Operating System

Module-1

Functions of OS, Purpose of OS, Architecture & Structures of OS, Types of OS, Process Management, Concurrency, Synchronization and Deadlock, Memory management & Virtual memory, I/ O System1, Disk Scheduling, IPC Mechanism, Difference between Kernel and and OS13 Raid and Raid structure in OS

Module-2

Introduction of windows server 2019, Installation, Active directory introduction, WDS, Server monitoring tools, WSUS, SCCM

Module-3

Monitoring & Maintenance of Network Infrastructure Services-DHCP, DNS, Network Access Protection

Monitoring & Maintenance of Active Directory- Roles, Rights & Permissions, Backup & Recovery, Group policy

Monitoring & Maintenance of print & file servers- File servers, Print servers, DFS, Share point services

Module-4

Terminal service servers, IIS, Windows Server security, Business Continuity and High Availability, Fail Over Clustering, Network Load balancing, Backup & Recovery.

Module-5

Introduction of Linux, Advanced File permissions, Access control lists, Disk and process management, Managing physical storage, managing flexible storage with LVM, RPM, Remote Login services

Linux Server configuration & Management- NFS, FTP, Samba, DNS, DHCP, Apache, Squid, Mail server, LDAP server, ISCSI Target server, Troubleshooting & Debugging, Backup & Recovery, LINUX Security, VPN.

REFERENCES

1. Specifications of Microsoft Windows Server 2008: The Complete Reference (Paperback) ,Author Danielle Ruest,Publisher, Mcgraw-hill Osborne Media.
2. MCITP: 5-in-1 Study System, Windows Server 2008 Enterprise Administrator [Paperback],Kogent Learning Solutions Inc., Publisher: Dreamtech Press; 2011 edition (1 March 2011).MCITP-sybex
3. Linux: The Complete Reference,6th edition,Richard Peterson,Tata McGraw-Hill Education, 2007 .

4. RHCE Red Hat Certified Engineer Linux Study Guide (Exam RH302),Micheal Jang,McGraw-Hill Companies,Incorporated, 2007
5. Red Hat Linux Administrator's Handbook,author Mohammad j.Kabir,Publisher: Wiley; 2 edition .
6. Red Hat Linux Networking and System Administration,Terry collings,kurt Wall

Network Management

Module-1

Internetworking Models, OSI Reference Model, Ethernet networking, Introduction to TCP/IP, TCP/IP and DOD Model, IP addressing, IPV4 Services, Subnetting, VLSM, CIDR.

Module-2

WAN Technologies, Introduction & Configuration of Router, Routing Basics & Principles, Routing Protocols, Static routing, Default routing &Dynamic routing. Network Vulnerabilities

Module-3

ACL- Access Control Lists Fundamentals & Configuration, Types of ACLs, Troubleshooting of ACLs.

 NAT – Introduction, configuration of Static NAT, Dynamic NAT &PAT,VPN

Module-4

Switching- Introduction to switching, Configuration, VLAN Introduction, VLAN Trunking, Inter-VLAN Routing, Spanning-Tree protocol.

Module-5

Introduction & Fundamentals of IPV6, Security Device Manager

Wireless LAN – Fundamentals, Types, Security, Configuration of Wireless router

REFERENCES

1. CCNA Cisco Certified Network Associate: Study Guide (With CD) 7th Edition , Author: Todd Lammle, Publisher: Wiley India Pvt Ltd, 2011, Series Name: SYBEX
2. CCNA Cisco Certified Network Associate Study Guide (Exam 640-801), Richard Deal , Series: Certification Press, Publisher: McGraw-Hill Osborne Media; 1 edition (August 26, 2003)

Database Management Systems

SYLLABUS

Module-1

INTRODUCTION: Introduction and applications of DBMS, Purpose of data base, Data, Independence, Database System architecture- Levels, Mappings, Database, users and DBA DATABASE DESIGN: Database Design Process, ER Diagrams - Entities, Attributes, Relationships, Constraints, keys, extended ER features, Generalization, Specialization, Aggregation, Conceptual design with the E-R model.

Module-2

THE RELATIONAL MODEL: Introduction to the relational model, Integrity constraints over relations, Enforcing integrity constraints, Querying relational data, Logical database design: E-R to relational, Introduction to views, Destroying/altering tables and views.

