= SYLLABUS =

BACHELOR IN COMPUTER APPLICATION (BCA)

Sub.code	Subject	Max. Marks. Univ.+ Mid Semi	Duration of Univ.Exam
First Semester			
Theory Paper:-			
1.1	Mathematics- I	80 + 20	3 hrs.
1.2	English	80 + 20	3 hrs.
1.3	Basic Electronics	80 + 20	3 hrs.
1.4	Computer Fundamentals	80 + 20	3 hrs.
1.5	Programming Technique and C Programming	80 + 20	3 hrs.
Practical Paper:-			
1.6	C Programming and Information Technology	100 + 50	3 hrs
Second Semester			
Theory Paper:-			
2.1	Mathematics - II	80 + 20	3 hrs
2.2	Computer Organization and Architecture	80 + 20	3 hrs
2.3	Data Structure using C	80 + 20	3 hrs
2.4	Digital Electronics	80 + 20	3 hrs
2.5	Introduction to Discrete Mathematical Structure	80 + 20	3 hrs
Practical Paper:-			
2.6	Data Structure Using C' Programming C, Computer Fundamentals.	100 + 50	3 hrs
Third Semester			
Theory Paper:-			
3.1	Operating Systems	80 + 20	3 hrs
3.2	Probability & Statistics	80 + 20	3 hrs
3.3	Data Processing & File Structure	80 + 20	3 hrs
3.4	Numerical Analysis and FORTRAN Programming	80 + 20	3 hrs
3.5	Computer Graphics	80 + 20	3 hrs

Practical Paper :-

3.6	UNIX, Windows NT, Numerical & Statically Computing.	100 + 50	3 hrs

Sub.code	Subject	Max. Marks. Univ. + Mid Semi	Duration of Univ.Exam

Fourth Semester

Theory Paper:-

4.1	Data Communication, and Computer Networks	80 + 20	3 hrs
4.2	Internet Technology and & Application-I	80 + 20	3 hrs
4.3	Object Oriented Programming with C++.	80 + 20	3 hrs
4.4	Accounting	80 + 20	3 hrs
4.5	Data Base System	80 + 20	3 hrs

Practical Paper:-

4.6	DBMS and C++.	100 + 50	3 hrs

Fifth Semester

Theory Paper:-

5.1	Internet Technology & Application – II	80 + 20	3 hrs
5.2	Combinatory & Graph Theory	80 + 20	3 hrs
5.3	Business Practices	80 + 20	3 hrs
5.4	Technical Documentation, Presentation and Communication Skill	80 + 20	3 hrs
5.5	Visual and Windows Programming	80 + 20	3 hrs

Practical Paper :-

5.6	Java & Internet Programming	100 + 50	3 hrs

Sixth Semester
Theory Paper:-

6.1	**Information System, Analysis Design & Implementation**	**80 + 20**	**3 hrs**
6.2	**Multimedia & Applications**	**80 + 20**	**3 hrs**
6.3	**Software Engineering**	**80 + 20**	**3 hrs**
6.4	**Network Programming**	**80 + 20**	**3 hrs**

Practical Paper:-

6.5	**Network Programming**	**70 + 30**	**3 hrs**
6.6	**Project**	**100 + 50**	**3 hrs**

PAPER – 1.1 MATHEMATICS – 1

Unit – I: First Order Differential Equation: Basic concept. Separable equation & modeling, Exact Differential Equation Integrating factors. Linear differential equations & modeling. orthogonal trajectories of curve.

Unit - II: Second Order Linear Differential Equation: Homogenous linear equation. Homogenous equation with constant coefficients & modeling. Differential operators. Euler-Cauchy equations. Wroosian- Homogeneous equations. Solution by undermined coefficients & variation of parameters. Modeling.

Unit- III: Higher Order Linear Differential Equation: Homogeneous linear systems with constant coefficients and variation of parameters.

Unit - !V: Linear Algebra – I: Basic concepts, Operation on matrices, Linear systems of equation vector spaces, Linear independence & basis, rank and inverse of a matrix. Determinants, Linear transformation.

Unit - V: Linear Algebra – II: Eigenvalue Eigenvectors & application. Symmetric, Skew –Symmetric Orthogonal,Hermitian Skew-Hermitian and Unitary matrices. Digitalization, Quadratic forms and application to conic sectors.

BOOKS RECOMMENDED:

1. Erwin Kteyszig : ADVANCED engineering Mathematics (7th Edition) John Wiley and sons. (Nop :10-IT) Chapter: 1. (Excluding 1.10 & 1.11),
   Chapter: 2 (excluding 2.13)
   Chapter: 3, chapter – 4, (excluding4.6) Ch.7.

2. J.Sinlaray & S. Padhy – Acourse on ordinary and partial differential equations, Kulyani Publishers (Ch. 1,2,3 (Nop : 30-IT)

V.Krishnamurthy, V.P.Mainra, J.L.Arora – Linear ALGEBRA, affiliated East – west Press.(Nop :12-IT)

PEFERENCE: M.C.Potter, J.Goldberg – Mathematical Methods, Prentice Hall of India.

