

SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL



Bachelor of Computer Application (BCA)

**Scheme & Syllabus
I, II, III Years**

Yearly Scheme

Bachelor of Computer Application (BCA)

First Year Scheme

Subject code	Subject Name	Internal Assessment		Theory		Practical	Grant Total
			Total		Total		
1BCA1	Foundation Course (Paper I)	10	20	25	80		100
1BCA2	Foundation Course (Paper II)	05		30			
1BCA3	Foundation Course (Paper III)	05		25			
1BCA4	Fundamental of Computer (Paper I)	10	15	40	85		100
1BCA5	Fundamental of Computer (Paper II)	10		40			
1BCA6	Programming in C (Paper I)	10	15	40	85	50	150
1BCA7	Programming in C (Paper II)	10		40			
1BCA8	Computer System Organization (Paper I)	10	15	40	85	50	150
1BCA9	Computer System Organization (Paper II)	10		40			
	Grant Total	65		335		100	500

Syllabus
BCA (Bachelor of Computer Application)
First Year
Paper I: Fundamental of Computers

UNIT – I

Brief history of development of computers, Computer system concepts, Computer system characteristics, Capabilities and limitations, Types of computers Generations of computers, Personal Computer (PCs) – evolution of PCs, configurations of PCs- Pentium and Newer, PCs specifications and main characteristics. Basic components of a computer system - Control unit, ALU, Input / Output functions and characteristics, memory - RAM, ROM, EPROM, PROM and other types of memory.

UNIT – II

Input / Output & Storage Units:-Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light pen, Touch Screen, Monitors - characteristics and types of monitor -Digital, Analog, Size, Resolution, Refresh Rate, Interlaced / Non Interlaced, Dot Pitch, Video Standard - VGA, SVGA, XGA etc, Printers& types - Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter, Sound Card and Speakers, Storage fundamentals - Primary Vs Secondary Data Storage and Retrieval methods - Sequential, Direct and Index Sequential, SIMM, Various Storage Devices - Magnetic Tape, Magnetic Disks, Hard Disk Drives, Floppy Disks, Optical Disks, CD, Blue Ray Disc

UNIT – III

Software and its Need, Types of Software - System software, Application software, System Software - Operating System, Utility Program, Programming languages, Assemblers, Compilers and Interpreter, Introduction to operating system for PCs-DOS Windows, Linux, File Allocation Table (FAT & FAT 32), files & directory structure and its naming rules, booting process details of DOS and Windows, DOS system files Programming languages- Machine, Assembly, High Level, 4GL, their merits and demerits, Application Software and its types - Word-processing, Spreadsheet, Presentation Graphics, Data Base Management Software, characteristics, Uses and examples and area of applications of each of them, Virus working principles, Types of viruses, virus detection and prevention, viruses on network.

UNIT – IV

Use of communication and IT , Communication Process, Communication types- Simplex, Half Duplex, Full Duplex, Communication Protocols, Communication Channels - Twisted, Coaxial, Fiber Optic, Serial and Parallel Communication, Modem - Working and characteristics, Types of network Connections - Dialup, Leased Lines, ISDN, DSL, RF, Broad band ,Types of Network - LAN, WAN, MAN ,Internet, VPN etc., Topologies of LAN - Ring, Bus, Star, Mesh and Tree topologies, Components of LAN -Media, NIC, NOS, Bridges, HUB, Routers, Repeater and Gateways. Internet-Evolution, World Wide Web Internet Services, Convergence of technologies.

UNIT-V

Management information system - Introduction, Characteristics, Needs, Different views of MIS, Designing, Placement of MIS, Pitfalls in Designing an MIS, Computer based MIS – Advantages & Disadvantages. Computer Applications in Business-Need and Scope, Computer Applications in Project Management, Computer in Personnel Administration, Information System for Accounting-Cost and Budgetary Control, Marketing and Manufacturing, Computer Applications in Materials Management, Insurance and Stock-broking, Production planning and Control, Purchasing, Banking, Credit and Collection, Warehousing. Use of computers in common public services and e-governance.

