MAHARISHI MAHESH YOGI VEDIC VISHWAVIDYALAYA

DIRECTORATE OF DISTANCE EDUCATION

SCHEME FOR BACHELOR OF COMPUTER APPLICATION

(BCA)

THIS IS A THREE YEAR PROGRAMME LEADING TO BACHELOR OF COMPUTER APPLICATION

BCA First Year

SUB. CODE	PAPER	NOMENCLATURE
1DBCA1	I	Fundamentals of Maharishi Vedic Science (Maharishi Vedic Science –I)
1DBCA2	II	Fundamentals of Computer and Information Technology
1DBCA3	III	Programming Methodology and C Programming
1DBCA4	IV	Digital Electronics
1DBCA5	V	RDBMS using Oracle
1DBCA6	VI	Discrete Mathematics
1DBCA7	VII	Advance Calculus and Matrices
1DBCA8	VIII	Communicative English
1DBCA9	IX	Computer Lab –I : PC Package and Programming Using C
1DBCA10	X	Computer lab – II: Oracle

BCA Second Year

Paper Code	Paper No.	Nomenclature
2DBCA1	I	Advanced Concept of Maharishi Vedic Science (Maharishi Vedic Science –II)
2DBCA2	II	Visual Basic
2DBCA3	III	Data Structure Using C
2DBCA4	IV	System Analysis & Design and MIS
2DBCA5	V	Computer Networking
2DBCA6	VI	Calculus, Differential Equation and Mechanics
2DBCA7	VII	Advanced Calculus, Partial Differential Equations, Complex Analysis and Abstract Algebra.
2DBCA8	VIII	Communicative Hindi
2DBCA9	IX	Computer Lab –I : Programming in Visual Basic
2DBCA10	X	Computer lab – II: Data Structure Using C

BCA Third Year

Paper Code	Paper No.	Nomenclature
3DBCA1	I	Introduction to Operating System
3DBCA2	II	Core Java
3DBCA3	III	Software Engineering and Web Page Designing
3DBCA4	IV	Data Warehousing and Data Mining
3DBCA5	V	Real Analysis, Linear Algebra and Discrete Mathematics
3DBCA6	VI	Metric Spaces, Numerical Analysis and ELEMENTARY STATITICS
3DBCA7	VII	Science of Communication and E- Commerce
3DBCA8	VIII	Computer Lab –I : Core Java
3DBCA9	IX	Computer lab – II: Web Page Designing
3DBCA10	X	Project

FUNDAMENTALS OF MAHARISHI VEDIC SCIENCE

(MAHARISHI VEDIC SCIENCE – I)

DIPLOMA/ADVANCED DIPLOMA/UG COURSES

UNIT-1

Meaning & Importance of Guru Pujan.

Meaning of meditation, Mann, Intelligence, Chita, Ego, Thought .

UNIT-II

Name of forty areas of Vedic Science and their expression in Human Physiology and characteristics of consciousness.

Consciousness, types of consciousness, characteristics of higher stages of consciousness.

UNIT-III

Maharishi's Yoga, Transcendental Meditation- a general Introduction, Types of Speech, TM Sidhi Programme, Principle of Yoga Asanas and their Concept.

UNIT-IV

Introduction: Maharishi Vedic Management.

Fundamental elements of Vedic Management –Totality

Management of Science and Art .

UNIT-V

Vedic Management and Leadership.

The Idea Leadership is based upon the Totality of Employee's Style

Suggested Readings:

- Chetna –His Holiness Maharishi Mahesh Yogijee
- Maharishi Sandesh -1and 2 , II-His Holiness Maharishi Mahesh Yogijee
- Scientific Yoga Ashanas –Dr.Satpal.
- Dhyan Shailly by Brahmchari Dr. Girish Ji

FUNDAMENTAL OF COMPUTER AND INFORAMATION TECHNOLOGY

UNIT-1 Introduction to computer and information technology : History of development of computers, computer system concept , characteristics, capabilities and limitation , types of computer –analog , digital , hybrid , general, special purpose, micro, mainframe, super , generation of computer , personal computer (PCs) –IBM PCs, characteristics , PC/PCXT/PCAT-configurations, Pentium and Newer PCs specification and main characteristics , types of PCs-Desktop, Laptop, Notebook, Palmtop , Workstation etc , their characteristics.

Computer Organizations and Working: Basic component of a computer system –control unit, ALU, INPUT /Output function and characteristics, memory –RAM, ROM, EPROM, PROM and other types of memory.

UNIT-II Input Devices: Keyboard, Mouse, Trackball, Joysticks, Digitizing tablet, Scanner, Digital Camera, MICR, OCR, OMR, BAR-CODE Reader, Voice Recognition, Light Pen, and Touch Screen.

Output Devices: Monitor –characteristics and types of monitor –digital , analog size, resolution, refresh rate , Interlaced /Non Interlaced , Dot Pitch , Video Standard –VGA,SVGA,XGA etc, Printer –Daisy wheel , Dot Matrix, Inkjet , Laser , line printer , plotter , sound card and speakers.

Storage Devices: Storage Fundamental –Primary VS Secondary , Data Storage and Retrieval method –Sequential , Direct and Index Sequential , Various Storage Devices –Magnetic Tape ,Magnetic disks , Cartridge Tape , data drives, hard disk drives, floppy (Winchester disks), Disks , Optical Disks , CD,VCD,CD-R,CD-RW, ZIP Drive.

UNIT-III Computer Software: Need, types of software –system software, application software, system software-operating system, utility program, programming Language, assemblers, compiler and interpreter.

Operating System: Function, types –batch, single, Multiprogramming, Multiprocessing. Programming languages-Machine, Assembly High Level, 4GL, their merit and demerits.

Application Software: Word –processing, spreadsheet, presentation graphics, data base management software, characteristics, user and example and area of application of each of them.

Number System: Data representation in computer, number system of computer –Binary, Octal, Hexa-Representation & their conversion, coding system –ASCII, BCD, EBCDIC etc.

UNIT-IV Data Communication and Networks: communication channels –twister , coaxial , fiber , optic .Types of Networks –LAN,WAN,MAN etc, Topologies of LAN –Ring , BUS ,STAR,MESH and TREE topologies , components of LAN-media , NIC,NOS, Bridges, HUB, Routers Repeater and Gateway .

UNIT-V Computer virus: Virus working principles, types of viruses, virus detection and prevention, viruses on networks. Use of communication and IT in daily life.

Text & Reference Books:-

1. Learning Window 98 step by step by Rajeev Mathur , BPB Publication.
2. Learning Word 97 for Window by Rajeev Mathur , BPB Publication,
3. Learning Excel 97 for Window by Rajeev Mathur , BPB Publication.
4. A First Course in Computer by Sanjay Saxena , Vikas Publishing House New Delhi.
5. Microsoft Office 2000 by A. Mansoor by Pragya Publications.

PROGRAMMING METHODOLOGYAND C PROGRAMMING

UNIT-I: An overview: Problem identification, analysis, design, coding, testing & debugging, implementation, modification & maintenance; algorithms & flowcharts; Characteristics of a good program - accuracy, simplicity, robustness, portability, minimum resource & time requirement modularization; Rules/ conventions of coding, documentation, naming variables; Top down design; Bottom-up design.

