

Veer Bahadur Singh Purvanchal University, Jaunpur

Three Years Degree Course Syllabus for

B.Sc. (Computer Science)

Course Content & Marks Distribution

B.Sc. -I Year (CS)

S.No.	P/Code	Paper Name	Theory	Total
1.	BSC-101	Computer Fundamental & Programming In C	100	600
2.	BSC-102	Office Automation & PC Software	100	
3.	BSC-103	Discrete Mathematics	100	
4.	BSC-104	Digital Electronics	100	
5.	BSC-L11	Computer Fundamental & Office Automation Lab	100	
6.	BSC-L12	Programming In C Lab	100	

B.Sc. -II Year (CS)

S.No.	P/Code	Paper Name	Theory	Total
1.	BSC-201	Data Structure and Algorithms Using C	100	600
2.	BSC-202	Operating System	100	
3.	BSC-203	Object Oriented Programming using C++ and Java	100	
4.	BSC-204	Computer Organization & Architecture	100	
5.	BSC-L21	OPPS Lab	100	
6.	BSC-L22	Data Structure & Algorithms Lab	100	

B.Sc. -III Year (CS)

S.No.	P/Code	Paper Name	Theory	Total
1.	BSC-301	Software Engineering & Management	100	600
2.	BSC-302	Data and Communication Network	100	
3.	BSC-303	Database Management System	100	
4.	BSC-L31	DBMS Lab	100	
5.	BSC-L32	Project	200	

Computer Fundamental & Programming in C
(BSC-101)

UNIT-I

Introduction to Computers Introduction, Characteristics of Computers, Block diagram of computer. Types of computers and features, Mini Computers, Micro Computers, Mainframe Computers, Super Computers. Types of Programming Languages (Machine Languages, Assembly Languages, High Level Languages). Data Organization, Drives, Files, Directories. Types of Memory (Primary And Secondary) RAM, ROM, PROM, and EPROM. Secondary Storage Devices (FD, CD, HD, Pen drive) I/O Devices (Scanners, Plotters, LCD, Plasma Display).

UNIT-II

Number Systems: Introduction to Binary, Octal, Hexadecimal system Conversion, Simple Addition, Subtraction, Multiplication.

Algorithm and Flowcharts Algorithm: Definition, Characteristics, Advantages and disadvantages, Examples
Flowchart: Definition, Define symbols of flowchart, Advantages and disadvantages, Examples.

UNIT-III

Introduction to C: History of C, Structure of a C program. The C character set, Constants, Variables and keywords, Data type. Types of constants and variables. Type declaration and arithmetic instructions, Integer and float conversions. Type conversion in assignment, Operators in C, Hierarchy of operators, control instructions, Input-Output statements in C (Formatted and Unformatted)

UNIT-IV

Control Structures: Decision control structures, Logical operators, conditional operator and relational operators. Loop control structures – while, do-while, for loop, Break statement, Continue statement, switch-case control structure, Goto statement Bitwise operators Bitwise AND, OR, exclusive OR, compliment, right shift and left shift operators

UNIT-V

Arrays: One dimensional and multidimensional array, declaration, initialization and array Manipulations, sorting (Bubble sort) Strings – Basic Concepts, Library Functions.

Functions: Definition, function definition and prototyping, types of functions, type of arguments, Recursion, passing arrays to functions, storage class in C-automatic, register, external and static variables.

Pointers: Definition, notation, pointers and arrays, array of pointers and functions – call by value and Call by reference, Pointers to pointers. Definition, declaration, accessing structure elements, Array of structure in a structure, Pointers and structures, Unions – definition, declaration, accessing union elements, typedef, Enum Bit fields. Types of C preprocessor directives, Macros, data file handling, file opening modes, Text and Binary files.

Text Books:

1. Fundamental of Computers – By V. Rajaraman B.P.B. Publications.
2. Fundamental of Computers – By P.K. Sinha.
3. Computer Fundamentals – B. Ram – New Age International Publishers
4. Programming in C by Schaum Series.
5. Let Us C by Yashwant Kanetkar BPB.
6. Programming with C, Gottfried, TMH.

Reference Books:

1. C Programming Made Easy, Raja Ram, SCITECH.
2. Projects Using C, Varalaxmi, SCITECH.
3. Mastering Algorithms With C, Loudan, SPD/O'REILLY

Office Automation & PC Software
(BSC-102)

UNIT-I

Operating System and Services in O.S. Dos – History, Files and Directories, Internal and External Commands, Batch Files, Types of O.S.