TEXT & REFERENCE BOOKS:

- Anurag Seetha, “Introduction to Computers and Information Technology”, Ram Prasad & Sons, Bhopal.
- S.K. Basandra, “Computers Today “, Galgotia Publications.
- Alexis Leon & Mathews Leon, “Fundamentals of Information technology “, Vikas Publishing House, New Delhi.
- Rajeev Mathur, “ DOS Quick reference “, Galgotia Publication

First Year
Paper II: Fundamental of Computers

UNIT – I

MS Windows: Introduction to M.S. Windows; Features of Windows; Various versions of Windows & its use; Working with Windows; My Computer & Recycle bin ; Desktop, Icons and Windows Explorer; Screen description & working styles of Windows; Dialog Boxes & Toolbars; Working with Files & Folders; simple operations like copy, delete moving of files and folders from one drive to another, Shortcuts & Autostarts; Accessories and Windows Settings using Control Panel- setting common devices using control panel, modem, printers, audio, network, fonts, creating users, internet settings, Start button & Program lists; Installing and Uninstalling new Hardware & Software program on your computer.

UNIT – II

MS Word Basics: Introduction to MS Office; Introduction to MSWord; Features & area of use. Working with MS Word.; Menus & Commands; Toolbars & Buttons; Shortcut Menus, Wizards & Templates; Creating a New Document; Different Page Views and layouts; Applying various Text Enhancements; Working with – Styles, Text Attributes; Paragraph and Page Formatting; Text Editing using various features ; Bullets, Numbering, Auto formatting, Printing & various print options

UNIT-III

Advanced Features of MS-Word: Spell Check, Thesaurus, Find & Replace; Headers & Footers ; Inserting – Page Numbers, Pictures, Files, Auto texts, Symbols etc.; Working with Columns, Tabs & Indents; Creation & Working with Tables including conversion to and from text; Margins & Space management in Document; Adding References and Graphics; Mail Merge, Envelops & Mailing Labels. Importing and exporting to and from various formats.

UNIT – IV

MS Excel: Introduction and area of use; Working with MS Excel.; concepts of Workbook & Worksheets; Using Wizards; Various Data Types; Using different features with Data, Cell and Texts; Inserting, Removing & Resizing of Columns & Rows; Working with Data & Ranges; Different Views of Worksheets; Column Freezing, Labels, Hiding, Splitting etc.; Using different features with Data and Text; Use of Formulas, Calculations & Functions; Cell Formatting including Borders & Shading; Working with Different Chart Types; Printing of Workbook & Worksheets with various options.

UNIT – V

MS PowerPoint: Introduction & area of use; Working with MS PowerPoint; Creating a New Presentation; Working with Presentation; Using Wizards; Slides & its different views; Inserting, Deleting and Copying of Slides; Working with Notes, Handouts, Columns & Lists; Adding Graphics, Sounds and Movies to a Slide; Working with PowerPoint Objects; Designing & Presentation of a Slide Show; Printing Presentations, Notes, Handouts with print options. Outlook Express: Features and uses, Configuring and using Outlook Express for accessing e-mails in office.

Text & Reference Books:

- Windows XP Complete Reference. BPB Publications
- MS Office XP complete BPB publication
- MS Windows XP Home edition complete, BPB Publications

First Year
Paper I: Programming in C

UNIT – I

Program Concept, Characteristics of Programming, Various stages in Program Development Programming aids Algorithms, Flow Charts - Symbols, Rules for making Flow chart, Programming Techniques – Top down, Bottom up, Modular, Structured - Features, Merits, Demerits, and their Comparative study. Programming Logic- Simple, Branching, Looping, Recursion, Cohesion & Coupling, Programming Testing & Debugging & their Tools.

UNIT – II

Introduction to C language, C language standards features of C, Structure of C program. Introduction to C compilers, Creating and compiling C Programs, IDE features of Turbo C compiler, Command line options to compile C program in TC.