UNIT-II: Fundamentals of C Programming: History of C; Structure of a C Program; Data types; Constant & Variable, naming variables; Operators & expressions; Control Constructs - if-else, for, while, do-while; Case switch statement; Break, continue, exit(), goto & labels, Arrays; Formatted & unformatted I/O; Type modifiers & storage classes; Ternary operator; Type conversion & type casting; Priority & associativity of operators.

UNIT-III: Modular Programming: Functions; Arguments; Return value; Parameter passing - call by value, call by reference; Return statement; Scope, visibility and lifetime rules for various types of variable, static variable; Calling a function; Recursion - basics, comparison with iteration, types of recursion- direct, indirect, tree and tail recursion, when to avoid recursion, examples.

UNIT-IV: Advanced Programming Techniques: String; Pointer v/s array; Pointer to pointer; Array of pointer & its limitation; Function returning pointers; Pointer to function, Function as parameter; Structure -basic, declaration, membership operator, pointer to structure, referential operator, self referential structures, structure within structure, array in structure, array of structures; Union - basic, declaration; Enumerated data type; Typedef; command line arguments.

UNIT-V: Miscellaneous Features: File handling and related functions; printf & scanf family; C preprocessor- basics, #Include, #define, #undef, conditional compilation directive like #if, #else, #elif, #endif, #ifdef and #ifndef; Variable argument list functions.

Text Books:

1. Kerninghan & Ritchie, "The C Programming Language", PHI
2. Programming in Ansi C by E. Balaguruswamy, TMH, 2004
3. Let us C Yaswant Kanetkar, BPB publications
4. Gottfried:"Problem solving in C",Schaum Series
5. How to solve it by Computer by R.G. Dromey (P.H.II),1994

DIGITAL ELECTRONICS

UNIT-I:

Data types and number System , Binary number system ,Octal & Hexa-decimal number system , I's& 2's complement ,Binary Fixed –point Representation , Arithmetic operation on Binary number , Overflow & underflow ,Floating Point Representation , codes ,ASCII, EBCDIC codes , Gray code , Gray code ,Excess -3& BCD, Error detection & correction codes.

UNIT-II:

Logic Gate , AND , OR NOT gates and their truth tables , NOR, NAND & XOR gate , Boolean Algebra , basic Boolean law's , Demorgan's theorem , MAP simplification , Minimization technique , K-Map , sum of product & product of sum.

UNIT-III:

Combination & Sequential circuit , half adder & full adder , full subtractor, Flip –flops RS, D ,JK, & T flip-flops ,shift register , RAM and ROM , Multiplexer , Demultiplexer , Encoder, Decoder, Idea about Arithmetic Circuit , program control , instruction Sequencing.

UNIT-IV:

I/O Interface , properties of simple I/O devices and their controller, Isolated versus memory-mapped I/O , Mode of Data transfer, Synchronous and Asynchronous data transfer, handshaking, Asynchronous serial transfer , I/O Processor.

UNIT-V:

Auxiliary memory, magnetic Drum , disk & tape ,semi- conductor memories ,Memory Hierarchy , Associative Memory , Virtual Memory ,Address space & Memory Space , Address mapping page tables , page replacement , cache memory , hit ratio , mapping , hit ratio ,mapping technique, Writing into Cache

Suggested Reading:

Barite." Digital computer fundamental "TMH Publication ISBN 0-07-003899-6

Melvin, "Digital computer Electronic "TMH Publication ISBN 0-07-462235-8

Morris mano," Computer system architecture "PHI publication ISBN 81-203-0417-9

RELATIONAL DATA BASE MANAGEMENT SYSTEM
(USING ORACLE)

UNIT-I:- INTRODUCTION: -Advantages of DBMS approach, various views of data, data independence, Schema & sub-schema, Primary concepts of data models, Database languages, Transaction management, Database administrator & uses, data dictionary, Overall system architecture.
ER MODEL: - Basic concept, Design issues, Mapping constraints, Keys, ER diagram, weak & strong entity sets, specialization & generalization, aggregation, inheritance, design of ER schema, Reduction of ER schema to tables.

UNIT –II: - DOMAIN RELATIONS & KEYS :- Domains, Relations, Kinds of relation, relational databases, various types of keys, candidate, primary, alternate & foreign Keys.
RELATION ALGEBRA & SQL :- The structure, relation algebra with extended operations, Modification of database, idea of relational calculus, Basic structure of SQL, set operation, Aggregate function, Null values, Nested subqueries, Derived relations, views modification of database, Join relations, DDL & SQL .

UNIT– III:- FUNCTIONAL DEPENDENCIES & NORMALIZATION: Base definitions, Trivial & non-Trivial dependencies, Closure set of dependencies & of attributes, Irreducibleset of dependencies, introduction to normalization, Non- loss decomposition, FD diagram of I, II & III NF, Dependencies prevention, BCNF, Multivalued dependencies prevention's, BCNF, Multivalued dependencies & ANF, Join dependencies & 4 NF. DATABASE INTEGRITY :- General idea, Integrity rules, Domain rules, Attribute rules, Relation rules, Database rule, assertions, triggers, Integrity & SQL.

UNIT- IV: - DISTRIBUTED DATABASES: - Basic idea, distributed data storage, Data replication, Data Fragmentation, horizontal, vertical & mixed fragmentation. EMERGING TRENDS IN DBMS :- Object – Oriented database- Basic idea & the model Object structures Object, Class, inheritance, multiple object identity, Data warehousing terminology, definitions, characteristics, Data mining & its overview, Database on www,
multimedia database difference with conventional DBMS, issues, similarity based retrieval continuous media data, multimedia data formats, video servers.

UNIT- V: - NETWORK & HIERARCHICAL MODEL: Basic idea , Data structure diagram, DBTG model, implementation, Tree structure diagram, Implementation techniques, comparison of three models.
TRANSACTION CONCURRENCY & RECOVERY:- Basic concept, ACID properties, Transaction state, Implementation of atomicity & durability concurrent executions, Basic idea of serializability, Basic idea of concurrency control, Basic idea of deadlock, Failure
classification, storage structure - types, stable storage implementation, data access, Recovery& Atomicity – Log based recovery, deferred database modifications, immediate database modifications, checkpoints.

Text Books:-

1. Henry F.Korth & A. Silbershatz: Data System Concepts. Mc-GrawHill.
2. Arun K. Majumdar & P.Bhattacharya: Data Base Management System. TMH

References Books:-

1. Bipin C. Desai: An Introduction to Database System, Galgotia Pub. Co.Ltd.
2. Jeffrey O. Ullman: Principles of Database Systems, Galgotia Pub. Co.Ltd.
3. James Martin: Principles of Database Management . PHI
4. James Martin, Computer Database organization. PHI

DISCRETE MATHEMATICS

UNIT-I:

Sets & Preposition –Introduction, combinations of sets, finite and infinite set, unacceptable indefinite sets, principle of inclusion , preposition. Relation and function introduction , a relation models for database . Properties of binary relation .Equivalence relation and lattices , partial ordering relation and lattices . Chain and anti-chain, a job scheduling problem and the pigeonhole principle.

UNIT-II:

Recurrence relation and recursive algorithm – Introduction, Recurrence, relation linear recurrence with coefficients solution, particular solutions, total solutions.