PAPER 1.2: ENGLISH

UNIT – I: Prose

UNIT – II: Novel

UNIT – III: One General Essay

UNIT – IV: Précis Writing

UNIT – V: Grammars

UNIT – VI: Comprehension writing

BOOKS RECOMMENDED:

Prose:

1. Mosaic: Modern English Prose – Editor V.A.Shahame (Macmillon 1978 Edition) Chapter – 1,2,3,5, 8, 9, 11 (NOP :30-IT)
2. Twentieth Century Prose – V.Satithithanandan (Macmillon) Chapter – 1,2,9,12(NOP : 8-IT)

Novel:

3. Cakes and Ale: W.Somerset Maugham – Retold by Margmy Green
4. The Corel Island: R.N.Bailantyne – Simplified and abridged by einter bottom and Winter bottom. (Nop : 17-IT)

PAPER- 1.3: BASIC ELECTRONICS

UNIT- I: Atomic Structure Energy bands in solid p +and n- type semiconductor, pn-junction, Semiconductor diode, Zener diode & use of diodes.

UNIT – II: Transistors, Transistor connections and biasing, single stage transistor amplifiers.

UNIT – III: Multistage transistor amplifier, Feedback amplifier, Oscillators.

UNIT – IV Field effect transistors, Silicon controlled rectifier, Triac, Diac and UJT

UNIT- V Solid state switching circuits, Regulated power supply, Idea of simple electronic measuring instruments,

BOOKS RECOMMENDER:

1. B.B.Swain : A.Text Book of Electronic, Kitab Mahal,(Nop : 8-6th Front)
2. V.K.Mehta: Principles of Electronics : S.Chand & Co.Ltd. (NOP : 39-6th Front)
3. B.L.Thereja: Basic Electronics: S.Chand & Co.Ltd.

REFERENCE:

1. J.Millman and C.C.Halkias: Integrated Electronics: Mc.Graw Hill International Edition.

PAPER - 1.4 COMPUTER FUNDAMENTALS

UNIT – I Computer Basic & Data Representation: Basic structure and functions of a computer. Elementary idea of algorithm and computer program. Concept of stored programmed execution, Characteristics of computer, Data Processing in computer, Binary octal and hexadecimal numbers and their introversion,. ASCII and EBCDIC codes. Boolean operation, Logic gates and truth tables.

UNIT – II Memory and I/O Unit : Memory hierarchy, Serial access and Random access memory, Memory cell, memory organization, Secondary storage: Hard Disk, Floppy disk, CD – ROM and Magnetic tape , Description of various input and output devices.

UNIT – III Computer Architecture, Operating System and Languages: Interconnection of Processor with other units, Structural components of CPU and their functions, instruction Execution, Interrupt structure, Multiprogramming Functions of operating systems, Basic knowledge of various types operating systems. Types of languages, Machine code, Assembly language, High level Languages, Compiler and Interpreter.

UNIT – IV Evolution and Classification of Computers: First, second, third, fourth and fifth generation of computer, Microcomputer, Evolution of Parallel computer, Special purpose computer and their applications.

UNIT – V: Importance of information and use of computer for information processing, communication with and among Computers, Goals of computers network, Internet and *WWW,* networks, Applications of computer to specific research, business applications, industrial applications, Defense, Weather forecasting, Space applications, Use in Law, medicine & education.

UNIT – VI : DOS: MS DOS Internal commands and external commands, configuring DOS Creation and use of batch files.
Windows: Windows Basic, Windows Accessories, File Manager, and Programmed Manager.

BOOK RECOMMENDED:

1. V.Rajaraman: Fundamentals of Computers, Prentice-Hall of India, (Third Edition)(NOp: 20-IT)
2. P.K.Sinha: Computer Fundamentals, BPB Publications (Nop : 25-IT)

REFERENCES:

1. D.P.Curlin, K.Foley, K.Sen, C.Morin: Information Technology, Tata Mc Graw Hill Edition
2. Reger Hint and John Shelly: Computer and Commonsense. Prentice- Hall of India
3. J.P.Hayes and John Shelly: Computer Architecture and Organization (Mc.Graw Hill International Edition.

PAPER – 1.5 : PROGRAMMING TECHNIQUE & C PROGRAMMING

UNIT – I Introduction of problem solving: Problem solving aspect, Top Down design, Implementation of algorithms, program verification, efficiency of algorithms, Analysis of algorithm.

UNIT – II: Type, Operators, Expression and Control Flow: Variables names, Data Types and sizes, Constants, Declarations, Arithmetic operators, relational and Logical operators. Types conversions, Increment and Decrement operators, Bitwise Logical operators, Assignment operators and expressions, Conditional expressions, Precedence and order of evaluation. Statement and blocks, if-else, Else-if switch, while and for loops, Do-while loops, break and continue, go to labels.

UNIT – III: Functions and Programmed Structures: Basics of Functions, Functions returning non-integers, External variables Scope rules, Header files, Static variab1cs, Register variables, Block structure, Initialization, Recursion, The C preprocessor.

UNIT – IV: Pointers and Arrays: Pointers and addresses, pointers and function arguments, Pointers and arrays, Address arithmetic, Character pointers and functions, Pointer arrays Pointers to pointers, Multidimensional arrays, Initialization of Pointer arrays, Pointer Vs Multi – dimensional arrays, Command- line arguments, Pointer to functions.

UNIT – V: Structures and I/O: Basic of Structures, Structures and functions, Arrays of structures, Pointers to structures, Self-referential structures, Table lookup, Typeset, Unions and bit fields,

Input and output: Standard input and output, formatted output-print f, Variable length argument lists, formatted input-scarf, File access, File descriptor, Low level I/O – Read and Write. Open, Create, Close, Unlink, Random access Sleek.