UNIT – III

Keywords, Identifiers, Variables, constants, Scope and life of variables - local and global variable. Data types, Expressions, Operators: Arithmetic, Logical, Relational, Conditional and Bit wise Operators. Precedence and Associativity of Operators, Type conversion. Basic input/output library functions: Single character input/output i.e. getch(), getchar(). getche(), putchar(). Formatted input/output i.e. printf() and scanf(). Library functions: Mathematical & Character functions.

UNIT – IV

Declaration statement, conditional statement: If statement, If.....Else statement, Nesting of If Else Statement, else if ladder, The?: operator, Switch statement. Iteration statements: for loop, while loop, do-while loop. Jump statements: break, continue, goto exit ().

UNIT – V

ARRAYS: concept of Single and Multi Dimensional arrays, Array declaration and initialization of arrays Strings: declaration, initialization.

TEXTS & REFERENCE BOOKS:

- E. Balaguruswamy, “Programming In C ”, TMH Publications
- Gottfried, Schaums Outline Series, “ Programming With C ”, TMH Publications
- Mahapatra, “ Thinking In C ”, PHI Publications
- Anurag Seetha, “Introduction To Computers And Information Technology”, Ram Prasad & Sons, Bhopal.
- S.K.Basandra, “Computers Today ” Galgotia Publications.
- Peter Juliff, “ program design ”, PHI Publications

First Year
Paper II: Programming in C

Unit I

Introduction to Computer Based Problem Solving: Problem Definition, Problem Solving, Goals and Objectives, Problem Identification and Definition, program Design and Implementation Issues: Programming, Algorithm, System Design Techniques, Programming Techniques, Basic Constructs of Structured Programming, Modular Design of Programs, Communication between Modules. Module Design Requirements.

Unit II

The need of C functions, User defined and library function, prototype of functions, prototype of main() function, Calling of functions, Function arguments, argument passing: call by value and call by reference, Return values. Nesting of function, Recursion, Array as function argument, Command line arguments. Storage class specifier - auto, extern, static, register.

Unit-III

Defining structure, Declaration of structure variable, typedef, Accessing structure members, Nested structures, Array of structure, Structure assignment, Structure as function argument, Function that return structure, Union. Concept of debugging. Finding Errors in the programs, error codes and their meanings, Various debugging options in Turbo C compiler. (Debug and Options Menu of the TCC IDE)

Unit -IV

Pointers: Introduction to Pointers, Pointers Notation, Pointer Notation and declaration and Initialization, Accessing Variable through Pointer, Pointer Expressions, Pointers and One Dimensional Arrays

Unit-V

File Handling In C: what is a File? , Defining and Opening a File, Closing a File, Input/Output Operations on Files, Functions for Random Access to Files, Example Programs.

C Preprocessor: Introduction to Preprocessor, Macro Substitution (#define), Undefined a Macro (#undef), File Inclusion, Conditional Compilation Directives (#if, #else, #elif, #endif, #ifdef, #ifndef).

TEXTS & REFERENCE BOOKS:

- > E. Balaguruswamy, "Programming In C ", TMH Publications
- > Gottfried, Schaums Outline Series, " Programming With C ", TMH Publications
- > Mahapatra, " Thinking In C ", PHI Publications
- > Anurag Seetha, "Introduction To Computers And Information Technology", Ram Prasad & Sons, Bhopal.
- > S.K.Basandra, "Computers Today " Galgotia Publications.
- > Peter Juliff, " program design ", PHI Publications

First Year

Paper I: Computer System Organization

Unit – I

Data Representation, Data Types, Number Systems, Octal and Hexadecimal, Numbers, Decimal Representation, Alphanumeric Representation, Complements, (r-1)'s Complement, (r's) Complement, Subtraction of Unsigned Numbers, Fixed-Point Representation, Integer Representation, Arithmetic-Addition, Arithmetic Subtraction, Overflow, Decimal Fixed-Point Representation, Floating- Point Representation.

Unit – II

Digital Component, Integrated Circuits, Decoders, NAND Gate Decoder, Decoder, Expansion, Encoders, Multiplexers, Registers, Register with Parallel Load, Shift Registers, Bidirectional Shift Register with Parallel Load, Binary Counters, Binary Counter with Parallel Load, Memory Unit, Random-Access Memory, Read-Only Memory, Types of ROMs.