Windows Operating Environment Features of MS – Windows, Control Panel, Taskbar, Desktop, Windows Application, Icons, Windows Accessories, Notepad, Paintbrush.

UNIT-II

Editors and Word Processors Basic Concepts, Examples: MS-Word, Introduction to desktop publishing.

Spreadsheets and Database packages Purpose, usage, command, MS-Excel, Creation of files in MS-Access, Switching between application, MS-PowerPoint

UNIT-III

MS Word: Introduction, Menus, Toolbars, Creating, Saving, Inserting files, Formatting, Editing Text, Find and Replace, Header and Footer, Working with text boxes, columns, pictures, charts and graph, Tables, Equations, WordArt, Printing, Mail Merge. Import and Export files, spelling and grammar checking, Thesaurus, Creating Bookmark and Hyperlinks.

UNIT-IV

MS Excel: Introduction, An overview of worksheet, Creating worksheet and workbook, Opening and saving Workbook and exiting Excel, Formatting, Protecting Cells, Producing Charts, Macros, Database, Using Tables, Using files with other Program. Goal seek, scenario, Pivot table, different functions (Antiemetic / String / Date and Time function etc.)

UNIT-V

MS PowerPoint: Introduction, Creation of Presentation, Built-in-wizard, working with Text, list, color and transitions. Header and Footer, Drawing tools, Animation and sound, Importing Objects from other applications.

MS Access: Introduction, Understanding Databases, Create Tables and Queries, Forms, Finding information in a Database, Create Report, Adding Graph.

Text Books:

1. Learn Microsoft Office – Russell A. Stultz – BPB Publication.
2. Harvey M Dietel, “ An Introduction to Operating System”, Pearson Education

References Books:

1. Microsoft Office – Complete Reference – BPB Publication.
2. Courter, G Marquis (1999). Microsoft Office 2000: Professional Edition. BPB.
3. PC Software – Shree Sai Prakashan, Meerut.
4. MS-Office 2000(For Windows) – By Steve Sagman.
5. S.K. Basandra, “**Computers Today**“, Galgotia Publications.

Discrete Mathematics

(BSC-103)

Unit-I

Set Theory: Introduction, Combination of sets, Multisets, Ordered pairs. Proofs of some general identities on sets.

Relations: Definition, Operations on relations, Properties of relations, Composite Relations, Equality of relations, Recursive definition of relation, Order of relations.

Functions: Definition, Classification of functions, Operations on functions, Recursively defined functions. Growth of Functions.

Natural Numbers: Introduction, Mathematical Induction, Variants of Induction, Induction with Nonzero Base cases. Proof Methods, Proof by counter – example, Proof by contradiction.

Unit-II

Algebraic Structures: Definition, Groups, Subgroups and order, Cyclic Groups, Cosets, Lagrange's theorem, Normal Subgroups, Permutation and Symmetric groups, Group, Homomorphism's, Definition and elementary properties of Rings and Fields, Integers Modulo n .

Unit-III

Partial order sets: Definition, Partial order sets, Combination of partial order sets, Hasse diagram.

Lattices: Definition, Properties of lattices – Bounded, Complemented, Modular and Complete lattice.

Boolean Algebra: Introduction, Axioms and Theorems of Boolean algebra, Algebraic manipulation of Boolean expressions. Simplification of Boolean Functions, Karnaugh maps, Logic gates, Digital circuits and Boolean algebra.

Unit-IV

Propositional Logic: Proposition, well formed formula, Truth tables, Tautology, Satisfiability, Contradiction, Algebra of proposition, Theory of Inference.

Predicate Logic: First order predicate, well formed formula of predicate, quantifiers, Inference theory of predicate logic.

Unit-V

Trees : Definition, Binary tree, Binary tree traversal, Binary search tree.

Graphs: Definition and terminology, Representation of graphs, Multigraphs, Bipartite graphs, Planar graphs, Isomorphism and Homeomorphism of graphs, Euler and Hamiltonian paths, Graph coloring, Recurrence Relation & Generating function: Recursive definition of functions, Recursive algorithms, Method of solving recurrences.