UNIT-III:

Group and ring –group and subgroup , generator and Evaluation of power , Cosets and Lagrange theorem, Permutation , groups and codes , Isomorphism and automorphism , Homomorphism and Normal group , Rings , Integral Domains and Field , Polynomial ring and cyclic codes.

UNIT-IV:

Boolean algebra lattices and algebraic system , principle of duality , basic properties of algebra's of system , defined by lattices , Distributive and complemented lattices , Boolean lattices and Boolean algebra's. Uniqueness finite Boolean algebra's. Boolean function and Boolean Expression, Prepositional Calculus.

UNIT-V:

Finite state machine –introduction, finite state machines, finite state machine as model of physical system, Equivalent machine, finite state Machine as language Recognizer.

Books : Discrete Mathematics By Pragya Publication

ADVANCE CALCULUS & MATRICES

UNIT-I

Derivative as Tangent to a curve , Continuity and differentiability , limit and derivative , derivative of products and composite function , Leibnitz rule and chain rule.

UNIT-II

Expansion of function by Maclaurins's theorem, Taylor's theorem, partial differentiation, total differentiation coefficient, Homogeneous Function, Euler theorem.

UNIT-III

Integral as anti- derivative , integration by part , change of variable , integration of rational and irrational function , definite integral , definite integral as a limit of a sum , application of definite integral to find sum of infinite series.

UNIT-IV

Differential Equation : solution of ordinary differentiation equations ,solution of first order and first degree differential equation , first order and higher degree differential equation, linear differential equation of second order.

UNIT-V

Matrix: Solution of system of linear equation using matrix method , rank of matrix , consistency of the linear system , Eigen value and Eigen vectors.

Books: Advance Calculus & Matrices By Pragya Publication

COMMUNICATIVE ENGLISH

UNIT-I:

Sentence, Part of speech, Adverb and Adjective, Articles, Preposition, Tense, Reported Speech.

UNIT-II:

Modals, Voice: Active and Passive, ,Prieces Writing ,Job Application , Vocabulary, Literature.

UNIT-III:

Noun: Countable, Uncountable, Pronoun: Personal, Relative and other, linking devices , Subject verb agreement , common errors . Adverb and Adverb Phrases, Comparisons and intensification.

UNIT-IV:

Adjective and Adjective phrases, Clauses: Coordinate, Subordinate, relative adverbs. Synonyms Antonyms & Homonyms. Word power, spelling rules, word building, common errors.

UNIT-V:

Developing ability of questions and answers, Body Language and its use in speaking, Technical reports, Group Discussion, interview skills, E-Mail and text message composing.

Books: Communicative English by Pragya Publication

Advanced Concept of Maharishi Vedic Science

(Maharishi Vedic Science – II)

UNIT – I

Classical and Scientific introduction about forty areas of Vedic Science.

UNIT – II

Third Law of Thermodynamics.

Miessener's effect.

Maharish's Effect-Society, Environment, Behavior and effect on moral value.

UNIT – III

Pradhavansabhav, Atantabhav, Annyonabhav, Pragbhav.

Meaning of "Yogastha Kuru Karmani"

Meaning of "Gyanam Chetanayam Nihitam"

UNIT – IV

Theory of Karma-Prarabadha, Kriyamana, Sanchieta.

Theory of Invincibility .

Introduction to Maharishi absolute theory of Government.

UNIT – V

Theory of Ayurved.

Theory of Dincharya & Ritucharya.

Text and Reference Books : -

Maharishi Sandesh Part – I, II

Chetna Vigyan- His Holiness Maharishi Mahesh Yogi Ji.

Dhyan Shailly by Brahmchari Dr. Girish Ji

Visual Basic

UNIT - I

Visual Basic at a Glance: Program Design and Implementation, Introduction to Visual Basic, Hardware and Software Requirements of Visual Basic, Terms Often used in Visual Basic, Programming in Visual Basic, Editing and Writing Code in the Code Window, Programming an Application, **The Integrated Development Environment:** The Visual Basic, ToolBars, Customizing a Toolbar, Menu Bars, The Project Explorer, The Properties Window, The Code Window, The Form Window, The Debug Windows, The Toolbox Window Adding/Removing Custom Controls to the Toolbox, Organizing the Toolbox, Using the Application Wizard, Resource Files, Projects, Form Files, Creating a New Project, Saving the Project, Creating a Project Group.

UNIT-II

The Language Reference: Knowing Visual Basic, Summary of Data Types, Variables, Deftype Statements, User Defined Data Types, Constants, Operators, Control Flow Statements, With-End with Statements, Arrays, **Error Handling, Debugging and Sorting Techniques:** Possibilities of Errors, Using Coding Conventions and Putting Comments, Debugging, Handling Errors, Exit Statements, List of Some Trappable Errors, Sorting Techniques, Implementing Algorithms.

UNIT - III

Object Oriented & Event Driven Programming in Visual Basic: Object Oriented Programming, Objects and Classes, Few Terms Used in OOP, Object Linking and Embedding (OLE), Component Object Model, Creating Object Variables, Creating Control Arrays, Detecting Controls **Forms and Menus:** Form's Basics, Important Properties of Forms, Forms Collection Controlling One Form Within Another - MDI, Using an MDI Form, Menus and the Menu Editor, Pop-Up Menus, Example on Using Pop-Up Menus.

UNIT-IV

Dialog Boxes Displaying, Dialogs Creating a Modal Dialog Box The Message Box, Common Dialog Boxes, The InputBox,

Using Basic Controls: Basic Controls, Introducing Label Control, The Text Box Control, The List Box and Combo Box Controls, Radio Buttons and Check Boxes, Scroll Bars, Example Using Option Buttons, Check Boxes and Scroll Bars, Timer Control Running Lights Application, Creating a Flying-Message Application, Image Control.

UNIT- V

Using Enhanced Controls: The Directory List Box, The Drive List Box, The File List Box, Copying and Searching Files, The Rich Text Box Control, Creating a Preview Document Application, The Key State Control, The Status Bar Control, Progress Bar Control, Slider Control.

New ActiveX Controls: ActiveX Controls, Image List Control, The Toolbar Control, The Coolbar Control, ImageCombo Control, The MonthView Control, The ListView Control, Example Using a ListView Control, TreeView Control, Example Using TreeView Control, Microsoft Masked Edit Controls, _tScrollBar Control, The DateTimePicker Control.

Data Structure Using C

UNIT – I

Introduction to Data Structures: Information and Meaning, Binary and Decimal Integers, Real Numbers, Character Strings, Hardware and Software, Concept of Implementation, Example, Abstract Data Types, Sequences as Value Definitions, ADT for Varying-length Character Strings. Data Types in C, Pointers in C, Data Structures and C, Exercises, Arrays in C, The Array as an ADT, Using One-Dimensional Arrays, Implementing One-Dimensional Arrays, Arrays as Parameters, Character Strings in C, Character String Operations, Two-Dimensional Arrays, Multidimensional Arrays.