Unit – III

Combinational Circuits, Half-Adder, Full-Adder, Flip-Flops, SR Flip-Flop, D Flip-Flop, JK Flip-Flop, T Flip-Flop, Edge-Triggered Flip-Flops, Excitation Tables, Sequential Circuits, Flip-Flop Input Equations, State Table, State Diagram

Unit – IV

Basic Computer Organization and Design, Instruction Codes, Stored Program, Organization, Indirect Address, Computer Registers, Common Bus System, Computer Instructions, Instruction Set Completeness, Timing and Control, Instruction Cycle.

Input-Output and Interrupt, Input-Output Configuration, Input-Output Instructions

Unit – V

Interrupt, Interrupt Cycle, Complete Computer Description, Design of Basic Computer, Control Logic Gates, Control of Registers and Memory, Control of Single Flip-Flops, Control of Common Bus, Design of Accumulator Logic, Control of AC Register, Adder and Logic Circuit, **Programming the Basic Computer**, Introduction, Machine Language, Assembly Language, Rules of the Language, An Example, Translation to Binary, The Assembler, Representation of Symbolic Program in Memory, First Pass, Second Pass.

REFERENCE BOOKS:

- BARTEE, "Digital Computer Fundamentals" TMH Publication ISBN 0-07-003899-6
- MALVINO, "Digital Computer Electronics" TMH Publication ISBN 0-07-462235-8
- MORRIS MANO, "Computer System Architecture" PHI Publication ISBN 81-203-0417-9

First Year
Paper II: Computer System Organization

UNIT – I

Binary, ASCII, EBCDIC Codes, Gray Code, Other Decimal Codes, Other Alphanumeric Codes, Error Detection Codes

UNIT – II

Boolean Algebra, Basic Boolean Law's, Demorgan's theorem, MAP Simplification, Minimization techniques, K -Map, Sum of Product & Product of Sum

UNIT – III

Combinational & Sequential circuits, Half Adder & Full Adder, Full subtractor, Flip-flops - RS, D, JK & T Flip-flops, Shift Registers, RAM and ROM, Multiplexer, Demultiplexer, Encoder, Decoder

UNIT – IV

I/O Interface, Properties of simple I/O devices and their controller, Isolated versus memory-mapped I/O, Modes of Data transfer, Synchronous & 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 table, Page Replacement, Cache Memory, Hit Ratio, Mapping Techniques, Writing into Cache TEXT

REFERENCE BOOKS:

- BARTEE, “Digital Computer Fundamentals” TMH Publication ISBN 0-07-003899-6
- MALVINO, “Digital Computer Electronics” TMH Publication ISBN 0-07-462235-8
- MORRIS MANO, “Computer System Architecture” PHI Publication ISBN 81-203-0417-9

Yearly Scheme for BCA

(Bachelor of Computer Application)

Second Year Scheme

Subject code	Subject Name	Internal Assessment		Theory		Practical	Grant Total
			Total		Total		
2BCA1	Foundation Course (Paper I)	10	20	30	80		100
2BCA2	Foundation Course (Paper II)	05		30			
2BCA3	Foundation Course (Paper III)	05		25			
2BCA4	System Analysis and Design	10	15	40	85		100
2BCA5	Operating System	10		40			
2BCA6	Programming in C ++	10	15	40	85	50	150
2BCA7	Data Base Management System	10		40			
2BCA8	Mathematics 1	10	15	40	85		100
2BCA9	Mathematics 2	10		40			
2BCA10	ASP.Net & C#					50	50
Grant Total			65		335	100	500

Practical Group		
2BCA6	Programming in C ++	50
2BCA7	Data Base Management System	
2BCA10	ASP.Net & C#	50
Total		100

BCA

Second Year Syllabus

Paper I: 2BCA4-SYSTEM ANALYSIS AND DESIGN

UNIT-I

System Concept: Definition, Characteristics, Elements of system, Physical and abstract system, open and closed system, man-made information systems. System Development Life Cycle: Various phases of system development, Considerations for system planning and control for system success. System Planning: Base for planning a system, Dimensions of Planning.