Combinatorics: Introduction, Counting Techniques, Pigeonhole Principle, Pólya's Counting Theory.

Text Books:

1. Koshy, Discrete Structures, Elsevier Pub. 2008
2. Kenneth H. Rosen, Discrete Mathematics and Its Applications, 6/e, McGraw-Hill, 2006.
3. B. Kolman, R.C. Busby, and S.C. Ross, Discrete Mathematical Structures, 5/e, Prentice Hall, 2004.
4. E.R. Scheinerman, Mathematics: A Discrete Introduction, Brooks/Cole, 2000.
5. R.P. Grimaldi, Discrete and Combinatorial Mathematics, 5/e, Addison Wesley, 2004.
6. Jean Paul Trembley, R Manohar, Discrete Mathematical Structures with Application to Computer Science, McGraw-Hill, Inc. New York, NY, 1975.

B.Sc. (Computer Science)

B.sc – I Year

MM-100

Digital Electronics (BSC-104)

UNIT-I

Number Systems and Logic Gates:

Introduction to decimal, Binary and hexadecimal number systems and their inter-conversions, Signed and fractional binary number representations, BCD, Excess-3 and Gray codes, alphanumeric representation in ASCII codes. Positive and Negative Logic, Basic Logic gates (NOT, OR, AND) & derived gates (NAND, NOR, EX-OR) Symbol and truth table, Applications of Ex-OR gates as parity checker and generator.

UNIT-II

Boolean Algebra and Karnaugh maps

Boolean algebra rules and Boolean laws: Commutative, Associative, Distributive, AND, OR and Inversion laws, De-Morgan's theorem, Universal gates.

Min terms, Max terms, Boolean expression in SOP and POS form, conversion of SOP/POS expression to its standard SOP/POS form., Simplifications of Logic equations using Boolean algebra rules and Karnaugh map.

UNIT-III

Arithmetic Circuits

Rules of binary addition and subtraction, subtraction using 1's and 2's complements, Half adder, full adder, Half subtractor, Full subtractor, Four bit parallel adder, Universal adder / subtractor, Digital comparator, Introduction to ALU.

UNIT-IV

Combinational Circuits

Multiplexer (2:1, 4:1), de-multiplexer (1:2, 1:4) and their applications, Code converters- Decimal to binary, Hexadecimal to binary, BCD to decimal, Encoder & decoder 3x4 matrix keyboard encoder, priority encoder, BCD to seven segment decoder.

UNIT V

Sequential Circuits: Flip flops, RS using NAND/NOR, latch, clocked RS, JK, Master slave JK, D and T.

Logic Families: RTL, DTL, TTL, CMOS – Tristate logic – Specification and transfer characteristics of basic TTL interfaces, -Standard

Text/ Reference Books:

1. Digital Electronics: Jain R.P., Tata McGraw Hill
2. Digital Principles and Applications: Malvino Leach, Tata McGraw-Hill.
3. Digital Fundamentals: Floyd T.M., Jain R.P., Pearson Education

**Data Structure and Algorithms Using C
(BSC-201)**

UNIT-I

Structure, definition, and application, Lists, Basic Terminology, Static Implementation of Lists, Pointer Implementation of Lists, Insertion in a List, Deletion from a List, Storage of Sparse, Arrays using Linked List, Doubly Linked Lists, Circular Linked List.

UNIT-II

Defining Stack and Queue, Stack Operations and Implementation, Array Implementation, Pointer Implementation, Stack Applications, Convert Number Bases by Using Stacks, Infix to Postfix Conversion, Queues: Operations and Implementation, Queue Application, Priority Queues, Defining Graph, Basic Terminology, Graph Representation, Graph Traversal, Depth First Search (DFS), Breadth First Search (BFS),

UNIT-III

Advanced Data Structures: Red-Black trees, Shortest Path Problem, Minimal Spanning Tree, Binary Trees, In order Traversal, Post order Traversal, Preorder Traversal, Binary Search Trees, Operations on a BST, Insertion in Binary Search Tree, Deletion of a node in BST, Search for a key in BST, Height Balanced Tree.

UNIT-IV

Algorithms, Analyzing algorithms, Complexity of algorithms, Growth of functions, Performance measurements ,Searching and Sorting techniques, Sequential Search, Binary Search, Divide and Internal Sort, Insertion Sort, Bubble Sort, Quick Sort, 2-way Merge Sort, Heap Sort, Radix sort and Shell sort.