UNIT – II

The Stack : Definition and Examples, Primitive Operations, Example, The Stock as an Abstract Data Type, Exercises, Representing Stacks in C, Implementing the pop Operation, Testing for Exceptional Conditions, Implementing the Push Operation, Infix, Postfix, and Prefix , Basic Definitions and Examples, Evaluating a Postfix Expression, Program to Evaluate a Postfix Expression, Limitations of the Program, **Queues and Lists,** The Queue and Its Sequential Representation, The Queue as an Abstract Data Type, C Implementation of Queues, insert Operation, Priority Queue, Array Implementation of a Priority Queue, Exercises, Linked Lists, Inserting and Removing Nodes from a List, Linked Implementation of Stacks, getnode and freenode Operations, Linked Implementation of Queues, Linked List as a Data Structure, Examples of List Operations, List Implementation of Priority Queues, Header Nodes, Exercises, Lists in C, Array Implementation of Lists, Limitations of the Array Implementation, Allocating and Freeing Dynamic Variables, Linked Lists Using Dynamic Variables, Queues as Lists in, Examples of List Operations in C, Noninteger and Nonhomogeneous Lists, Comparing the Dynamic and Array Implementations of Lists, Implementing Header Nodes, Exercises, Example: Simulation Using Linked Lists, Simulation Process, Data Structures, Simulation Program, Exercises, Other List Structures , Circular Lists,Stack as a Circular List, Queue as a Circular List, Primitive Operations on Circular Lists, The Josephus Problem, Header Nodes, Addition of Long Positive Integers Using Circular Lists, Doubly Linked Lists, Addition of Long Integers Using Doubly Linked Lists.

UNIT – III

Trees : Binary Trees, Operations on Binary Trees, Applications of Binary Trees, Exercises, Binary Tree Representations, Node Representation of Binary Trees, Internal and External Nodes, Implicit Array Representation of Binary Trees, Choosing a Binary Tree Representation, Binary Tree Traversals in C, Threaded Binary Trees, Traversal Using a father Field, Heterogeneous Binary Trees, Exercises, Example: The Huffman Algorithm, The Huffman Algorithm, C Program, Exercises, Representing Lists as Binary Trees, Finding the kth Element, Deleting an

Element, Implementing Tree-Represented Lists in C, Constructing a Tree-Represented List, The Josephus Problem Revisited, Exercises, Trees and Their Applications, C Representations of Trees, Tree Traversals, General Expressions as Trees, Evaluating an Expression Tree, Constructing a Tree, Exercises, Example: Game Trees.

UNIT – IV

Sorting, General Background, Efficiency Consideration, Notation, Efficiency of Sorting, Exercises, Exchange Sorts, Bubble Sort, Quick sort, Efficiency of Quick sort, Exercises, Selection and Tree Sorting, Straight Selection Sort, Binary Tree Sorts, Heap sort, Heap as a Priority Queue, Sorting Using a Heap, Heap sort Procedure, Exercises, Insertion Sorts, Simple Insertion, Shell Sort, Address Calculation Sort, Exercises, Merge and Radix Sorts, Merge Sorts, The Cook-Kim Algorithm, Radix Sort.

UNIT – V

Graphs and Their Applications, Applications of Graphs, C Representation of Graphs, Transitive Closure, Warshall's Algorithm, Shortest-Path Algorithm, Exercises, A Flow Problem, Improving a Flow Function, Example, Algorithm and Program, Exercises,

Linked Representation of Graphs, Dijkstra's Algorithm Revisited, Organizing the set of Graph Nodes, Application to Scheduling, C Program, Exercises, Graph Traversal and Spanning Forests, Traversal Methods for Graphs, Spanning Forests, Undirected Graphs and Their Traversals, Depth-First Traversal, Applications of Depth-First Traversal, Efficiency of Depth-First Traversal, Breadth-First Traversal, Minimum Spanning Trees.

System Analysis & Design and MIS

UNIT-I

System Analysis and Design : What is System Analysis and Design (SAD), What Does it Take to do System Analysis?, The Role of a System Analyst, Change in System Analyst's Responsibilities, Responsibilities of System Analysts, **System Development Life Cycle:** System Development Life Cycle (SDLC), Waterfall Model for System Development, Prototyping, The Spiral Model, Problem Identification – Preliminary Investigation

UNIT-II

Feasibility Study : Objective of the Feasibility Study, Types of Feasibility, Steps in Feasibility Study, Cost/Benefit Analysis, **System Analysis :** Need of Analysis, Determination of Requirements, Need of Documenting the Existing System, Fact Finding Techniques **Documentation Tools and Techniques :** Documenting the Existing System, Organization Chart, Decision Tree, Decision Table, Structured English, System Flow Chart, HIPO Chart, Warnier/Orr Diagram, Structure Chart, Programme Flow Chart, Data Flow Diagrams (DFD), Data Dictionary, Entity Relationship Diagram

UNIT-III

System Design: System Design Concept, Logical and Physical Design, Logical and Physical DFDs, System Specifications. **Output Design :** Objective of Output, Types of Output, Key Output Questions, Formats of Outputs, Designing Printed Output, Turnaround Documents, Layout of a Printed Report, Guidelines for Designing Printed Output, Designing Visual Display Output. **Input Design:** Objective of Input Design, Capturing Data for Input, Design of the Source Document, Methods for Data Capture, Input Validation.

UNIT-IV

Modular Design and Database Organization : Modular Design, Principles that Guide Software Design, Top-Down Structure of Modules, Bottom-up Structure, File Structure, File Organization, Database and Its Objectives, Normalization. **Quality Assurance, Testing and Validation:** System Testing Objectives, What Do We Test For, The Nature of Test Data, The Test Plan, Types of System Tests, Quality Assurance.

UNIT-V

Implementation and Maintenance : Conversion, Activity Network for Conversion, File Conversion, User Training, Other Activities in Conversion, System Acceptance and Combating Resistance to Change, Conversion Strategies, Post Implementation Review, Software Maintenance, Type of Software Maintenance. **System Security and Audit :** System Security, Threats to System Security, Risk Analysis, Control Measures, System udit, Protection Against VIRUS.

Computer Networking

UNIT - I

Essentials of Networking: Essentials of Networking (H/W, S/W), USES OF COMPUTER NETWORKS, Business Applications, Home Applications, Mobile Users, Social Issues, NETWORK HARDWARE, Local Area Networks, Metropolitan Area Networks, Wide Area Networks, Wireless Networks, Home Networks, Internet works, NETWORK SOFTWARE, Protocol Hierarchies, Design Issues for the Layers, Connection-Oriented and Connectionless Services, Service Primitives, The Relationship of Services to Protocols.

UNIT - II

REFERENCE MODELS, The OSI Reference Model, The TCP/IP Reference Model, A Comparison of the OSI and TCP/IP Reference Models, A Critique of the OSI Model and Protocols, A Critique of the TCP/IP Reference Model, EXAMPLE NETWORKS , The Internet, Connection-Oriented Networks: X.25, Frame Relay, and ATM, Ethernet, Wireless LANs: 802.11, NETWORK STANDARDIZATION, Who's Who in the Telecommunications World, Who's Who in the International Standards World, Who's Who in the Internet Standards World.

UNIT - III

THE PHYSICAL LAYER : THE THEORETICAL BASIS FOR DATA COMMUNICATION, Fourier Analysis, Bandwidth-Limited Signals, The Maximum Data Rate of a Channel, GUIDED TRANSMISSION MEDIA, Magnetic Media, Twisted Pair, Coaxial Cable, Fiber Optics, WIRELESS TRANSMISSION, The Electromagnetic Spectrum., Radio Transmission, Microwave Transmission, Infrared and Millimeter Waves, Light wave Transmission, COMMUNICATION SATELLITES, Geostationary Satellites, Medium-Earth 0rbit Satellites, Low-Earth Orbit Satellites, Satellites versus Fiber.