UNIT-II

Initial Investigation: Determining users requirements and analysis, fact finding process and techniques. Feasibility study: Determination of feasibility study, Technical, Operational & Economic Feasibilities, System performance constraints, and identification of system objectives, feasibility report. Cost/Benefit Analysis: Data analysis, cost and benefit analysis of a new system. Categories determination and system proposal.

UNIT-III

Tools of structured Analysis: Logical and Physical models, context, diagram, data dictionary, data diagram, form driven methodology, IPO and HIPO charts, Gantt charts, system model, pseudo codes, Flow charts- system flow chart, run flow charts etc., decision tree, decision tables, data validation, Input/ Output and Form Design: Input and output form design methodologies, menu, screen design, layout consideration.

UNIT-IV

Management standards – Systems analysis standards, Programming standards, Operating standards. Documentation standards – User Manual, system development manual, programming manual, programming specifications, operator manual. System testing & quality: System testing and quality assurance, steps in system implementation and software maintenance. System security: Data Security, Disaster/ recovery and ethics in system development, threat and risk analysis. System audit.

UNIT-V

Organisation of EDP: Introduction. Job Responsibilities & duties of EDP Personnels- EDP manager, System Analyst, Programmers, Operators etc. Essential features in EDP Organization. Selection of Data Processing Resources: purchase, lease, rent-advantages and disadvantages. Hardware and software procurement – In-house purchase v/s hiring and lease.

Text & Reference Books:

System Analysis & Design by V K Jain, Dreamtech Press

Modern System Analysis & Design by A Hoffer, F George, S Valaciah Low Priced Edn. Pearson Education.

Information Technology & Computer Applications, by V.K.Kapoor, Sultan Chand & Sons, New Delhi.

Second Year
Paper: 2BCA5 OPERATING SYSTEM

UNIT-I

Definitions, functions and types of operating system, System components, Operating system Services, System Calls, System programs, System structure.

UNIT-II

Process Concepts, process state & process control block, Process Scheduling, Scheduling Criteria, Scheduling Algorithms, MultipleProcessor Scheduling Real-Time Scheduling, Threads, Threads in Linux.

UNIT-III

Critical Section Problem , Semaphores, Classical Problem Of Synchronization, , Deadlock Characterizations, Method for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock, Process Scheduling in Linux.

UNIT-IV

Logical versus physical address space, Swapping, Contiguous Allocating, Paging, Segmentation, Virtual Memory, Demand Paging, Performance of Demand Paging, Page Replacement, Page Replacement Algorithms, Memory Management in Linux

UNIT-V

Disk Scheduling, Disk Management, Swap Space Management, Disk reliability, Stable Storage Implementation. File Concepts Directory structure, Protection, File system in Linux. TEXT &

REFERENCE BOOKS:-

Operating System Concepts by Silberschatz & Galvin, Addison Wesley Publication 6th Edition.
Operating System Concepts & Design by Milan Milen Kovic, TMH Publication

Second Year

Paper: 2BCA6 Programming in C ++

UNIT-I

Overview of C++: Object oriented programming, Concepts, Advantages, Usage. C++ Environment: Program development environment, the language and the C++ language standards. Introduction to various C++ compilers, C++ standard libraries, Prototype of main() function, Data types. Creating and compiling C++ Programs using IDE and through command line, IDE features for compiling, debugging, tracing and testing the C++ program in Turbo C++/Borland C++ /Micro Soft VC++ / GNU C++ compiler. Classes & Objects : Classes, Structure & classes, Union & Classes, Friend function, Friend classes, Inline function, Scope resolution operator, Static class members, Static data member, Static member function, Passing objects to function, Returning objects, Object assignment.

