BE-401- ENGINEERING MATHEMATICS – II

UNIT I

Concept of Probability: Probability Mass function, Probability density function. Discrete Distribution: Binomial, Poisson's, Continuous Distribution: Normal Distribution, Exponential Distribution, Testing of Hypothesis:-Students t-test, Fisher's z-test, Chi-Square Method.

UNIT II

Functions of complex variables: Analytic functions, Harmonic Conjugate, Cauchy-Riemann Equations, Line Integral, Cauchy's Theorem, Cauchy's Integral Formula, Singular Points, Poles & Residues, Residue Theorem, Application of Residues theorem for evaluation of real integrals.

UNIT III

Introduction of Fourier series: Fourier series for Discontinuous functions, Fourier series for even and odd function, Half range series Fourier Transform: Definition and properties of Fourier. Fourier transform, Sine and Cosine transform.

UNIT IV

Laplace Transform: Introduction of Laplace Transform, Laplace Transform of elementary functions, properties of Laplace Transform, Change of scale property, second shifting property, Laplace transform of the derivative, Inverse Laplace transform & its properties, Convolution theorem, Applications of L.T. to solve the ordinary differential equations.

UNIT V

Vector Calculus: Differentiation of vectors, scalar and vector point function, geometrical meaning of Gradient, unit normal vector and directional derivative, physical interpretation of divergence and Curl. Line integral, surface integral and volume integral, Green's, Stoke's and Gauss divergence theorem.

References:-

1). Higher Engineering Mathematics by B.S. Grewal, Khanna Publication.

2). Engineering mathematics volume II & III by D.K. Jain

3). Engineering mathematics volume II by D.C. Agrawal

CS- 402 –Data Communication

UNIT - I

Introduction : Data Communication, Components , data representation , data flow and basic model , Serial & Parallel transmission , Data transmission modes, Analog & digital transmission methods, Encoding, Unipolar, Polar, Bipolar, Line & Block codes. Data compression and data compression techniques.

UNIT-II

Multiplexing: Frequency Division Multiplexing (FDM)., Time Division Multiplexing (TDM), Statistical Time Division Multiplexing (STDM)**,** Spread spectrum: Frequency Hopping & Direct Sequence. Terminal handling & Polling. Network Switching Techniques: Circuit, Message, Packet & Hybrid. X.25, ISDN.

UNIT-III

Physical Layer: Physical layer characterization, Physical layer Interface and Standards, digital Interface, Connection, specifications & configuration. Modem, Types of Modem, features, signal constellation, block schematic. Network Devices, Active and Passive Hubs, Repeaters, Bridges, Two & Three layer switches & Gateway, Network Topologies.

UNIT-IV

Transmission Media: Transmission line characteristics, distortions, Crosstalk. Guided Media and Unguided media, Electromagnetic polarization , Rays and waves front , Electromagnetic spectrum, Radiation & Propagation of Waves, Inverse square law , Wave attenuation and absorption, Terrestrial Propagation, Skip distance, Radio waves, Microwave, Infrared & Satellite Communication system .

UNIT-V

Data Link Layer: Transmission Errors, Content Error, Flow integrity Error, Error detection & Correction methods, Parity checking, Checksum Error Detection, Cyclic Redundancy Check , Hamming Distance , Interleaved codes , Block Parity, Convolution code, Hardware Implementation, Checksum .

References:

1. Forouzan, “Data communication and Networking”, 5e, TATA Mc Graw
2. Stallings William , “Data & Computer Communication”, Pearson Education
3. Godbole A., “Data Communication & Network” , TMH
4. Miller, “ Data Network and Comunication”, Cengage Delmar Learning

CS-403 - Digital Circuit & System

UNIT-I

Number System & Boolean Algebra: Review of number system; types and conversion, codes. Boolean algebra: De-Morgan's theorem, switching functions and simplification using K-maps & Quine McCluskey method.

UNIT-II

Combinational Circuits: Logic gates, Half and Full adders, Half and Full Substractors Series & parallel addition , BCD adders, Look-ahead carry generator, comparators, code converters, , multiplexers and demultiplexers, Function realization using gates & multiplexers, encoders, decoders

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UNIT-III

Sequential Circuits:-Flip flops : S-R, D, J-K and T Flip Flop, Shift Register, Analysis of synchronous sequential circuits; design of synchronous sequential circuits – Counters, types of counters.