UNIT – IV

THE NETWORK LAYER IN THE INTERNET, The IP Protocol, IP Addresses, Internet Control Protocols, OSPF- The Interior Gateway Routing Protocol, BGP- The Exterior Gateway Routing Protocol, Internet Multicasting, Mobile IP, IPv6.

UNIT – V

NETWORK SECURITY :CRYPTOGRAPHY, Introduction to Cryptography, Substitution Ciphers, Transposition Ciphers, One-Time Fads, Two Fundamental Cryptographic principles, SYMMETRIC-KEY ALGORITHMS, DES-The Data Encryption Standard, AES-The Advanced Encryption Standard, Cipher Modes, Other Ciphers, Cryptanalysis, PUBLIC-KEY ALGORITHMS, RSA, Other Public-Key Algorithms, DIGITAL SIGNATURES, Symmetric-Key Signatures, Public-Key Signatures, Message Digests, The Birthday Attack.

Calculus, Differential Equation and Mechanics

UNIT - I

Definition of a sequence. Theorems on limits of sequences. Bounded and monotonic sequences. Cauchy's convergence criterion . Series of non-negative terms. Comparison test, Cauchy's integral test, Ratio test. Raabe's test ,logarithmic test. Leibnitz's theorem. Absolute and conditional convergence.

UNIT – II

Continuity of functions of one variable , sequential continuity. Properties of continuous functions. Uniform continuity. Chain rule of differentiability. Mean value theorems and their geometrical interpretations. Darboux's intermediate value theorem for derivatives. Limit and continuity of functions of two variables.

UNIT –III

Series Solution of Differential Equations-Power series Method, Bessel's Equation Bessel's function and its properties, recurrence and generating relations. Legendre's Equation, Legendre's function and its properties, recurrence and generating relations.

UNIT – IV

Laplace transformations, Linearity of the Laplace transformation, Existence theorem of Laplace transforms, Laplace transforms of derivatives and integrals. Shifting theorem . Differentiation and integration of transforms. Inverse Laplace transforms, Convolution theorem. Applications of Laplace transformation in solving linear differential equations with constant coefficients.

UNIT – V

Analytical conditions of equilibrium of Coplanar forces. Catenary. Forces in three dimensions. Velocities and accelerations along Radial and transverse direction

Text Books:

1. R.R. Goldberg, Real Analysis, I.B.H. Publishing Co. New Delhi, 1970.
2. Gorakh Prasad, Integral Calculus, Pothishala Pvt. Ltd. Allahabad.
3. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & sons, 1999.
4. R.V. Churchill, Fourier series and boundary value problem.
5. S.L. Loney, Statics, Macmillan & Co. London
6. S.L. Loney, An Elementary Treatise on the Dynamics of a Particle and of Rigid Bodies, Cambridge Uni. Press 1956.
7 म.प्र. हिन्दी ग्रंथ अकादमी की पुस्तकें ।

Reference Books:

1. T.M. Apostol Mathematical Analysis Narosa Publishing House New Delhi 1985.
2. Murray R.Spiegel, Theory and Problems of Advanced Calculus, Schaum Publishing Co. New York.
3. N. Piskunov, Differential and Integral Calculus, Peace Publishers, Moscow.
4. S.C. Malik, Mathematical Analysis, Wiley Eastern Ltd. New Delhi.
5. R.S. Verma, A Text Book on Statics, Pothishala Pvt. Ltd., Allahabad.

Advanced Calculus, Partial Differential Equations, Complex Analysis and Abstract Algebra

UNIT – I

Partial differentiation. Change of variables. Euler's Theorem on homogeneous function, Taylor's theorem for functions of two variables. Jacobians, Envelopes, Evolutes.

UNIT – II

Maxima, minima and saddle points of functions of two variables. Beta and Gamma functions. Double and triple integrals. Dirichlet's integrals.

UNIT – III

Partial Differential equations of the first order. Lagrange's solution. Some special types of equations which can be solved easily by methods other than general methods. Charpit's general method of solution, Partial differential equations of second and higher orders. Homogeneous and non- Homogeneous equations with constant coefficients. Partial differential equations reducible to equations with constant coefficients.

UNIT – IV

Complex numbers as ordered pairs. Geometric representation of Complex numbers, Continuity and differentiability of Complex functions. Analytical function, Cauchy Riemann equation, Harmonic function, Mobius transformations, fixed point, cross ratio.

UNIT – V

Group-Automorphisms, inner automorphism. Group of Automorphism, Conjugacy relation and centraliser. Normaliser. Counting principle and the class equation of a finite group. Cauchy's theorem for finite abelian groups and non abelian groups. Ring homomorphism. Ideals and Quotient Rings.

Text Books :

1. Gorakh Prasad, Differential Calculus, Pothishala Pvt. Ltd. Allahabad.
2. Gorakh Prasad, Integral Calculus, Pothishala Pvt. Ltd. Allahabad.
3. I.N. Sneddon, Elemets of partial Differential equatiins Mc graw Hill, Co. 1988
4. Shanti Narayan, Theory of Functions of a Complex Variable, S. Chand & Co., New Delhi.
5. I. N. Herstein Topics in Algebra, Wiley Eastern Ltd., New Delhi, 1975.
6 म.प्र. हिन्दी ग्रंथ अकादमी की पुस्तकें ।

Reference Books:

1. T.M. Apostol, Mathematical Analysis Narosa Publishing House, New Delhi 1985
2. Murray R. Spiegel, Theory and Problems of Advanced Calculus, Schaum Publishing o., New York
3. N. Piskunov , Differential and Integral Calculus, Peace Publishers, Moscow.
4. S.C. Malik, Mathematical Analysis, Wiley Eastern Ltd., New Delhi.
5. N. Jacobson, Basis Algebra, Vols, I & II. W.H. Freeman, 1980 (also published by Hindustan Publishing Company.)
6. Shanti Narayan, A Text Book of Modern Abstract Algebra, S. Chand & Co. New Delhi

Communicative Hindi

यूनिट–1

हिन्दी भाषा का संक्षिप्त विकास, हिन्दी के लिपि एवं बोलियों का संक्षिप्त परिचय, शब्दकोश – उपयोग एवं महत्व , हिन्दी व्याकरण, शब्द रचना, वाक्य रचना, वाक्यों के प्रकार, उपवाक्य संधि समास, उपसर्ग, प्रत्यय, प्र्यायवाची विलोमार्थी अनेकार्थक, समूहार्थक शब्द ।

यूनिट–2

देवनागरी लिपि के मुख्य विशेषताऐं वर्तनी, शब्द शुद्धि एवं वाक्य शुद्धि के नियम, प्रमुख मुहावरो एवं लोकोक्तियों का प्रयोग, छंद एवं अलंकारों का उपयोग, विराम चिन्हों का उपयोग।

यूनिट–3

गद्य को विभिन्न शैलियॉ, साहित्य एवं समाचार पत्रों की भाषा शैली, वर्ण विभाग, स्वर व्यंजन , शब्द विभाग :– संजा, सर्वनाम, विश्लेषण क्रिया, संबंध बोधक समुच्चय बोधक, विस्मययि बोधक । वाक्य विभाग :– उद्देश्य और विधेय, काल और काल अभेद पुरूष, वचन, लिंग ।