RELATIONAL ALGEBRA AND CALCULUS: Preliminaries, relational algebra operators, relational calculus - Tuple and domain relational calculus, expressive power of algebra and calculus.

Module-3

SQL: Basics of SQL, DDL, DML,DCL, structure – creation, alteration, defining constraints – Primary key, foreign key, unique, not null, check, IN operator, Functions - aggregate functions, Built-in functions – numeric, date, string functions, set operations, sub-queries, correlated sub-queries, Use of group by, having, order by, join and its types, Exist, Any, All , view and its types. transaction control commands – Commit, Rollback, Save point, cursors, stored procedures, Triggers

Module-4

SCHEMA REFINEMENT AND NORMAL FORMS: Introduction to schema refinement, functional dependencies, reasoning about FDs. Normal forms: 1NF, 2NF, 3NF, BCNF, properties of decompositions, normalization, schema refinement in database design, case studies.

Module-5

TRANSACTIONS MANAGEMENT: Transaction concept, transaction state, implementation of atomicity and durability, concurrent executions, Serializability, recoverability, implementation of isolation, transaction definition in SQL, testing for Serializability.

CONCURRENCY CONTROL AND RECOVERY SYSTEM: Concurrency control, lock-based protocols, time-stamp based protocols, validation based protocols, multiple

granularity. Recovery system - failure classification, storage structure, recovery and atomicity, log- based recovery, shadow paging, buffer management, failure with loss of non-volatile storage, advanced recovery techniques, remote backup systems.

OVERVIEW OF STORAGE AND INDEXING: Tree structured indexing - intuition for tree indexes, indexed sequential access method (ISAM), B+ Trees - a dynamic tree structure.

TEXT BOOKS:

1. Raghurama Krishnan, Johannes Gehrke , Database Management Systems, 3rd edition, Tata McGraw Hill, New Delhi,India.

2. Elmasri Navate, Fundamentals of Database Systems, Pearson Education,India.

REFERENCE BOOKS:

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan (2005), Database System Concepts, 5th edition, McGraw-Hill, New Delhi,India.

2. Peter Rob, Carlos Coronel (2009), Database Systems Design, Implementation and Management, 7thedition.

Mathematics-I

Module-1

Matrices Introduction, Elementary row and column transformations, Rank of matrix, Linear dependence, Consistency of linear system of equations, characteristic equation, CaleyHamilton Theorem, Eigen values and eigen vectors, Diagonalisation, Complex and unitary matrices. [10]

Module-2

Differential Calculus-I nth derivative, Leibnitz theorem, Partial differentiation, Euler's theorem, Curve tracing, Change of variables, Expansion of function of several variables. [8]

Module-3

Differential Calculus-II Jacobian, Approximation of errors, Extrema of functions of several variables, Lagrange's method of multipliers (Simple applications). [8]

Module-4

Multiple Integrals Double and triple integrals, Change of order of the Integration, Change of variables, Beta and Gamma functions, Application to area and volume, Dirichlet's integral and its applications. [8]

Module-5

Vector Calculus Point functions, Gradient, divergence and curl of a vector and their physical interpretations, Line, Surface and Volume integrals, Green's, Stoke's and Gauss divergence theorems. [8]

Reference Books:

1. Shanti Narayan A Text Book of Martices, S. Chand & Co.

2. Thomas/Finny Calculus and Analytical Geometry, Narosa House.

3. B.S. Grewal . Higher Engineering Mathematics, Publishers,

4. Piskunov, M. . Differential and Integral Calculus, Peace Pub.

5. Jaggi and Mathur : Advanced Engineering Mathematics, Khanna

6. C. Prasad . Mathematics for Engineers, Prasad

Computer Programming with C

SYLLABUS

Module-1

Introduction to the C Language – Algorithm, Pseudo code, Flow chart, Background, C Programs, Identifiers, Data Types, Variables, Constants, Input / Output, Operators(Arithmetic, relational, logical, bitwise etc.), Expressions, Precedence and Associatively, Expression Evaluation, Type conversions.

Module-2

Statements- Selection Statements(making decisions) – if and switch statements, Repetition statements (loops)-while, for, do-while statements, Loop examples, other statements related to looping – break, continue, go to, Simple C Program examples.

Module-3

Functions- Introduction to Structured Programming, Functions- basics, user defined functions, inter function communication(call by value, call by reference), Standard

functions. Storage classes-auto, register, static, extern, scope rules, arrays to functions, recursive functions, example C programs.