UNIT-V

Dynamic programming with examples such as Kanpsack, All pair shortest paths – Warshal’s and Floyd’s algorithms, Resource allocation problem, Greedy methods with examples such as Optimal Reliability Allocation, Knapsack,Backtracking, Branch and Bound with examples such as Travelling Salesman Problem, Graph Coloring, n-Queen Problem, Hamiltonian Cycles and Sum of subsets.

Text Books:

1. Classical Data Structures: D. Samanta. PHI, New Delhi.
2. Data Structure: Lipsctuz Schum Outline Series.
- 3.Thomas H. Coreman, Charles E. Leiserson and Ronald L. Rivest, “Introduction to Algorithms”, Printice Hall of India.
4. RCT Lee, SS Tseng, RC Chang and YT Tsai, “Introduction to the Design and Analysis of Algorithms”, Mc Graw Hill, 2005.

Reference Books:

1. Data structure Using C: Y. Kanetkar.
2. Data Structures Using C: Tennenbaum.
3. Data structures by Tremblay Sorenson.
4. Data structures by Bhagatsingh Naps.

B.Sc. (Computer Science)

B.sc – II Year

MM-100

Operating System (BSC-202)

UNIT-I

Definition of operating system (OS), History of OS, Simple Batch Systems, Multi-programmed Batched Systems, Time-Sharing Systems, Personal Computer system, Distributed Systems and Real-Time Systems, Operating System, Structures-Command Interpreter System, Operating System Services, System Calls, System Programs.

UNIT-II

Process Management:

Process Concept, Process control Block, process Scheduling, CPU scheduling-Basic Concepts, CPU scheduling, Scheduling Criteria, Round Robin Scheduling, Real Time Scheduling.

UNIT-III

Storage Management:

Basic Concepts, Logical and Physical Address Space, Swapping, Contiguous Allocation, Paging Segmentation, Virtual Memory- Demand Paging, Paging Replacement, Thrashing and Demand Segmentation.

File System:

File Concept, Access Methods, Directory Structure, Protection, File System Structure. Allocation methods, Free Space Management.

UNIT-IV

Definition Deadlock, Deadlock Characterizations, method for Handling Deadlocks, Deadlock prevention, Avoidance, Detection, recovery from Deadlock.

UNIT-V

I/O Management and Disk Scheduling: I/O devices, and I/O subsystems, I/O buffering, Disk storage and disk scheduling, RAID. File System: File concept, File organization and access mechanism, File directories, and File sharing, File system implementation issues, File system protection and security.

Text Books:

1. Operating System Concept: Silbershaz (Addision Education).
2. Operating Systems by P. Balakrishna Prasad [Scitech Publication].

Reference Books:

1. Operating Systems - H.M. Deitel - Addision Wesley.
2. Operating System: A.S.Godbole (TMH)
3. Modern Operating Systems: Tenenenbaum (Pearson Education)
4. Operating System: Peterson.

B.Sc. (Computer Science)
B.sc – II Year

MM-100

Object Oriented Programming using C++ and Java
(BSC-203)

UNIT-I

OOP concept, Procedural vs OOP programming, OOP terminology and features, Tokens, Character set, Keywords, Data-types, Data Types declarations, Constants and variables, expressions, Standard Library and header files. Operator and Expressions: Arithmetic Operator, Increment/Decrement Operator, Relational Operator, Logical Operator and conditional operators, library functions, Logical Expressions.

UNIT-II

Flow of control statements: Selection statements, Iteration statement, Jump statement, Construction of loops and implementation, While, Do-while, For statements nested loops. If-else, switch, break, continue and Go to statements.

Classes and Objects: Need for Classes, Declaration of Classes, referencing class Members, Scope of class and its members Nested Classes, Functions in a class: Inline Functions, Constant Member functions, Nesting of Member Functions, friend function, Memory allocation of objects, Arrays of objects, Static Class Member

UNIT-III

Functions, function definition, Default arguments, Constant arguments, Call by value, Call by reference, returning from a function, storage class specifier and variables, storage class specifier and Functions automatic, external and static variables, Pointer: Declarations, Passing to a function, Operations on Pointers

UNIT-IV

Arrays two dimensional and multidimensional arrays, Arrays of Pointers, Pointers and functions, Constructors and Destructor: Declaration, Definition and characteristics, Function Overloading, **Inheritance:** Need, Different forms, Single Inheritance, Multilevel Inheritance, C++ Memory Map: Dynamic and Static Allocation of Memory, Stacks Queues and Linked Lists, Declarations, File handling: Open, Close, Create, Process, Detecting EOF.