BOOKS RECOMMENDED:

1. R.G.Dromey: How to solve it by Computers, PHI New Delhi.
2. B.W.Kernighan & D.M.Ritchie: The C Programming Language.

REFERENCE:

1. Balaguruswamy: The C Programming Language, THM.(Nop : 30-6th)
2. Golfiled: The C Programming Language, Schaum series,

PAPER 1.6: C PROGRAMMING AND INFORMATION TECHNOLOGY

SEMISTER – II

PAPER – 2.1: MATHEMATICS – II

UNIT- I: Convergence of sequence and series: Concept of convergence. Limit theorem, weierstrass completeness principle, subsequences and Boltzman weierstrass theorem. cauchy's general principle of convergence, limit superior & limit inferior, complex sequences, convergence of series, series of positive terms, absolute convergence. Conditionally convergent series. Power series.

UNIT - II: Series solution of differential equation & special functions: Power series method. Legendre's equation and Legendre Polynomial, Probenius Method, Bessel's Equation and Bessel's function of first and second kind. Sturm-Lionville problems Orthogonality and Eigen function expansion.

UNIT -III: Lap lace Transforms: Liplike Transforms. Inverse Transform, Transform of derivatives and integrals, s-shifting, t-shifting, unit step function. Dirac's delta function, Differentiation and integration of Transforms. Convolution. Integral equation, partial fractions, Periodic & Applications.

UNIT -IV: Vector Differential Calculus: Vector and Scalar functions and fields. Derivatives, Curves. Tangents. Arc Length. Velocity. And acceleration, gradient of a scalar field Directional derivative, prevergence and curl of a vector field.

UNIT – V: Vector Integral Calculus: Line Integrals. Double integrals, Green's theorem in the plane, surfaces and surface integrals. Triple integrals. Divergence theorem of Gauses. Applications of divergence theorem and Stoke's theorem.

BOOKS RECOMONDED:

I. G. Das & S. Pattanayak - Fundamentats of Mathematics Analysis. Tata Mc.Graw Hill. Ch. 4 (excluding 4.5 and 4.15).

II E. Kreyszig - Advanced Engineering Mathematics -John Wiley & Sons, 7th Edition. Chapter 5,6,8 (excluding 8.1-8.3, 8.7, 8.12) and 9.

III J. Sinharoy & S. Padhy - A Course on Ordinary and Partial Differential Equations. Kalyani Publishers. Chapter 9. 10.

REFERENCE:

I. M.C. Potter & J.Goldberg: Mathematics Methods - Prentice Hall of India

PAPER – 2.2: COMPUTER ORGANISATION AND ARCHITECTURE

UNIT-I ADDRESSING METHODS AND MACHINE PROGRAM SEQUENCING:

Memory Locations, Addresses and Encoding of Information, Main Memory operations, Instructions and Instruction sequencing, Addressing Modes, Assembly Language, Basic Input Output Operations, Stacks and Queues, Subroutines.

UNIT-II: PROCESSING UNIT:

Fundamental concepts, Execution of a complete instruction, Hardwired Control, Performance Considerations, Micro programmed Control.

UNIT-III: INPUT - OUTPUT ORGANIZATION:

Accessing *VO* Devices, Interrupts, Direct Memory Access, I/O Hardware, Standard I/O Interfaces.

UNIT-IV: MEMORY:

Basic concepts, Semiconductor RAM memories, Read only Memories, Speed, Size and Cost, Cache Memories, Performance Considerations, Virtual Memories, Memory Management requirements.

UNIT-V: ARITHMETIC:

Number representations, Addition of Positive Numbers, Design of Fast Adders, Signed addition and subtraction, Arithmetic and Branching Conditions, Multiplication of Positive numbers, Signed-Operand Multiplication, Fast Multiplication, Integer Division, Floating-Point Numbers and Operations.

Text Book:

1. V.C Hamacher, Z.G. Vranesic, S G Zaky "Computer Organization", McGraw Hill International

Reference Book: M. Mano, "Computer System Architecture", PHI.J.P. Hayes, " Computer Architecture and Organization", McGraw Hill-International.

1. PAPER - 2.3 : DATA STRUCTURE USING C

UNIT – I. Data, Data types, Abstract data type, Data- Structure and its classification. Arrays, Stacks and Queues: Operations, Implementation and Applications.

UNIT - II : Dynamic Data Structure: Linked list, linked stacks and queues, Application to polynomial arithmetic,

UNIT - III: Graphs and trees: Classification & Representation, Binary tree traversal algorithms, Applications.

UNIT - IV: Search techniques, Search trees: BST. A VL tree, B-tree : Implementation and applications, hashing.

BOOK RECOMMENDED:

1. RL. Cruse, B.P. Leuog, C.L. Tondo : Data Structure and Program Design in C (PHI).
2. V.Langsam, M.J. Augestein, A.M. Tenenbaum : Data Structure using C & CH (PHI).

REFERENCE:

1. A.V. Aho, J.E.Hoperoll and J.D.Ullman: Data Structure & Alogorithms(A.W)
2. E.Horowitz and S.S.Shani: Data Structure in Pascal (Galgatia)
3. Trembly and S.Sorenson: Data Structure: Theory & Application (TMH)

4. **D.E.Knuth: Fundamentals of Algorithms(Narosa PH)P APER.-**

2.4 : DIGITAL ELECTRONICS

UNIT – I Circuit analysis design.

UNIT – II Data processing & arithmetic circuits

UNIT - III: Flip-flops registers and counter.

UNIT - IV: Switching Circuits, logic familiar semiconductor memory

UNIT – V: Clocks, timers D/A and A/D conversion.