Module-4

Arrays– Basic concepts, one-dimensional arrays, two – dimensional arrays, multidimensional arrays, C programming examples Pointers – Introduction (Basic Concepts), pointers to pointers, compatibility, Pointer Applications, Arrays and Pointers, Pointer Arithmetic, memory allocation functions, array of pointers, pointers to void, pointers to functions, command –line arguments, Introduction to structures and unions.

Module-5

Strings – Concepts, C Strings, String Input / Output functions, string manipulation functions, string /data conversion.

Structures: Defining Structure, Declaration of Structure Variable, Accessing Structure members, copying and comparing structure variable, operation on individual member, nesting of structures, Array of structures. Application of pointers and function on Structures.

Union Defining Union Declaration of Union, difference between structure and Union, Introduction of Static and Dynamic memory allocation- The process of Dynamic memory allocation

Input and Output – Concept of a file, streams, text files and binary files, Differences between text and binary files, State of a file, Opening and Closing files, file input / output functions (standard library input / output functions for files), file status functions (error handling),Positioning functions.

TEXT BOOKS:

1. Computer Science: A Structured Programming Approach Using C, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.

2. The C Programming Language by Brian Kernighan and Dennis Ritchie 2nd edition

REFERENCE BOOKS:

1. Let Us C Yashavant kanetkar BPB.

2. Absolute beginner's guide to C, Greg M. Perry, Edition 2, Publisher: Sams Pub., 1994.

3. Computer Programming and Data Structures by E Balagurusamy, Tata McGraw Hill.

Basic Electronics Engineering

Module-1

Basic Circuit Concepts:

Passive components: Resistance, Inductance, Capacitance, Series parallel combinations, Kirchhoff's laws, Voltage current linearity.

Diodes : Semiconductor Diode characteristics, Modelling the semiconductor diode.

Diode Circuits: Clipper, Clamper circuits, Zener diode, LED, Photo diode, Varactor diode, Tunnel Diode

DC Power Supply: Rectifiers, HWR, FWR, Zener regulated power supply

Module-2

Transistors

BJT configuration and binary small and large signal model, Concept of differential amplifier using BJT.BJT Switch and logic circuits, Construction and working principle of MOSFET

Module-3

: OPAMP and OCILLATOR

Inverting amplifier, Non-Inverting amplifier Oscillator, Waveform Generator using OPAMP for Square wave, triangular wave.

Module-4

Communication Systems

Wired and Wireless Communication system, EMW and propagation, Antenna, Internet/Intranet, Optical Fibre.

Module-5

Digital Electronics

Number Systems, Binary arithmetic.

Logic gates: OR, NOT, AND, NOR, NAND EXOR, EXNOR gate, Truth table,Multiplexer, DEMUX, ENCODER, DECODER

Combinational Circuits: SOP, POS, K-MAP

Sequential circuits: Generic Block diagram, Shift registers, Counters

Computer Aided Engineering Drawing

Module -1

Introduction to Computer Aided Sketching through professional 2D & 3D CAD software. Introduction, Drawing Instruments and their uses, BIS conventions, Drawing sheets Lettering, Dimensioning and free hand practicing. Scales, regular polygons, tangents, ellipse, parabola, hyperbola, loci, cycloids, trochoids, spirals and involutes, helix, co-ordinate system and reference planes.

Module -2

Computer screen, layout of the software, standard tool bar/menus and description of most commonly used tool bars, navigational tools, and creation of 2D/3D environment. Selection of drawing size and scale. Commands and creation of Lines, Co-ordinate points, axes, poly-lines, square, rectangle, polygons, circles, ellipse, text, move, copy, off-set, mirror, rotate, trim, extend to next, split, chamfer, fillet, curves, constraints viz. tangency, parallelism, inclination and perpendicularity. Dimensioning, line conventions and lettering.

Module -3

Orthographic projections: Introduction, Definitions – Planes of projection, reference line and conventions employed, Projections of points in all the four quadrants,

Module-4

Projections of straight lines (located in First quadrant/first angle only), True and apparent lengths, True and apparent inclinations to reference planes (No application problems).

Module-5

Orthographic Projections of Plane Surfaces (First Angle Projection Only)

Introduction, Projections of plane surfaces – triangle, square, rectangle, pentagon, hexagon and circle. (only change of position method)