Java Programming: Introduction, Operator, Data types, Variables, Methods & Classes, Multithread Programming, I/O, Java Applet.

UNIT-V

Java Library: String Handling, Input/Output exploring Java.io, Networking, Applets classes, Event Handling, Introduction to AWT, Working with window, Graphics, AWT Controls, Layout Manager and Menus, Images, Additional packages.

Software Development using Java:

Java Beans, Java Swing, Java Servlets, Migrating from C++ to java, Application of java, Dynamic Billboard Applet, Image Menu: An image based menu, Lavatron Applets, Scrabblets, JDBC, Brief functioning of upper layer E-mail and their applications.

Text Books:

1. The Art of programming through flowcharts & algorithm by Anil B. Chaudhari Firewall Media, Laxmi publication, New Publication.
2. Programming in C++ by E. Balagurusamy TMH Publications.
3. James Rumbaugh etal, "Object Oriented Modeling and Design", PHI
4. Herbert Schildt, "The Complete Reference: Java", TMH.
5. E. Balagurusamy, "Programming in JAVA", TMH.

Reference Books:

1. Programming with C++, by John Hubbard, AtulKahate.
2. Programming with C++ – Y. Kanetkar.
3. C++ Programming – Holzner, PHI Publication.
4. C++: The Complete Reference: The Complete Reference 4th Edition, Herbert Schildt.

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B.sc – II Year

MM-100

**Computer Organization & Architecture
(BSC-204)**

UNIT-I

Number representation; fixed and floating point number representation, IEEE standard for floating point representation. Error detection and correction codes: Hamming code.

Digital computer generation, computer types and classifications, functional units and their interconnections, buses, bus architecture, types of buses and bus arbitration. Register, bus and memory transfer.

UNIT-II

Processor Design: Processor organization, information representation, Instruction format, Addressing Modes(Implied mode, immediate mode, register indirect mode, auto increment or Auto decrement mode, direct addressing mode, indirect addressing mode, relative addressing mode, Index Addressing mode), Addition and subtraction of signed numbers, look ahead carry adders. Multiplication: Signed operand multiplication, Booths algorithm and array multiplier. Division and logic operations. Floating point arithmetic operation.

UNIT-III

Control Unit: Instruction types, formats, instruction cycles and subcycles (fetch and 8 execute etc) , micro-operations, execution of a complete instruction. Hardwire and microprogrammed control: microprogramme sequencing, wide branch addressing, microinstruction with next address field, pre-fetching microinstructions, concept of horizontal and vertical microprogramming.

UNIT-IV

Memory Organization: Classification of memories (RAMs (Static & Dynamic), ROMs, PROMs, EPROMs,EEPROMs, Hard Disk, Floppy Disk and CD-ROM), Memory Hierarchy, Optimization of memory hierarchy,addressing scheme for main memory, segmented memory system, paged segment memory. High speed memories, Characteristics of Cache memory, Virtual memory: concept implementation.

UNIT-V

Input / Output: Peripheral devices, I/O interface, I/O ports, Interrupts: interrupt 8 hardware, types of interrupts and exceptions. Modes of Data Transfer: Programmed I/O, interrupt initiated I/O and Direct Memory Access., I/O channels and processors. Serial Communication: Synchronous & asynchronous communication, standard communication interfaces

Text Books:

1. Computer System Architecture, By. M. Morris Mano, PHI.
2. Hamacher V.C., Viraesic Z.G. and Zaky S.G., "Computer Organization" McGraw Hill.
3. Computer Architecture and Organization, By John P. Hayes, McGraw Hill.
4. Computer Organization and Design, by John L. Hennessy & David A. Patterson, Morgan Kaufman.

Reference Books:

1. William Stallings, "Computer Organization & Architecture", Pearson.
2. BARTEE, "Digital Computer Fundamentals" TMH Publication.
3. MORRIS MANO, "Computer System Architecture" PHI.