BOOK RECOMMENDED:

1. D.P. Leach and A.P. Malvin6 : "Digital Principles & Applications", Mc.Graw-HiII International Editions.
2. R.E.Gawe, "Digital Electronics & Microcomputers", D.R. Publications

REFERENCE:

1. W.H. Gothman : "Digital Electronics, An Introduction to Theory &. Practice", PHI Ltd.. New Delhi
2. M.M. Mana, "Digital and Computer Design", Prentice Hall of India.

PAPER – 2.5 :INTRODUCTION TO DISCRETE MATHEMATICAL STRUCTURES

UNIT - I : Proof of an implementation of logic and methods of proof: Rules of were inference for quantified proposition. Mathematical induction.

UNIT - II : Sets* . Fuzzy sets, Relations and Functions, Fuzzy relations, Special properties of Binary Relations, equivalence relations, Ordering Relations, Operations on Relations.

UNIT - III: Generating Functions of Sequences, Recurrence relations. Solving recurrence relations substitution and generation functions, The method of characteristic roots, Solution of inhomogeneous recurrence relations.

UNIT - IV: Semigroups, Groups and Coding: Semi groups, Groups, Products and Quotients of Groups, Coding of Binary Information and Error Detection, Decoding and Error Correction.

UNIT - V: Latties, Boolean algebra's, atoms of a Boolean algebra, Finite Boolean algebra Boolean expressions, rings, fields, polynomial rings, field extension.

BOOK RECOMMENDED :

1. J.L.Mott, A.Kandel, T.P. Baker: Discrete Mathematics for Computer Scientist and Mathematicians - Prentice Hall of India, 2nd Edition, 1999. Chapters 1 3,4 (4.1-4.5)
2. B.Kolman, R.C.Busby, S.Ross : Discrete Mathematical Structures- Prentice Hall of India. Third Edition, 1999. Chapters: 5(5.1,5.2). 9 (excluding 9.3), 11.
3. Alan Doerr, K.Levasseur : Applied Structures for Computer Science, Galgotia \, Publications. 1995. Chapters 13(13.2-13.6), 16(16.1-16.4)

REFERENCE:

1. Trembly & Manohar : Discrete Mathematical Structures with Applications to Computer Sciences - Tata Mc. Graw-HilL 1997.
2. E.E. Rosen: Discrete Mathematics and its applications - Mc. Graw-Hill International.

PAPER - 2.6 : LABORATORY

C. PROGRAMMING: Laboratory work on Paper – 2.3

3rd SEMESTER (BCA)

PAPER – 3.1 OPERATING SYSTEM

BCA 3rd Semester

UNIT-I: What is an Operating System, Early Systems, Batch Systems, Time shared Systems, PC Systems, Parallel Systems, Distributed Systems, Real-time Systems, System structures, Computer System Operation, I/O Structure, Storage structure, Hardware protection, System Architecture, System Components, OS Services, System Calls, System Programs, System Structure, Virtual Machines, System Design and Implementation, System generation.

UNIT-II: Processes: Process concept, Process scheduling, Operation on processes, Cooperating processes, Threads and interprocess communication, CPU scheduling basic concepts, Scheduling criteria, Scheduling Algorithms, Multiple Processor scheduling, real-time scheduling.

UNIT-III: Process Synchronization: Back ground, Critical section problem, Synchronization hardware, semaphores, classical problems of synchronization, critical regions, Monitors, atomic transactions, Deadlocks: System model, deadlock characterization, methods for handling deadlocks, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock.

UNIT-IV: Memory management: Background, Logical vs. physical address space, scrapping, contiguous allocation, tagging, segmentation, segmentation with paging. Virtual Memory: Background, demand paging, page replacement with algorithms, allocation of frames, thrashing and demand segmentation.

UNIT-V: File System: File concepts, access methods, directory structure, protection, file system structure, allocation methods, free-space management, directory implementation and recovery, Secondary- Storage structure: Disk structure, disk scheduling, disk management scrap- space management, disk reliability and staple storage implementation.

References:

1. Operating systems concept by A Silberschalz and P.B.Galvin (Addison-Wesley).
2. Operating systems by William Stalling (PHI).
3. Operating systems by Milan Milenkovic (Mc-Grow Hill)

3:2 PROBABILITY AND STATISTICS

UNIT – 1: Statistics-Definition and use, Statistical data, Frequency distribution and its characteristics, Sample Space, events, and algebra of events, probability axioms, Additive and multiplicative laws of probability and applications. Conditional probability, Independence of events, Bays Rule.

UNIT- II: Random variables- Discrete and continuous, Discrete random variables: The probability mass function, special discrete distributions, Binomial and Poisson distributions, Discrete random vectors, Independent random variables, continuous random variables- probability density function and probability distribution function, uniform, Normal and exponential distributions, Functions of a random variable- Jointly distributed random variables, Distribution of sums. Function of Normal variables. The reliability, Failure density and Hazard function.

UNIT – III: Expectation of a random variable, Moments, Expectation of functions of more than one random variable. Moments of important distributions, conditional distribution and conditional expectation. Inequalities and Limit theorems: Markov inequality, Chebychev inequality, Weak law of large numbers, and central limit (without proof).

UNIT- IV: Population, sample, Random Sampling, Simple Random Sampling and Stratified sampling, Parameter, Statistic and its sampling distribution, Standard error Random sampling from a probability distribution, Sampling distribution of mean and variance in sampling from normal distribution, Statistical difference Parameter estimation and Hypothesis testing. Point estimation- Estimator, properties, Methods of Estimation- method of Moments, Method of maximum likelihood, Interval estimation- Confidence intervals, Testing of Hypothesis- Type I and Type II error, Power of test. Level of significance. Netman-Pearsan theory (concept only). Most powerful test. Tests of significance based on normal, t, F and Chi-square distributions.

