Data-Link layer: - Data link layer design issues, framing , flow & error control , physical addressing,Stop & Wait protocol ,Go back N ARQ ,selective repeat ARQ ,piggybacking and pipelining ,HDLC LAN Protocol stack-Logical link control and Media Access Control sublayer, IEEE 802.2 LLC Frame format Data link layer in the internet, Serial line IP and Pont to point protocol

Unit III
MAC layer Protocols- , static and dynamic allocation , Pure and slotted ALOHA protocols, Carrier sense multiple access, Persistent and non persistent CSMA, IEEE standard 802.3 and Ethernet,802.3 cabling, IEEE 802.4, IEEE 802.5, FDDI Wireless LAN , Comparison of wired and wireless LAN, WIMAX

Unit IV
The Network layer- logical addressing, classful & classless addressing , address mapping ,packet delivery & forwarding. unicast routing protocols , multicast routing protocols, Routing algorithm- Least Cost, Dijkstra's, Bellman-ford, congestion control algorithms, Internetworking devices, Introduction to Internet protocol IPv4

Unit V
Transport layer-Transport services , Process to process delivery, UDP ,TCP ,congestion control , quality of service , Integrated services, Differentiated services
LAN-WAN Design and implementation-Configuring TCP/IP, using Ipconfig, ping command , study of structured LAN , study of internetworking devices and their configuration– switches, hubs, Bridges, routers and Gateways

References:-
1. "Local area networks ", Forouzan, TMH, 1st edition
2. "Computer Networks" - Tanenbaum ,PHI Learning.
3. Computer Networks: Protocols, Standards and Interfaces By Black, PHI learning
4. "Computer Communications & Networking Technologies"-Michael A. Gallo &
William M. Hancock -Cengage pearsen publications

Suggested List of Experiment
1. Establishment and configuration of LAN
2. Colour coding standard of CAT 5,6,7 and crimping of cable in RJ-45
3. Study of WAN
4. Case study of STOP AND WAIT Protocols
5. Study of sliding window protocol
6. study of IEEE 802.3 , 802.4 ,802.5
7. Study of FDDI
8. Study of basic networking commands like ping, ipconfig, etc

9. Case study of various Routing Strategies
10. Case studies of various Network Topologies
11. Establishing & studying the various parameters of a home LAN Network
12. Study of IOS of routers
13. Configuring routers, bridges and switches and gateways

IT- 504 – System Programming and operating system

Unit I
Introduction Language Processors, Language Processing Activities and Language Processors Development Tools, Assemblers, Compiler, Macros and Macro Processors, Linkers, Software Tools . Introduction to Operating Systems, Types of operating Systems, system protection, Operating system services.

Unit II
Basic concepts of CPU scheduling, Scheduling criteria, Scheduling algorithms, algorithm evaluation, multiple processor scheduling. Process concept, operations on processes, threads, interprocess communication, precedence graphs, critical section problem, semaphores, classical problems of synchronization,

Unit III
Deadlock problem, deadlock characterization, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock, Methods for deadlock handling. Concepts of memory management, logical and physical address space, swapping, Fixed and Dynamic Partitions, Best-Fit, First-Fit and Worst Fit Allocation, paging, segmentation, and paging combined with segmentation.

Unit IV
Concepts of virtual memory, Cache Memory Organization, demand paging, page replacement algorithms, allocation of frames, thrashing, demand segmentation, Role of Operating System in Security, Security Breaches, System Protection, and Password Managment.

Unit V
Disk scheduling, file concepts, File manager, File organization, access methods, allocation methods, free space managements, directory systems, file protection, file organization & access mechanism, file sharing implement issue, File Management in Linux, introduction to distributed systems.

References:
1. M. Flynn " Operating Systems". Cengage Learning.
2. Silberschatz ,"Operating system", Willey Pub
3. Tanenbaum " Modern Operating System" PHI Learning.
4. Dhamdhere, "System Programming and Operating System",TMH.
5. Stuart,"Operating System Principles, Design & Applications",Cengage Learning
6. Operating System : Principle and Design by Pabitra Pal Choudhury, PHI Learning

Suggested List of Experiment
1. Program to implement FCFS CPU scheduling algorithm.
2. Program to implement SJF CPU scheduling algorithm.
3. Program to implement Priority CPU Scheduling algorithm.
4. Program to implement Round Robin CPU scheduling algorithm.
5. Program to implement classical inter process communication problem(producer consumer).
6. Program to implement classical inter process communication problem(Reader Writers).
7. Program to implement classical inter process communication problem(Dining Philosophers).
8. Program to implement FIFO page replacement algorithm.
9. Program to implement LRU page replacement algorithm

10. Program to implement LFU page replacement.
11. Program to implement Optimal page replacement.

IT- 505 – Java Programming

UNIT-I
The Java Environment: Java Development Kit (JDK) ,Java virtual machine , Java programming environment (compiler, interpreter, appletviewer, debugger), , Java Applications Programming Interface (API), Basic idea of application and applet**.**
Java as an object oriented language:objects, classes, encapsulation, inheritance,and software reuse, polymorphism, abstract classes and abstract methods, : defining an interface, implementing & applying interfaces, variables in interfaces, extending interfaces, Packages,scope and lifetime; Access specifies; Constructors; Copy constructor; this pointer; finalize () method; arrays; Memory allocation and garbage collection