B.Sc. (Computer Science)
B.sc – III Year

MM-100

Software Engineering and Management
(BSC-301)

UNIT-I

Introduction, what is software engineering? Software Development Life Cycle, Requirements Analysis, Software Design, Coding, Testing, Maintenance etc.
Software Requirement Specification, Waterfall Model, Prototyping Model, Iterative Enhancement Model, Spiral Model, Role of Management in Software Development, Role of Metrics and Measurement, Problem Analysis, Requirement Specification, Validation, Metrics, Monitoring and Control.

UNIT-II

System Design, Problem Partitioning, Abstraction, Top-down and bottom-up design, Structured Approach, Functional v/s Object-Oriented Approach, Design specification & verification, metrics, Monitoring & Control Coding, Top-down & Bottom-up, Structured Programming, Information Hiding, Programming Style, Internal Documentation, Verification, Metrics, Monitoring & Control.

UNIT-III

Fundamentals of Software Project Management (SPM), Need Identification, Vision and Scope document, Project Management Cycle, SPM Objectives, Management Spectrum, SPM Framework, Software Project Planning, Planning Objectives, Project Plan, Types of project plan, Structure of a Software Project Management Plan, Software project estimation, Estimation methods, Estimation models, Decision process. Project Elements, Work Breakdown Structure (WBS), Types of WBS, Functions, Activities and Tasks, Project Life Cycle and Product Life Cycle, Ways to Organize Personnel, Project schedule, Scheduling Objectives, Building the project schedule, Scheduling terminology and techniques, Network Diagrams: PERT, CPM, Bar Charts: Milestone Charts, Gantt Charts

UNIT-IV

Dimensions of Project Monitoring & Control, Earned Value Analysis, Earned Value Indicators: Budgeted Cost for Work Scheduled (BCWS), Cost Variance (CV), Schedule Variance (SV), Cost Performance Index (CPI), Schedule Performance Index (SPI), Interpretation of Earned Value Indicators, Error Tracking, Software Reviews, Types of Review: Inspections, Deskchecks, Walkthroughs, Code Reviews, Pair Programming.

UNIT-V

Testing Objectives, Testing Principles, Test Plans, Test Cases, Types of Testing, Levels of Testing, Test Strategies, Program Correctness, Program Verification & validation, Testing Automation & Testing Tools, Concept of Software Quality, Software Quality Attributes, Software Quality Metrics and Indicators, The SEI Capability Maturity Model (CMM), SQA Activities, Formal SQA Approaches: Proof of correctness, Statistical quality assurance, Clean room process.

Text Books:

1. Software Engineering- A Practitioners Approach, R. Pressman, McGraw Hill.
2. An Integrated Approach to Software Engineering, Pankaj Jalote, Narosa.
4. Fundamentals Of Software Engineering 4th Edition, Rajib Mall.
- 4.M. Cotterell, Software Project Management, Tata McGraw-Hill Publication.
5. Royce, Software Project Management, Pearson Education
6. Kieron Conway, Software Project Management, Dreamtech Press

Reference Books:

1. K.K. Aggarwal & Yogesh Singh "Software engineering", 2nd Ed., New Age International 2005.
2. I. Sommerville, "Software Engineering", Addison Wesley, 2002.
3. James Peter, W. Pedrycz, "Software Engineering: An Engineering Approach" John Wiley & Sons.

B.Sc. (Computer Science)

B.sc – III Year

MM-100

Data and Communication Network (BSC-302)

UNIT-I

Introduction: Data communications, Components, Data representation (ASCII, ISO etc.), Direction of data flow (Simplex, Half duplex, Full duplex), Overview of Data & Signal Bits. Baud & Bit Rate, Networks-Distributed Processing, Network Criteria, Physical structure (type of connection, topology), Types of network, Guided & Unguided Media.

UNIT-II

Analog & Digital Transmission, Modulation, Need for Modulation, Modulation Techniques. Transmission media- Twisted pair cable, coaxial cable, fiber optic cable, Microwave and Satellite Communication. Switching and Switching Techniques. Reference Models- OSI and TCP/IP Reference Models. Network Devices- Repeaters, Hubs, Bridges, Switches, Router, Gateway. Multiplexing- TDM, FDM, CDM.