UNIT-II

Array, Pointers References & The Dynamic Allocation operators : Array of objects, Pointers to object, Type checking C++ pointers, The This pointer, Pointer to derived types, Pointer to class members, References: Reference parameter, Passing references to objects, Returning reference, Independent reference, C++ 's dynamic allocation operators, Initializing allocated memory, Allocating Array, Allocating objects. Constructor & Destructor: Introduction, Constructor, Parameterized constructor, Multiple constructor in a class, Constructor with default argument, Copy constructor, Default Argument, Destructor.

UNIT-III

Function & operator overloading : Function overloading, Overloading constructor function finding the address of an overloaded function, Operator Overloading: Creating a member operator function, Creating Prefix & Postfix forms of the increment & decrement operation, Overloading the shorthand operation (i.e. +=,-= etc), Operator overloading restrictions, Operator overloading using friend function, Overloading New & Delete, Overloading some special operators, Overloading [], (), -, comma operator, Overloading << .

UNIT-IV

Inheritance : Base class Access control, Protected members, Protected base class inheritance, Inheriting multiple base classes, Constructors, destructors & Inheritance, When constructor & destructor function are executed, Passing parameters to base class constructors, Granting access, Virtual base classes . Virtual functions & Polymorphism: Virtual function, Pure Virtual functions, Early Vs. late binding

UNIT-V

The C++ I/O system basics : C++ streams, The basic stream classes: C++ predefined streams, Formatted I/O: Formatting using the ios members, Setting the format flags, Clearing format flags, An overloaded form of setf (), Examining the formatted flags, Setting all flags, Using width() precision() and fill(), Using manipulators to format I/O, Creating your own manipulators.

TEXT & REFERENCE BOOKS :

- Herbert Schildt, "C++ The Complete Reference " - TMH Publication
- R. Subburaj, "Object Oriented Programming With C++ ", Vikas Publishing House, New Delhi
- E. Balguruswamy, "C++ ", TMH Publication
- M Kumar "Programming In C++", TMH Publications
- R. Lafore, "Object Oriented Programming C++ "
- Ashok . N. Kamthane, "Object Oriented Programming with ANSI & Turbo C++", Pearson Education Publication

Second Year

Paper: 2BCA7 Data Base Management System

UNIT-I

Operational data, Purpose of database system, Views of data, Data models: Relational, Network, Hierarchical, Instances & Schemes, Data Dictionary, Types of Database languages : DDL, DML, Structures of a DBMS, Advantages & Disadvantages of a DBMS, 3-level Architecture Proposal : External, Conceptual & Internal Levels, Entity Relationship Model as a tool of conceptual design : Entities & Entity set, Relationship & Relationship set, Attributes, Mapping Constraints, Keys, Entity-Relationship diagram (E-R diagram) : Strong & weak entities, Generalization, Specialization, Aggregation, Reducing ER diagram to tables

UNIT-II

Set theory concepts and fundamentals: Relations, Domains, Attributes, Tuple, Concepts of Keys: Candidate key, Primary Key, Alternate Key, Super Key, Foreign Key, Fundamental integrity rules: Entity integrity, Referential integrity, Extension & Intention Functional Dependencies, Good & Bad Decomposition, Anomalies as a database: A consequences of bad design, Universal Relation, Normalization: 1NF, 2NF, 3NF, BCNF, 4NF 5NF.

UNIT-III

Relational Algebra: Select, Project, Cross product, Different types of joins i.e. theta join, equi-join, natural join, outer join, set operations . Structured query language(SQL), Using MS Access, Implementing SQL Functions, Integrity, Indexing, View Using MS Access. DBA – Role, Functionality and Importance.

UNIT-IV

Failure Classification, The Storage Hierarchy, Transaction Model, Storage and File Structure, RAID, Storage Access, File Organization, Organization of Records in File, Data Dictionary storage.

UNIT-V

Database functionality and Importance. Database system architectures-centralized system, client server system, parallel system, distributed system. Overview Database on Web-concepts of ODBC, DSN.