यूनिट–4

अनुवाद का अर्थ और परिभाषा, अनुवाद के प्रकार, अनुवाद के उपकरण एवं समस्या, भाव तथा प्रभाव के आधार पर अनुवाद एवं लेख।

यूनिट–5

निबंध लेखन, रिपोर्ट लेखन, पत्र लेखन, अनुवाद, गोदान ,गवन . मुंशीप्रेमचंद।

TEXT & REFERENCE BOOKS:

- अनुवाद विकास एवं संपेषण :– डॉ. हरिमोहन
- अनुवाद कला सिद्धांत और प्रयोग :– डॉ कैलाश भाटिया
- व्यवहारिक हिन्दी :– डॉ. माखेन्द्र पाठक
- परिष्कृत हिन्दी व्याकरण :– बदरीनाथ

INTRODUCTION TO OPERATING SYSTEM

UNIT - I

Introduction to Operating Systems: What is an Operating System? Evolution of Operating Systems, Operating System Structure, Different Views of the Operating System, Design and Implementation of Operating Systems. **The Concept of Process** :Process, Implicit and Explicit Tasking, Process Relationship, Process State, Process. Control Block, Process Scheduling, Context Switch, Operations on Process, Operating-System Services for Process Management, Threads, Interprocess Communication.

UNIT – II

CPU Scheduling: Basic Concepts, CPU-I/O Burst Cycle, Scheduling, Types of Schedulers, Dispatcher, Scheduling Criteria, Multiple -level Scheduling, Real-Time Scheduling, Algorithm Evaluation, **Process Synchronization:** The Critical-section Problem, Synchronization Hardware**,** Semaphores, Classical Problems of Synchronization, Critical Region, Monitors, Atomic Transactions. **Deadlocks**: System Model, Deadlock Characterization, Methods For Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Dead lock Detection, Recovery from Deadlock, **Memory Management**: Background, Logical Versus Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation, **Virtual Memory**: Background, Demand Paging, Performance of Demand Paging, Page Replacement, Page Replacement Algorithms.

UNIT – III

File Systems: Files, Directories, File System Implementation, **Security and Protection**: Security Threats and Goals, Penetration Attempts, Security Policies and Mechanisms, Authentication, Protection and Access control, Cryptography. **Multiprocessor Systems:** Background, Motivation and Classification, Multiprocessor Interconnections, Types of Multiprocessor Operating Systems, Multiprocessor OS Functions and Requirements, Introduction to Parallel Programming, Multiprocessor Synchronization, **Network Structures:** Background, Motivation, Topology, Network Types.

UNIT – IV

Distributed System Structure: Background, Motivation, Topology, Network Types, Communication, Design Strategies, **Distributed File Systems:** Background, Naming and Transparency, Remote File Access, File Replication, **Distributed Coordination:** Event Ordering, Mutual Exclusion, Atomicity, Deadlock Handling, Performance Measurement, Monitoring and Evaluation, Background, Need for Performance Monitoring and Evaluation, Performance Measures, **Performance Evaluation Techniques**:
Bottlenecks and Saturation

UNIT – V

Introduction to Linux Operating System: Features of Linux, Drawbacks of Linux, Components of Linux, Memory Management Subsystems, Linux Process and Thread Management, File Management System, Device Drivers. **Linux Commands and Utilities:** Entering the Machine, User Names and Groups, Logging In, Correcting Typing Mistakes, Format of Linux Commands, Changing Your Password, Characters with Special Meanings, Linux Documentation, The File System, Current Directory, Looking at the Directory Contents, Absolute and Relative Pathnames, Some Linux Directories and Files.

Linux Utilities and Editor: Some Useful Commands, Permission Modes and Standard Files, Pipes, Filters and Redirection, Shell Scripts, Graphical User Interface, Editor. **User-to-User Communication:** On-Line Communication, Off-Line Communication, Apache Server Settings, Network Server Settings, Domain Name Server, Network File Server.

UNIX System Administration: System Administration, Installing Linux, Choosing an Installation Method, Choosing an Installation Class, Pre-installation checks, Installation, Booting the System, Maintaining User Accounts, File Systems and Special Files, Backups and Restoration.

Text Books:-

1. Operating System Concept (IVth ed.) by Silbersantz and Galvin (Addition Wesly)

Reference Books :-

1. Operating system Principles By P. B. Hansen, P.H.I.
2. An introduction to operating system design N. Haberman, Galgotia publication

Core Java

UNIT - I

The Genesis of Java, Introduction and Creation, Applets and Applications, Security, Bytecodes, Java Buzzwords, Simple, Multi-threaded, Architecture Neutral, Java and Java Script, New in JDK, An Overview of Java, What is an Object, Features of Object Oriented Programming, The First Simple Programme, Compiling, Data Types, Variables and Arrays, Data Types in Java, Literals, Characters, Variable Declaration, Symbolic Constants, Type Casting, Arrays, Vectors, Array Declaration Syntax, Operating in Java, Arithmetic Operators, Basic Assignment Operators, Relational Operators, Boolean Logical Operators, Ternary Operator, Operator Precedence, Control Statements, Java's Selection Statements, Switch, Nested Switch, Iteration Constructs, Continue, Return.

UNIT - II

Class an Introduction, What is a Class, What are Methods, Methods and Classes in Details, Methods Overloading, Constructor Overloading, Objects as Parameters, Returning objects, Recursion, Access Control! Visibility, Understanding Static, Final, Nested and Inner Classes, The String Class, Command Line Arguments, Inheritance, Inheritance Basic, Member Access and Inheritance, Super Class Variable and Sub Class Object, Using Super to Call Superclass Constructors, Another Use of Super, Multilevel hierarchy, Calling Constructor, Overriding Methods, Abstract Classes Method, Final and Inheritance, Object Class.

UNIT - III

Interfaces and Packages, Defining Interface, What is a Package, Classpath Variable, access Protection, Important Packages, Exception Handling, Fundamentals of Exception Handling, Types of Exceptions, Uncaught Exceptions, Try and Catch Keywords, Throw, Throws and Finally, Nested Try Statements, Java Built in Exceptions, User Defined Exceptions.

Multithreaded Programming, The Java Thread Model, Priorities, Synchronization, Messaging, Thread Class and Runnable Interface, Creation of Threads, Creating Multiple Threads, Synchronization and Deadlock, Suspending, Resuming and Stopping Threads.

UNIT - IV

Applets and Input Output, Input/Output Basics, Streams (Byte and Character), Reading From and writing to Console, Reading and Writing Files, Printwriter Class, Fundamentals Of

Applets, Transient and Volatile Modifier, Strictfp, Native Methods, Problems with Native Methods, Handling Strings, String Length, Operations on Strings, Extract Character Methods, String Comparison Methods, Searching and Modifying, Data Conversion and Value of 0 Methods, Changing Case of Characters, String Buffer, Exploring Java. Lang, Wrapper Classes and Simple Type Wrappers, Void, Abstract Process Class, Runtime Class and Memory Management, Other Programme Execution, System Class, Environment Properties, Using Clone 0 and Clonable 0 Interface, Class and Class loader, Math Class, Thread, Thread Group and Runnable Interface, Throwable Class, Security Manager, The java. lang. ref and java. lang. reflect packages, Java..Util-The Utility Classes, The Enumeration Interface, Vector, Stack, Dictionary, Hash table, Properties, Using Store 0 and Load 0, String Tokenizer, Bit set Class, Date and Date Comparison, Time Zones, Random Class, Observe.