UNIT-III

Representation of deterministic and stochastic signals, random noise characterization in communication systems, signal-to-noise ratio, characterization of communication signals and systems: signal space representations, representation of analog and digitally modulated signals, spectral characteristics of modulated signals

Optimal receivers: Receivers for signals corrupted by AWGN, Error performance Analysis of receivers for memory-less modulation, optimal receivers for modulation methods with memory, OFDM, MIMO, Source Coding, Channel Coding (Hamming codes)

UNIT-IV

Error Control, Flow Control, Sliding Window Protocols, HDLC, PPP, Local area networks: Ethernet, Fast Ethernet, Token Ring, Introduction to Gigabit Ethernet and Wireless LANs; Hubs, bridges and switches

UNIT-V

MAC Layer Static Channel Allocation in LANs and MANs, Dynamic Channel Allocation in LANs and MANs, ALOHA, Carrier Sense Multiple Access Protocols, Collision-Free Protocols, Limited-Contention Protocols, Wavelength Division Multiple Access Protocols, Wireless LAN Protocols, IEEE Standard 802.3

Text Books:

1. Madhow, U., (2008), Fundamentals of Digital Communication, Cambridge University Press
2. Lathi, B. P. & Ding, Z., (2010), Modern Digital and Analog Communication Systems, Oxford University Press
3. Stallings, W., (2010), Data and Computer Communications, Pearson.
4. Andrew S. Tanenbaum, "Computer Networks" Pearson.
5. Ajit Pal, "Data Communication and Computer Networks", PHI
6. Dimitri Bertsekas, Robert G. Gallager, "Data Networks", Prentice Hall, 1992
7. Computer networks – Tannenbaum.
8. B.A. Forouzan- Data Communications and networking (3rd Ed.)-TMH

Database Management System
(BSC-303)

UNIT-I

DBMS: Definition: Databases, DBMS, Problems with traditional file processing system, Objectives of the database systems, Three level architectures of DBMS, Component of DBMS, Database Administrator, Database Users, Data model, Different types of data models, Concepts of Hierarchical, Network Models.

UNIT-II

E-R Models: Basic Concepts, Entity, Attributes, Relation Ship, Mapping, Keys, Weak and Strong Entity Set, Problems on E-R Diagrams, Extended E-R Features: Specialization, Generalization, Aggregation, Problems on Reduction of an E-R Schema to Tables, Tabular representation of Strong, Weak entity Sets and Relationship Sets.

UNIT-III

Functional Dependency: Functional Dependency, Fully Functional Dependency, Partial Dependency, Transitive Dependency, Multi Valued Dependency. Normalization, Normal Forms (1NF, 2NF, 3NF, BCNF, 4NF, 5NF). Problems on Normal forms.

UNIT-IV

Relational data Model and Language: Relational data model concepts, integrity 8 constraints, entity integrity, referential integrity, Keys constraints, Domain constraints, relational algebra, relational calculus, tuple and domain calculus. Introduction on SQL: Characteristics of SQL, advantage of SQL. SQL data type and literals. Types of SQL commands. SQL operators and their procedure. Tables, views and indexes. Queries and sub queries. Aggregate functions. Insert, update and delete operations, Joins, Unions, Intersection, Minus, Cursors, Triggers, Procedures in SQL/PL SQL

UNIT-V

Transaction Processing Concept: Transaction system, Testing of serializability, 8 serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures, log based recovery, checkpoints, deadlock handling.

Distributed Database: distributed data storage, concurrency control, directory system

Concurrency Control Techniques: Concurrency control, Locking Techniques for 8 concurrency control, Time stamping protocols for concurrency control, validation based protocol, multiple granularity, Multi version schemes, Recovery with concurrent transaction, case study of Oracle.

Text Books:

1. Data Base System Concepts by a Silbers Chatz by Henry Korth and S. Sudarshan [Mcgraw-Hill Ltd. New Delhi] 3rd Edition.
2. Introduction to Data Base Management by NAVEEN PRAKASH [Tata McGraw Hill Ltd.].
3. Elmasri, Navathe, "Fundamentals of Database Systems", Addison Wesley
4. O'Neil, Databases, Elsevier Pub.

Reference Books:

1. Bipin C. Desai, An Introduction to Database Systems, Galgotia Publications.
2. Raghu Ramakrishnan & Johannes Gerhrke, "Data Base Management Systems", McGraw Hill International Edition, 2000.
3. Muzumdar, Introduction to Database Management Systems, TMH.