UNIT- V: Correlation and Regression- Meaning and Concept, Linear Correlation-measurement, coefficient of correlation, Regression Lines-method of computation. Non-linear regression, Coefficient of determination, Test of regression relationship, Multiple correlation and regression- Computation and analysis. Analysis of variance.

Text Book:

1. Probability and Statistics with Reliability, Queuing and Computer Science Applications-Trivedi (PHI)
2. A first course with Statistics with Applications- A.K.P.C. Swain (Kalyani Publisher).
3. Fundamentals of Statistics (Vol-I) - Goon Gupta and Dasgupta (World Press).

3.3 DATA PROCESSING AND FILE STRUCTURE.

UNIT-I: DATA PROCESSING ACTIVITIES, AND FILE ORGANIZATION:

Data V s. information cost and value of infom1ation, data processing functions, data recording, I/O and storage devices. Files, file organization, file operations, performance considerations, File storage devices: characteristics of file storage devices, magnetic tape Vs. magnetic disk storage, other direct access storage devices.

UNIT- II SEQUENTIAL FILE ORGANIZATION AND FILE SORTING:

Sequentially organized files: creation, retrieval, update, and design of sequential files, Sorting and merging files: natural merge, balanced merge, and polyphone merge cascade merge, sort/merge performance.

UNIT-III RELATIVE FILE ORGANIZATION:

Relative files: direct mapping techniques, absolute Vs. relative addressing, directory look-up techniques, address calculating techniques, hashing techniques, Approaches to the problem of collisions-linear probing, double hashing, synonym chaining, bucket addressing.

UNIT-IV INDEXED - SEQUENTIAL FILE ORGANIZATION: Indexed-sequential file-dense Vs. non dense index, Primary Vs. Secondary index, multi level index, clustering index, structure of index sequential files-ISAM Vs. VSAM, implementation of indexing – binary search tree, m- way search tree, b- tree etc.

UNIT -: V MULTIKEY FILE ORGANIZATION AND INTRODUCTION TO DBMS: Multi key files: need for multiple access paths, inverted file Vs. multi list file organization, comparison and trade-off, file design summary. Introduction to DBMS: databases, database views, data base models-E-R model, relational model, data base implementation support, DBMS.

Text Book:

1. DATA MANAGEMENT AND FILE PROCESSING By Mary E.S. Loomis, PHI
2. INFORMATION SYSTEMS THROUGH COBOL By A.S. Philippakis and L.J. Kazmier, Mc Graw Hills.

3.4 NUMERICAL ANALYSIS & FORTRAN PROGRAMMING

UNIT – I Interpolation, Lagrange interpolating polynomial, error, interpolating polynomial using divided differences, forward and backward interpolating. Newton interpolating polynomials. Approximation of functions, least squares approximation.

UNIT- II Solution of non linear equations, bisection method, secant method, Newton's Rapson method, fixed point interaction method, Aitken's delta square process, Solution of linear system of equations: Gauss elimination method, matrix factorization method (Crout, Dolittle and Cholesky's method), Gauss Jacobi and Gauss Seidel method.

UNIT- III Numerical integration: Newton Cotes rules, compound quadrature method, Romberg integration, Gauss quadrature rules, Gauss Legendre rules. Numerical solutions of differential equations: Euler's method, Taylor's series method, and Runge – Kutta methods.

UNIT – IV Programming in FORTEN 90-i: Constants, variables, arthimetic expressions, input-output statements, conditional statements, loops, logical expressions, control structure, functions and subroutines, Array.

UNIT-V Format specifications, processing of strings and characters, procedures with array arguments, derived types, file processing, pointer data-type, use of modules.

Text Book:

1. A COURSE ON NUMERICAL ANALYSIS. By B.P. Acharya and R.N. Das (Kalyani pub.) Chapter 2 (2.1-2.4, 2.6-2.9), Chapter 3 (3.1-3.4, 3.6-3.10), Chapter 4 (4.3, 4.5), Chapter 6 (6.1-6.5,6.8,6.10,6.11), Chapter 7 (7.3, 7.4, 7.6, 7.7), Chapter 8 (8.1,8.2,8.4).
2. V.Rajaraman- Computer programming in Fortan 90 and 95: PHI,1997

References:

Numerical methods for mathematics, science and engineering,
John H. Mathews (PHI).

(3.5 COMPUTER GRAPHICS)

UNIT-I: Survey of computer graphics applications, overview of graphics system-video display devices, raster scan systems, graphics monitors and workstations, input devices, hard copy devices, graphics software, graphical user interface and interactive input methods- the user dialogue, input of graphical data, input function, interactive picture construction, virtual reality environment. Output primitives-line, circle and ellipse, generating algorithms, pixel addressing, filled area primitive, character generation.

UNIT-II: Attributes of output primitives-line and curve attributes, colour and gray scale levels, and area-fill attributers character attributer, bundled attribute, and anti-aliasing.

Two-dimensional geometric transformation-basic transformation- translation, rotation, scaling and matrix representation.

Composite transformation-translation, rotation, scaling, reflection, shear.

Transformation between coordinate system, offline transformation.

Two-dimensional viewing-viewing coordinates, point, line, polygon, curve and test clipping.

UNIT-III: Structure and hierarchical modeling, three dimensional display methods, three dimensional object representations-polygon surface, quadratic surface, straight line representation, Bezier curves and surfaces, b-straight line, curves and surfaces, displaying straight line curves, sweep representation, constructive solid geometry methods, BSP trees, fractal geometry method.