UNIT-IV

Programmable Logic Devices, Memory And Logic Families Memories: ROM, PROM, EPROM, PLA, PLD, FPGA, Logic families : RTL, DTL, All types of TTL circuits , ECL, I2L , PMOS, NMOS & CMOS logic. Multivibrator : Monostable, Bistable, & Astable multivibrator, Schmitt trigger circuits & Schmitt-Nand gates.

UNIT-V

A/D Converter and D/A Converter:-Introduction of Analog to Digital & Digital to Analog converters, sample & hold circuits and V-F converters.

.**References:**

1. M. Mano; "Digital Logic & Computer Design"; PHI.
2. Malvino & Leach; "Digital Principles & Applications"; TMH
3. W.H. Gothman; "Digital Electronics"; PHI.
4. Millman & Taub; "Pulse, Digital & Switching Waveforms"; TMH
5. Jain RP; Modern digital Electronics; TMH
6. R.J. Tocci, "Digital Systems Principles & Applications".

List of Experiments:

1. To study and test of operation of all logic gates for various IC's (IC#7400,IC#7403,IC# 7408, IC#74332,IC#7486).
2. Verification of Demorgan's theorem.
3. To construct of half adder and full adder
4. To construct of half and full subtractor circuits
5. Verification of versatility of NAND & NOR gate.
6. Design a Multiplexer/ Demultiplexer.
7. To demonstrate the operation of RS,JK and D flip-flops.
8. To study 4-bit magnitude compator.
9. To study operation of binary and decade counter

CS- 404 –Data File Structures

UNIT I

Introduction: Data structures, Type of Data structure, ordered lists, operations in ordered list, sparse matrices, , arrays multi - dimensional arrays, linked lists, operations on linked list, doubly linked list and its operations, storage pools, garbage collection.

UNIT II

Stack: Stacks and Its Operations, applications of Stacks and queues and operation of queues, difference between Stacks and queues, Circular queues, Mazing problem, Prefix, postfix, infix notations

UNIT III

Trees: Concept of Trees, Type of Trees, applications of Trees , AVL Trees, B -Trees, binary tree, operations on binary tree , Spanning tree, cut sets, graphs, properties of graph, Planner graphs and its applications, Hamiltonian path and circuits Eularian paths and circuits.

UNIT IV

Sorting & Searching : Sorting, Insertion Sort, Bubble Sort, selection sort Quick Sort, Merge Sort, Heap Sort, Radix sort, Searching & Hashing: Hash Table, Hash Functions, Collision Resolution Strategies, Hash Table Implementation. Symbol Table, Static tree table, Dynamic Tree table.

UNIT V

Sorting & Searching Technique: Sequential Search, Binary Search, Other search techniques, Time complexity & memory requirements, Bubble Sort, Insertion sort, Quick sort, Selection sort, Merge sort, Heap sort, maxima and minima heap.

References:

1. Data Structure by Tanenbaum
2. Data Structure by Horowitz & Sahan

List of Experiments (expandable):

Programs in C relating to different theory units

CS- 405 – Operating System

Unit I

Introduction: History of operating System, Types of Operating System: Batch Processing, Real Time, Multitasking & Multiprogramming, time-sharing system, Operating system services, Operating system structure, System Call & System Boots, Operating system design & Implementations, System protection, Buffering & Spooling.

Unit II

Processes Management: The Process concept, The process control block, Systems programmer's view of processes, Operating system services for process management, Scheduling algorithms, First come first serve, Round Robin, Shortest run time next, Highest response ratio next, Multilevel Feedback Queues, Performance evaluation of scheduling algorithms stated above

Deadlock: Characterization, Methods for deadlock handling, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock, Process Management in Linux.

Unit III

File Management : File system , access methods, free space managements, allocation methods, directory systems, protection, organization ,sharing & implementation issues, Disk & Drum Scheduling, File system in Linux & Windows

I/O Management: I/0 devices organization, I/0 devices organization, I/0 buffering, I/O Hardware, Kernel I/O subsystem, Transforming I/O request to hardware operations.