UNIT-II
AWT: Containers and components,AWT classes, window fundamentals:
Component,Container,Panel,Window,Frame,Canvas,AWT Controls,Layout Managers and Menus:adding and removing control,Labels, Button, Check Box, Radio Button, Choice ,menu, Text area, Scroll list, Scroll bar; Frame; Layout managers- flow layout, Grid layout, Border layout, Card layout.
Java Event Handling Model: Java's event delegation model – Ignoring the event, Self contained events, Delegating events; The event class hierarchy; The relationship between interface, methods called, parameters and event source; Adapter classes; Event classes action Event, Adjustment Event, Container Event, Focus Event, Item Event, Eye Event, Mouse Event, Text Event, Window Event.
Applets: Applet security restrictions; the class hierarchy for applets; Life cycle of applet; HTML Tags for applet
Introduction to Swing: swing library, Building applications using Swings

UNIT-III
Multithreading and Exception Handling:
Overview of simple threads, Basic idea of multithreaded programming,Thread synchronization:Locks, synchronized methods, synchronized block, Thread scheduling,Producer-consumer relationship, Daemon thread, Basic idea of exception handling,stack based execution and exception propagation,Exception types:, Exception Handling:Try,Catch,Finally,Throw statement,Assertions

UNIT-IV
Input/Output : Exploring Java I/O., Directories, stream classes The Byte stream : Input stream, output stream, file input stream, file output stream, print stream, Random access file, the character streams, Buffered reader, buffered writer, print writer, serialization.
JDBC: JDBC-ODBC bridge; The connectivity model; The driver manager; Navigating the result set object contents; java.sql Package; The JDBC exception classes; Connecting to Remote database.

UNIT-V
Java Networking : exploring java.net packageNetworking Basics : Socket, Client server, reserved sockets, proxy servers, Internet addressing, TCP sockets, UDP sockets.
RMI:Client/Server architecture, RMI registry services; Steps of creating RMI Application and an example.

REFERENCES:-
1. Naughton & Schildt "The Complete Reference Java 2", Tata McGraw Hill
2. Deitel "Java- How to Program:" Pearson Education, Asia

3. Horstmann & Cornell "Core Java 2" (Vol I & II) , Sun Microsystems
4. Ivan Bayross "Java 2.0" : BPB publications
5. Ivor Horton's "Beginning Java 2, JDK 5 Ed., Wiley India.
6. Java Programming for the absolute beginners By Russell, PHI Learning

IT- 506 – Java Programming (Lab)

Unit I
JDK Installation and setting the path, JDK Tool(Java Compiler, Java Virtual Machine, Debugger, Appletviewer, Javadoc, Jar),Compile and run java program, Compiler options and JVM options, Data type, Operators , Control Statement (if, if…else, switch …case, while, for, do…while, break, continue, labeled break, labeled continue) , Arrays ,Memory allocation and garbage collection,Classes and object scope and life time ,Access specifies, Constructor and finalize method , this keyword, instance block, static block, static data member, static method, Inheritance, method overriding, dynamic method dispatch, constructors in Inheritance ,super keyword, abstract method and abstract class, final method ,final data member, final class, defining an Interface, Implementing and applying interface, extending Interface.

Unit-II
creating package , using package. Try, catch, throw, throws, finally, Object Class,String Class, String Buffer class, Math Class, Wrapper Classes, StringTokenizer Class, Collection, Set, List Map, ArrayList, SortedSet, Iterator, File Class, Thread class and its method, Creating Thread ,lifecycle of a thread, Runnable Interface, thread synchronization, wait, notify, ThreadGroup class.

Unit -III
Command Line Arguments, InputStream , OutputStream,Reader,Writer, ,FileInputStream, FileOutputStream, DataOutputStream, DataInputStream, FileReader, FileWriter, InputStreamReader, BufferedReader ,ObjectOutputStream, ObjectInputStream, Object Serialization.,Scaner , RandomAccessFile.

Unit -IV
Abstract Window toolkit, awt package, Applet, Lifecycle of an Applet, GUI Component (Button, Label, TextField, TextArea, List, Choice, CheckBox), Panel, Event Source, Event handlers, Event classes, Containers, Frame class, Panel ,Dialog , Layout Manager,Swing, swing complonents, JFrame, JApplet,

JPanel, JButton, JLabel, JTable, JTextField,JTextArea,JRadioButton,JCheckBox,JList JTree, Icon, LookAndFeel.,Graphics2D and drawing Image.

Unit-V
Networking basics, Socket, port, Proxy servers, Internet addressing and URL, java.net – networking classes and interfaces, Implementing TCP/IP based Server and Client.
Classes to be covered Socket, ServerSocket, IPAddress, URL connections; Programs on chatting 1-1 & 1-M (Threading),Implementing UDP based Server and Client DatagramPacket and DatagramSocket. Introduction of RMI & Architecture ,Implementing RMI ,Writing RMI Server, Designing Remote Interface, Implementing Remote Interface, Passing Object in RMI, Creatting RMI Client. Types of JDBC Drivers, Writing JDBC applications using select, insert, delete, update; Types of Statement objects (Statement, PreparedStatement and CallableStatement); ResultSet, ResultsetMetaData; Inserting and updating records, Connection Pooling.

Reference Books:-
1. Java 2 Complete Reference (5th Ed), Herbert Schildt, TMH
2. Core Java Volume-I, Horstman and Cornell, Pearson Education
3. Core Java Volume-II, Horstman and Cornell, Pearson Education