UNIT-IV: Three dimensional geometric and modeling transformation-translation, rotation, scaling, reflection, shears, coordinate transformation.

Three dimensional viewing-viewing coordinates, projection, projection transformation, and clipping.

UNIT-V: Visible surface detection methods-depth buffer, A-buffer, depth sorting, BSP tree method, Ray-Casting method, Illumination models, displaying light intensities method, Dithering, techniques, polygon-rendering methods-Guard shading, Phuong shading.

Computer Animation: Design of animation sequences, General Computer - Animation Functions, Raster Animations, Computer Animation Languages, Key-Frame Systems, Motion Specification.

Text Books:

1. D. Hearn & M.P. Baker- COMPUTER GRAPHICS (PHI).
2. R.S. Wright Junior, M. Sweet- OPEN GL SUPER BIBLE (TECHMEDIA).

Reference:

1. J.D. Foley, A. Vandal, Feinersteven, Hugh John- COMPUTER GRAPHICS: PRINCIPLES & PRACTICE (ADDISON WESLEY PUB. –1999)

BCA 4th Semester

PAPER 4.1 DATA COMMUNICATION AND COMPTUER NETWORK

UNIT-I: Introduction uses of computer network. Network hardware, Network software, Reterence model. Examples of networks. Transmission tern in Simplex, Half-duplex, Full duplex, frequency spectrum and bandwidth, Analog and digital data transmission. Transmission impairments, transmission media & its Characteristics.

UNIT-II: Data encoding and communication techniques, Modulation: AM, FM, PM, PCM, Asynchronous and synchronous transmission, Communication interfaces: Rs. 232C x 21. Multiplexing: FDM, TDM, Modems, multiplexing / concentrators, Front-end processors.

UNIT-III: Data link layer, Functionality, Framing Error detention and correction FEC, REC, CRC, Hamm in and other Codes, MAC Sub layer Advantage of multiple access sharing of channels, ALOHA, CSMA, ASMA/CD, Polling based MAC protocols: Token bus and Token ring.

UNIT-IV: Network Layer Layer functionality……..and connectionless service, routing – static & dynamic routing logarithms, IP – Protvcol, IP – routing. Congestion control, Transport Layer: TCP. Elements of transport protocols: Addressing, Establishing and releasing a connection, the Internet transport protocol IHP and UDP.

UNIT- V: Application layer: Network Security, SN, S.N, E- mail and Introduction to ATM.

Book Recommended:

1. Trannenbaum. A.S.” Computer Networks” PHI
2. Forouzan B.A Data communication and Networking” Tata Mc Graw Hill
3. Black , Computer Networks Protocols, Standards and Interfaces” PHI
4. Stallings W,”Computer Communication Networks” (4th edition) PHI).

PAPER 4.2 INTERNET TECHNOLOGIES AND APPLICATIONS

UNIT-I: Running a Java program, Data types. Vaiables, Operators. Control Statements, Arrays, Introduction to classes, Classes / Methods Constructors and Destructors, Garbage Collection, Overloading Methods. Passing objects as parameters, Inheritance, concept and use of super class, Multilevel Hierarchy, Method of overriding. Using abstract classes, Package Interfaces.

UNIT-II: Exception Handling Multithreading programming creating a Thread, Implementing the run able interface, Extending the thread class, Creating multiple threads, thread priorities, Synchronization of thread, Intertribal communication, stream classes, Character streams, Applet class, Event Handling AWT, Working with windows, Graphics and text.

UNIT-III: Common HTML commands using head, body, break, paragraph break, text styles, Different type of lists, Adding graphics to HTMI, documents and tables, using width, height, align, border, cell spacing, BG color, column span, row span attributes of a table, Linking documents and introduction to frames Link Images as hyperlinks, Frameset, frame, name, targeting named frames.

UNIT-IV: Building up java Syntax. Data types type casting, creating variables, Incorporating variables as a script, Java script array, Operators and expression, arithmetic operator, Comparison operator, string operators, conditional operator, ternary operator, special operators, Java script programming constructs, conditional checking, function and dialog boxes, Java script document object model, Java script assisted style sheets DOM (JSS DOS), browser, Handling events in java script. Dynamic HTML: Cascading style sheets: front colour and background text, border, margin, list attributes, Using span tag and <DIV> tag external style sheets.

UNIT-V: Clint-Server concept in Internet and communicating on the Internet. Internet Domains, Establishing connectivity on the Internet. URL, domain name registration, Introduction to WWW. Web Server and Browser, Introduction to CGI.

Books Recommended:

1. Programming with JAVA A primer E ……/ Tata Mc Grew Hills publishing Co-Ltd 2nd Edition.
2. Web enabled Commercial Application Development using HTML DHTM Jargon.

PAPER- 4.3 : OOP WITH C++

UNIT-I: C++ An Overview : Principles of objects oriented programming .C++ data types expressions, Operators, Statements.

UNIT-II: Procedure-based Programming: Function, Scope and life-time, Overloaded function, Function templates, Exception handling.

UNIT-III: Object-based programming: Class, Class initialization, constructor, destructor, Overloaded operators, Class Templates.

UNIT-IV: Object-Oriented programming & sub typing, Class inheritance & sub typing, virtual function.

UNIT-V: I/O & File handling Console I/O operating working with files.