UNIT - V

Input Output Classes, File in Java, Directory, File Name Filter Interface, Creating Directory, The Stream Classes, Input Stream and Output Stream, File input Stream and File Output Stream, Byte Array Input Stream and Byte Array Output Stream, Filtered Byte Stream, Buffered ByteStream, Print Stream, Random Access File, Stream Tokenizer, Stream Benefits, **Networking,** Basic of Networking, Proxy Server, Domain Naming Services, Networking Classes and Interfaces, InetAddress Class, TCP/IP Sockets, Datagram Packet, Networth, **Applet** Class, Applet Basics, Applet Life Cycle, A Simple Banner Applet, Handling Events, getDocumentBaseO, getCodeBaseO, showDocumentBaseO, Audio Clip and Applet Stub interface.

Software Engineering and Web Page Designing

UNIT - I

Introduction to Software and Software Engineering: The Origin of Software Engineering, Characteristics of Software Engineering, Software Crisis. Software Engineering: Models: Life Cycle Model, Spiral Model, Models of the Software Process.

Software Engineering Methodologies: Software Process, Software Metrics, Configuration Management Issues: Organizing the Process.

UNIT- II

Software Requirement Analysis and Specification: Requirements Definition, Nonfunctional Requirements Definition, Formal Specification, Algebraic Specification, Model-based Specification, Z Schemas, Specification using Functions, Specification using Sequences, Validation, The Prototyping Process, Prototyping Techniques.

UNIT- III

Principles of Software Project Management: Principles of Software Project Management, Principles or Laws of Project Management, Software Project and Personnel Planning, Cost Estimation of Building a System, Software Metrics, The Project Plan, Resource Tracking and Stimulation Example, Quality Assurance Planning, Risk Analysis .

UNIT-IV

Introduction to www, what is www, Introduction to website, website structure, Uniform resource locator, home page Browser, uses of web site, Web site hosting, Registration process of domain name languages of web.

HTML-Creating HTML Documents, Title and Headings, Paragraphs Linking to other Documents Relative Links versus Absolute Pathnames Links to Specific Sections in Documents Unnumbered Lists Numbered Lists Definition Lists Nested Lists Preformatted Text ,Text Tags Animated GIF Images Image Alignment Using an Image as Hypertext Link Embedding sound and video Frames.

UNIT - V

JavaScript Introduction JavaScript Basics What We Can Do with JavaScript Embedding JavaScript in HTML Functions Using the JavaScript Console Using JavaScript Objects

Window Methods Handling Events Using the Status Bar Validating Form Input Using Windows and Frames Creating a Frame Using JavaScript URLs javascript examples(programs).

Active Server Pages (ASP) Introduction to ASP technologies Asp objects ActiveX components Vbscript Vbscript functions Working with databases HTTP status codes error codes Example of asp programms.

Data Warehousing and Data Mining

UNIT - I

Data Warehousing: Introduction, What is a data warehouse? Delivery Process: Introduction, Data warehouse delivery method.

UNIT - II

System Processes: Introduction, typical process flow within a data warehouse, Extract and load process, clean and transform data, backup and archive process, query management process.

Process Architecture: Introduction load manager, warehouse manager, query manager, detailed information, summary information, metadata, data marting.

UNIT - III

Database Scheme : Introduction, star flake schemas, identifying facts and dimensions, designing fact tables, designing dimension tables, designing the starflake schema, query redirection, multidimensional schemas.

Partitioning Strategy: Introduction, Horizontal partitioning, Vertical Partitioning, Hardware partitioning, Which key to partition by? Sizing the partition.

Aggregations: Introduction, Why aggregation?, what is an aggregation? Designing summary tables, which summaries to create.

UNIT - IV

Metadata: Introduction, data transforming and load, Data management, Query generation, Metadata and Tools.

System and Data Warehouse Process Managers: Introduction, Why you need tools to manage a data warehouse, System managers, Data warehouse process managers, load manager, Warehouse manager, query manager.

UNIT - V

Data Mining: Introduction, data mining, data mining versus query tools, data mining in marketing, practical applications of data mining. What is learning?, Integration with data.

Real Analysis, Linear Algebra and Discrete Mathematics

UNIT – I

Riemann integral, Integrability of continuous and monotonic functions, The fundamental theorem of integral calculus, Mean value theorems of integral calculus, Partial derivatives and differentiability of real-valued functions of two variables.

UNIT – II

Schwarz and Young's theorem, Implicit function theorem, Fourier series of half and full intervals, Improper integrals and their convergence, Comparison test, Abel's and Dirichlet's tests, Frullani's integral, Integral as a function of a parameter.

UNIT – III

Definition and examples of vector spaces, subspaces, Sum and direct sum of subspaces. Linear span, Linear dependence, independence and their basic properties. Basis, Finite dimensional vector spaces, Existence theorem for basis, Invariance of the number of elements of a basis set, Dimension, Dimension of sums of vector subspaces.

UNIT – IV

Linear transformations and their representation as matrices, The Algebra of linear transformations, The rank- nullity theorem, Eigen values and eigen vectors of a linear transformation, Diagonalisation. Quotient space and its dimension.

UNIT – V

Binary Relations, Equivalence Relations, Partitions and Partial Order Relation . Graphs, Multigraphs, Weighted Graphs, Paths and Circuits, Shortest Paths. Trees and their properties.

Text Books :

1. R.R Goldberg, Real Analysis, Oxford & IBH Publishing Co., New Delhi, 1970.
2. Shanti Narayan, Theory of Functions of a Complex Variable, S. Chand & Co., New Delhi.
3. K. Hoffman and R. Kunze, Linear Algebra, 2nd Edition. Prentice Hall Englewood Cliffs,New Jersey.1971.
4. C.L. Liu,Elements of Discrete Mathematics, (Second Edition), McGraw Hill, International Edition, Computer Science scries 1986.
6. Narsingh Deo : Graph Theory, McGraw Hill.
7. म.प्र. हिन्दी ग्रंथ अकादमी की पुस्तकें ।

REFERENCE BOOK:-

1. T.M Apostol, Mathematical Analysis. Norosa Publishing House. New Delhi, 1
2. S. Lang. Undergraduate Analysis, Springer-Veriag, New York, 1983.
3. D. Somasundaram and B. Choudhary, A first Course in Mathematical Analysis. Narosa Publishing House, New Delhi 199 /.
5. Shanti Narayan, A Course of Mathematical Analysis. S. Chand & Co. Delhi.
6. RK. Jain and S.K. Kaushik, An introduction to Real Analysis, S. Chand & Co., New Delhi. 2000.
7. R. V. Churchill & J.W. Brown, Complex Variables and Applications, 5th Edition, McGraw-Hili New. York. 1990
8. Mark; J. Ablowitz & A. S. Fokas. Complex Variables : Introduction and Applications, Cambridge University Press, South Asian Edition, 1998
9. Ponnuswamy : Complex Analysis, Narosa Publishing Co.
10. Babu Ram, Discrete Mathematics, Vinayak Publication.
11. K.B. Datta. Matrix and Linear Algebra, Prentice hall of India Pvt Ltd., New Delhi, 2000.
12. S.K. Jain, A. Gunawardena & P.B. Bhattacharya. Basic Linear Algebra with MATLAB Key college Publishing (Springer-Verlag) 2001
13. S. Kumarsaran, Linear Algebra, A Geometric Approach Prentice – Hall of India, 2000

Metric Spaces, Numerical Analysis and Elementary Statistics

UNIT-I

Definition and examples of metric spaces. Neighbourhoods. Limit points. Interior points. Open and closed sets. Closure and interior. Boundary points. Subspace of a metric space. Cauchy sequences. Completeness, Cantor's intersection theorem, Contraction principle. Real numbers as a complete ordered field. Dense subsets. Baire Category theorem. Separable, first and second countable spaces.