Device Management : Path managements, Sub module, Procedure, Scheduler, Handler, Interrupt Service Routine.

Unit IV

Memory Management: Memory Hierarchy, MFT & MVT, logical and physical address space, Concept of swapping and Paging, Memory management without swapping or paging, contiguous and non-contiguous allocation, segmentation, , demand paging, page replacement algorithms, allocation of frames, thrashing, demand segmentation and paging combined with segmentation. Structure & implementation of Page table. Virtual memory, Cache Memory Organization.

Unit V

Distributed System:- Concept of Distributed System. Types of Distributed Operating system, Distributed File system, Remote file access, Remote Procedure Call, RMI, Distributed Shared Memory, Basic Concept of Parallel Processing & Concurrent Programming.

Security & threats protection: Security violation through Parameter, Computer Worms & Virus, Security Design Principle, Authentications, Protection Mechanisms, introduction to Sensor network and parallel operating system.

Case study: Unix, Linux & Windows.

List of Experiment

1. Write a program to implement FCFS CPU scheduling algorithm.
2. Write a program to implement SJF CPU scheduling algorithm.
3. Write a program to implement Priority CPU Scheduling algorithm.
4. Write a program to implement Round Robin CPU scheduling algorithm.
5. Write a program to compare various CPU Scheduling Algorithms over different Scheduling Criteria.
6. Write a program to implement classical inter process communication problem(producer consumer).
7. Write a program to implement classical inter process communication problem(Reader Writers).
8. Write a program to implement classical inter process communication problem(Dining_Philosophers).
9. Write a program to implement & Compare various page replacement algorithm.
10. Write a program to implement & Compare various Disk & Drum scheduling Algorithms
11. Write a program to implement Banker's algorithms.
12. Write a program to implement Remote Proccedure Call.
13. Write a Devices Drivers for any Device or pheriperal.

Text Book:

1. Silberschatz ,"Operating system", Willey Pub.
2. Stuart,"Operating System Principles, Design & Applications",Cengage Learning
3. Tannanbaum, "Modern operating system",PHI Learning
4. Dhamdhere, "Operating System",TMH.
5. Achyut S Godbole,"Operating System", TMH.
6. William stalling, "operating system" Pearson Edu.
7. Deitel & Deitel, "Operating Systems", Pearson Edu.
8. Flynn & Mchoes, "Operating Systems", Cengage Learning
9. Haldar, "Operating System", Pearson Edu

CS-406- Java Programming

UNIT-I

The Java Environment: History of Java: Comparison of Java and C++; Java as an object oriented language: Java buzzwords; A simple program, its compilation and execution; the concept of CLASSPATH; Basic idea of application and applet.

Basics: Data types; Operators- precedence and associativity; Type conversion; The decision making – if, if. else, switch; loops – for, while, do…while; special statements–return, break, continue, labeled break, labeled continue; Modular programming methods; arrays; memory allocation and garbage collection in java keywords.

UNIT-II

Object Oriented Programming in Java: Class; Packages; scope and lifetime; Access specifies; Constructors; Copy constructor; this pointer; finalize () method; arrays; Memory allocation and garbage collection in java keywords

UNIT-III

Inheritance : Inheritance basics, method overriding, dynamics method dispatch, abstract classes.

Interfaces : defining an interface, implementing & applying interfaces, variables in interfaces, extending interfaces.

UNIT-IV

Multithreading and Exception Handling: Basic idea of multithreaded programming; The lifecycle of a thread; Creating thread with the thread class and runnable interface; Thread synchronization; Thread scheduling; Producer-consumer relationship; Daemon thread, Selfish threads; Basic idea of exception handling; The try, catch and throw; throws Constructor and finalizers in exception handling; Exception Handling.

UNIT-V

The AWT: The class hierarchy of window fundamentals; The basic user interface components Label, Button, Check Box, Radio Button, Choice menu, Text area, Scroll list, Scroll bar; Frame; Layout managers-flow layout, Grid layout, Border layout, Card layout.

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. lvan Bayross "Java 2.0" : BPB publications