4.3 BOOKS:

1. C++ primere by S.B. Lipman and J. Lajoie (AWL)
2. OOP with C++ by Dalagurusamy (TMH)
3. Prog. With C++ by Stroustrup (AWL)

PAPER - 4 : ACCOUNTING

UNIT-I: Accounting : The language of Business; Accounting as an Information System, Generally accepted Accounting Principles, Accounting Equations, Accounting Standards.

UNIT-II: Types of Accounts, Process of recording financial information, Journal & Ledger, Manual Accounting System and Computerized Accounting System.

UNIT-III: Sub-Division of journal, Cash Book, Bank Reconciliation Statement, Capital and Revenue Items, Trial Balance and Errors.

UNIT-IV: Preparation of Final Manufacturing Account, Trading Account, Profit & Loss Account and Balance Sheet , Adjustments in Final Account.

UNIT-V: Company Accounts, Share Capital and Loan Capital, Understanding Company Final Accounts, Annual Reports of the Company.

REFERENCES:

1. Meigs & Meigs: Accounting : The Basic for Business Decisions" (Mc Graw Hill)
2. Bhattacharya & Darden : "Accouting for Management : Text & Cases (Vani)
3. Juneau & Sarena ; Chawla "Accounting : Theory & Practice (Kalynni)
4. Growl, T.S: “Introduction to Accountancy (S. Chand)
5. Agawam, “Financial Accounting: Advanced” (Pitamber)
6. Rosanna Chandra: “Managers Guide to Finance & Accounting” (Tate Mc Grew Hill)
7. Maheswari: “Introduction to Accounting”.

PAPER 4.5 DATA BASE SYSTEMS

UNIT-I: Database system concepts and Architecture : Data Model, Schemas and instances ,DBMS Architecture and Data Independence, Database Language's and Interfaces, Database System Environment, Data 'Modeling using Entity Relationship Model: Entity types, Entity sets, Attributes and keys, Relationship types, rules, and structural constraints.

UNIT-II: Network Data Modeling concepts Constraints in the network model, network DDL and Network DML, Hierarchical Database structures, Integrity contaminants in hierarchical Model, Hierarchical DDL and I Hierarchical DML.

UNIT-III: : Relational Model concepts, Relational constraints and Relational Database Schemes, Update operations and constraints violations, Basic relational Algebraic operations.

UNIT-IV: Functional dependencies and Normalization for RDBMS: Design guidelines for relational schemes, Functional dependencies, Normal forms based on primary keys, second and third normal forms. Boyce-Code normal form, Algorithms for Relational Database scheme Design, Multilevel dependencies and fourth normal form, Join dependencies and fifth normal form.

UNIT-V: Transaction processing, Transaction and system concepts, Desirable

properties of transactions, schedules and recoverability, of schedules, locking techniques in Concurrency control, concurrency control based on time stamped ordering, Recovery Concepts.

TEXT BOOKS :
Elmasari R and Navathe, S.B : Fundamentals of Database System 3rd Edition.

REFERENCE:

1. Rama Krishna, R and Gehi- ke, J, Database Management Systems 2nd Edition.

PAPER – 4.6 : DBMS and Accounting.

PAPER – 4.7 : Programming in C++ and Graphics Programming.

5-1 Internet Technology & Applications – II

UNIT-I: TCP:IP (DNS, Email, FTP, TFTP, TELNET), Web Pages, Concept of' a tier, Static Web Pages, Plug-ins, Dynamic Web Pages &. Their technologies. Overview of Dynamic IITML. SGML, XML.
UNIT-II: Active Server Pages (ASP) (Basics or ASP technology, example, trends in(ASP), Java Virtual Machine, Java Served &. Java Server pages, Active Web pages (Java applets & life, cycle, Limitation of active web pages, Active X control Java Beans).
UNIT-III: Introduction to electronic commerce, User Sessions in E- commerce application, Technique for maintaining state information, P2P complexity, e-commerce transaction management (concepts, transaction processing monitors, object request brokers, Microsoft transaction & Queue server, enterprises java beans.)
Case safely: Online shopping with ASP

UNIT-IV: E-commerce security (Basic concepts, cry photography, Digital signature, Digital certification, practical issue Internet Clint side issues, organizational security and payment processing Mechanisms, Electronic Data Interchange.
UNIT-V: CORBA, Java Remote Method Invocation (RMI), Microsoft Distributed Component object Model (DCOM), Wireless Application protocol (WAP), Net and Web services.

BOOKS RECOMMENDED:

Text:
A.S.G. lobe & A. Karate – Web Technologies, Tata Mc Grew Hill.2003.
Chapters: 5 – 18, Appendix A & B.
Reference:

3. I. Bay Ross – Web Technology – BPB.
4. R. Kamala –Internet & Web Technologies- R. Kamala.

PAPER – 5.2 : COMBINATORICS AND GRAPH THEORY

UNIT-I: Basic counting principles, Permutations, Circular Permutations, Combinations, The Injection and Bisection Principles, Arrangements and Selections' with Repetitions, Arrangements with constrained repetitions.
UNIT-II: Binomial coefficients, Multinomial Theorem, Principles of Inclusion and Exclusion (application to integer solutions, sieve of Eratosthenes, Eulir – Op functions derangements), Generating Functions, The pigeonhole principle and Ramsey numbers.
UNIT-III: Basic concepts of graphs, Directed graphs, Paths and closures, Adjacency Mobiles, Isomorphism's and subgraphs, Multigraphs and Euler circuits, Hamiltonian Graphs.
UNIT-IV: Trees and their properties, spanning trees, Directed, Trees, Binary Trees, Planar graphs, Euler's formula.
UNIT-V: Chromatic numbers and Four colour problem, Network Flows & Graphs as Models of Flow of Commodities, Flows, Maximal Flows and Minimal cuts, The Max-Flow-Min Cut. Theorem, Matching and Hall's Marriagc theorem.