UNIT – II

Continuous functions. Extension theorem. Uniform continuity. Compactness, Sequential compactness. Totally bounded spaces, Finite intersection property. Continuous functions and compact sets. Connectedness

UNIT – III

Solution of Equations: Bisection. Secant, Regula Falsi. Newton, Method. Roots of second degree Polynomials, Interpolation, Lagrange interpolation, Divided Differences, Interpolation formulae using Differences, Numerical Quadrature, Newton-Cote's Formulae, Gauss Quadrature Formulae.

UNIT – IV

Linear Equations: Direct Methods for Solving Systems of Linear Equations (Guass elimination, LU Decomposition. Cholesky Decomposition), Iterative methods (Jacobi. Gauss - Seidel Reduction Methods). Ordinary Differential Equations: Euler Method, Singlestep Methods, Runge-Kutta's Method, Multi-step Methods, Milne-Simpson Method. Methods Based on Numerical Integration, Methods Based on numerical Differentiation.

UNIT – V

Measures of dispersion-range, inter quartile range, Mean deviation, Standard deviation, moments, skewness and kurtosis. Probability, Continuous probability, probability density function and its applications (for finding the mean, mode, median and standard deviation of various continuous probability distributions) Mathematical expectation, expectation of sum and product of random variables. Theoretical distribution- binomial, Poisson distributions and their properties and use, Moment generating functions.

Text Books :

1. R.R Goldberg, Real Analysis, Oxford & IBH Publishing Co., New Delhi, 1970.
2. G.F. Simmons. Introduction to Topology and Modem Analysis. McGraw-Hill, 1963.
3. म.प्र. हिन्दी ग्रंथ अकादमी की पुस्तकें ।
4. V Raja raman Programing C, Prentice Hall cf India, 1994.
5. C E Frooerg. Introduction to Numerical Analysis, (Second Edition L Addison-Wesley - 1979,

Reference Books:

1. T.M Apostol, Mathematical Analysis. Norosa Publishing House. New Delhi, 1 985
2. S. Lang. Undergraduate Analysis, Springer-Veriag, New York, 1983.
3. D. Somasundaram and B. Choudhary, A first Course in Mathematical Analysis. Narosa Publishing House, New Delhi 1997.
4. Shanti Narayan, A Course of Mathematical Analysis. S. Chand & Co. Delhi.
5. RK. Jain and S.K. Kaushik, An introduction to Real Analysis, S. Chand & Co., New Delhi 2000.
6. P.K. Jain and K. Ahmed Metric Spaces, Narosa Publishing House, New Delhi, 1996.
7. S. Lang, Undergraduate Analysis, Springer-Verlag, New York 1983.
8. E.T. Copson, Metric Spaces, Cambridge University Press, 1968
9. Henry, Mullish and Herbert, L. Copper, Spirit of C: An Introduction to Modern Programming, Jaico Publishers.
10 M K Jain, S.R.K. Iyengar, R. K. Jain. Numerical Methods Problems and Solutions, New Age International (P)Ltd. 1996.
11. E. Balaguruswamy- Numerical Method Tata Mc Graw_ Hill Pub.Com. New Yark.
1. Statistics by M. Ray
2. Mathematical Statistics by J.N. Kapoor, H.C. Saxena (S. Chand)
3. Fundamentals of Mathematical Statistics, Kapoor and Gupta

Science of Communication and E – Commerce

UNIT- 1

Introduction to communication theory, the fact of communication, Communication -Definition, Nature, Scope, Purpose. Process of Communication. Functions of Communication, Uses of Communication, The needs of communication, Communication and information, Communication and Languages. Definition and elements of human communication, Socialization and role of communication in Socialization Types of communication, Intrapersonal communication, Interpersonal communication, Focused and unfocused interactions, group communication, mass communication, Interactive communication ,Public Communication ,Corporate communication.

UNIT- II

Verbal communication, Non verbal communication, Importance of body language, Appropriate Body Postures ,Oral communication, Written communication, Visual communication, Signs ,Symbols and code system, communication skills , Dress code . Barriers of communication, Physical barriers of communication, Psychological barriers of communication, Linguistic and cultural barriers of communication, Mechanical barriers of communication, Removal of barriers.

UNIT- III

Group communication: Types of Group discussion, Theories and Models, Decision making process, Leadership, Team work communication, Leadership skill Development, Group Discussion, Written Communication skills.

Introduction to E-Commerce: Definition and scope of E-Commerce and M-Commerce, E-Commerce trade cycle, Electronic Markets, Internet Commerce, Benefits and Impacts of E-Commerce.

Elements of E-Commerce: Various elements, e-visibility, e-shops, Delivery of goods and services, Online payments, After - sales services, Internet E-Commerce security.

UNIT – IV

EDI and Electronic Payment Systems: Introduction and definition of EDI, EDI layered Architecture, EDI technology and standards, EDI communications and transactions, Benefits and applications of EDI with example, Electronic Payment Systems: credit/debit/smart cards, e-credit accounts, e-money.

Introduction to EC models: Inter-organization and intra-organization E-Commerce, E-Commerce Models: B2B, B2C, C2B, C2C, G2C, C2G.

E-Business: Introduction to Internet bookshops, Grocery Suppliers, Software Supplies and support, Electronic newspapers, Virtual auctions, Online share dealing, e-diversity.

UNIT – V

E-Security and Legal Issues: Security concerns in E-Commerce, Privacy, integrity, authenticity, non-repudiation, confidentiality, SSL, Digital Signatures and fire walls, IT Act 2000,Cyber crimes and cyber laws.

E-Security and Legal Issues: Security concerns in E-Commerce, Privacy, integrity, authenticity, non-repudiation, confidentiality, SSL, Digital Signatures and fire walls, IT Act 2000,Cyber crimes and cyber laws.

Mobile Commerce and Future of E-Commerce: Introduction to Mobile Commerce, Benefits of Mobile Commerce, Impediments of M-Commerce, M-Commerce framework, Emerging and future trends. Case Study.

TEXT & REFERENCE BOOKS:

- MASS COMMUNICATION IN INDIA BY KEVAL J. KUMAR - A JAICO BOOK
- COMMUNICATION MOSAICS: AN INTRODUCTIONTO THE FIELD OF COMMUNICATION, 2001. BY WOOD, JULIA T, WADSWORTH
- FRONTIERS OF ELECTRONIC COMMERCE, BY- KALAKOTA, RAVI; STONE TOM; WHINSTON, ANDREW B, ADDISON WESLEY PUBLISHING CO, ISBN 8178080575
- E-COMMERCE AN INDIAN PERSPECTIVE BY P. TJOSEPH, S.J. PRENTICE-HALL OF INDIA