BOOK RECOMMENDED:

J:L. Mott, A. Kandel, T.P. Baker - Discrete mathematics for computer scientists and mathematicians, Prentice Hall of India, 2nd Edition, 1999.
Chapters: 2, 3 (3.1 and 3.2) 4 (4,6,4,7),5,7

REFERENCE:

1. V.K. Ramakrishna – Combinatory, Schism's outline series, Mc Graw Hill.
2. R.J. Wilson – Introduction to Graph Theory, Allison Wesley Lergram,
3. K.E. Rosen – Discrete Mathematics and Applications – Mc Grow Hill International – 4th Edition, 1999.

BCA – 5TH SEMESTER
5.3 BUSINESS PRACTICES

UNIT-I: Nature and purpose of business; Classification of business activities, Industry,
Commerce & Trade; Objectives of business
Forms of business organisation: Sole proprietorship, Partnership, Joint-stock companies, Co-operative societies (Meaning, Characteristics, Advantages, Disadvantages of each forms of organization).

UNIT-II: Joint stock companies: Types of companies; Registered companies, Statutory companies, Public company, Private company, Public enterprises. Shareholders' funds: Share capital, Types of shares,: Reserves; and. surplus, Loan Funds, Secured loans, Debentures, Public deposit.

UNIT-III: Trade: Home trade, foreign trade.
Channels of distribution: Wholesaler and retailer, Meaning & characteristics. Storage and Warehousing: Functions, Benefits and types.

UNIT-IV: Transport: Modes of transport, Land, Water and Air.
Insurance: Principles of insurance, Re-Insurance, Double insurance, Benefits of insurance.

UNIT-V: Financial institutions: Meanings & objectives.
Commercial banks: Objectives and functions.
Reserve Bank of India: Objectives and functions.

BOOKS RECOMMENDED:

1. Business Studies - Sharma & Gupta (Kalian)
2. Business Organisation - C.L.Chaturvedi and L.N.Agrawal (Sheer Mahavir Book Depot).
3. Principles of Business Organisation - S.P.Maheswari (Pitamber)

PAPER-5.4: TECHNICAL DOCUMANTATION, PRESENTATION AND COMMUNICATION SKILLS

UNIT-I: Nature and modes of communication, Speaking and writing, Audience, subject, time and place, purpose, Different ways of communication-narrative, description, exposition argument.

UNIT-II: Documentation References, note and bibliographic. Technical reports form and content, Paragraph writing.

UNIT-III: Business letters, fax and E-mail, Presentations.

UNIT-IV: Application for a job and constructing curriculum vitae, Facing the interview.

UNIT-V: Organization a meeting : The chair person's job, Preparing an agenda, Introducing a guest, Proposing a vote of thanks, Public speaking, writing the minutes, Interpersonal effectiveness, Useful expressions in everyday life situations introductions, greeting thanks, apologies, regret, saying goodbye, suggestions, invitations, good wishes, requests, asking permission, speaking on the telephone.

BOOKS RECOMMENDED:

1. Chand J.K. & Das B.C. A Millennium guide to writing and speaking English, Friend's Publishers, Cuttack.
2. Harris S. Human communication, BPB Publications.
3. Pradhan, Bhenda, Thakur, Business Communication, Himalayas Publishing

House.

4. Seely John: Oxford guide to writing and speaking, OUP.

REFERENCE:

1 The Chicago manual of style, 13th Edition, Prentice Hall of India.

PAPER 5.5 PRINCIPLES OF VISUAL AND WINDOWS PROGRAMMING

UNIT-I: Mastering the Integrated Development Environment (IDE) features Menu Bar, Tool Bar, Project Explorer, Properties window, From layout, window Toolbox, From Designer, Object Browse, Creation of Applet. Working with Forms: The border Title Bar, Caption, Control menu, Minimize Button, The Maximize / Restore Button, Working with form properties. (Back color Border style, caption, control box, fore color, height, icon, left, max button, mini button, name, window state). Form Events: The active event, Deactivate event. Load event Resize Event. Unload event. Working with Multiple Document Interface (MDI) forms: Creating MDI, Creating child form, Manipulation on MDI form, Control objects, command button, Test boxes, Labels, Option, Check Box.

UNIT-II: Events and Methods, Frame Control. List Boxes, Combo Boxes, Image Object. Picture Object Timer scroll Bar, Drive List, Directory List Boxes. File list box. Status bar, Manipulating Controls at run time, Early and late binding Variable.

UNIT-III: Active X Control, ADO (Active Data Object). A D O D B, Generating a windows GUL program (Creating and building the program the program classes and Files How the program works Implementing the view.)

UNIT-IV: Implementing the Document Storing the graphic data, Redraw the window Adding the Menu Command, Deleting the menu commands, Storing Documents in Disk Files, Scrolling and splitting views.

UNIT – V: Including Docking Toolbars and Status Bars, Creating Custom dialog boxes Writing dialog based Applications, Performing Character 1/0

BOOKS RECOMMENDED:

Visual Basic – 6 (complete reference) Denise Santoro, Gary Masters, BY B.P.B Publication.

Beginning Visual Basis 6 : By Peter Wright, SPD Pvt. Ltd.Wrox Press.

Mastering Visual C++ By: Michael J. Young. BPB Publication.