TEXT & REFERENCE BOOKS:

- “Database Management System” by Leon & Leon, Vikas Publications
- “Database System Concepts” by Henry F.Korth & Abraham Silberschatz .
- “An introduction to database system” by Bipin C.Desai
- “An Introduction To Database System” by C.J.Date

Second Year
Paper: 2BCA8 Mathematics

UNIT-I

Statements, logical connectives, truth tables. tautologies, contradictions, logical equivalence. Applications to everyday reasoning.

UNIT-II

An axiom system for the sentence calculus. Truth tables as an effective procedure for deciding logical validity. Relation of sentence calculus to Boolean algebra.

UNIT-III

Quantifiers: Universal and existential quantifier. Predicate calculus. Axiom system for predicate calculus. Application to everyday reasoning.

UNIT-IV

Sets and classes. Relations. Equivalence relation and equivalence classes. Partial order relation, lub and glb. Trees and lattices. Mappings: injective, surjective and bijective mappings. Cardinality. Finite and infinite sets.

UNIT-V

Definition and basic properties of: semigroups and groups, rings, integral domains, and fields.

TEXTS AND REFERENCE BOOKS:-

ASTRY, "Engineering Mathematics", Prentice Hall of India

Bernard Kolman, Robert C. Busby, Sharon Ross, "Discrete Mathematical Structures Engineering Mathematics "

Second Year
Paper: 2BCA9 Numerical Methods

UNIT –1

Representation of a computer on a computer, difference between floating point and real arithmetics, different types of errors, Error in the approximation of a function, Error in series approximation.

UNIT-2

Solution of algebraic and transcendental equation using bisection method, regularfalse method, newtonraphson method. Solution of simultaneous linear equations using gaussblimination method, jacobi' siterative method,gaussseidel iterative method.

UNIT-3

Interpoiation: finite difference and operators,newton forward,newton backward, games forward,games backward,stirling' sinterpolation divided difference formula

UNIT-4

Numerical differenciation , formula for derivatives maxima and minima of a tabulated
Numerical integration: newton-cotes formula, tapezoidal rule, simpson's rule, weddle's rule.

UNIT-5

Solution of ordinary differential equation using picard's method,taylor's series method, euler,s method, modified euler's method, runge_knutta method, predictor-corrector method.

TEXT & REFF. BOOKS

- Numerical methods in engg & science b.s.grawal
- Numerical method –s.s sastry

Second Year
Paper: 2BCA10 ASP.NET & C#

UNIT – I

Overview of ASP.NET framework, Understanding ASP.NET Controls, Applications Web servers, installation of IIS. Web forms, web form controls -server controls, client controls, web forms & HTML, Adding controls to a web form ,Buttons, Text Box , Labels, Checkbox, Radio Buttons, List Box, etc. Running a web Application, creating a multiform web project.

UNIT-II

Form Validation: Client side validation, server Side validation, Validation Controls : Required Field Comparison Range. Calendar control, Ad rotator Control, Internet Explorer Control. State management- View state, Session state, Application state,

UNIT-III

Architecture of ADO.NET, Connected and Disconnected Database, Create Connection using ADO.NET Object Model, Connection Class, Command Class, DataAdapter Class, Dataset Class. Display data on data bound Controls and Data Grid. Database Accessing on web applications: Data Binding concept with web, creating data grid, Binding standard web server controls. Display data on web form using Data bound controls.

UNIT-IV

Writing datasets to XML, Reading datasets with XML. Web services: Introduction, Remote method call using XML, SOAP, web service description language, building & consuming a web service, Web Application deployment.

UNIT-V

Overview of C#, C# and .NET, similarities & differences from JAVA, Structure of C# program. Language features: Type system, boxing and unboxing, flow controls, classes, interfaces, Serialization, Delegates, and Reflection.

TEXT BOOKS & REFERENCE BOOKS

- > VB.NET Black Book by steven holzner–dreamtech
- > ASP.NET Unleashed C# programming –wrox publication
- > C# programming Black Book by Matt telles

Yearly Scheme & Syllabus
Bachelor of Computer Application (BCA)
3rd Year Scheme

Subject code	Subject Name	Internal Assessment		Theory		Practical	Grant Total
			Total		Total		
3BCA1	Foundation Course (Paper I)	10	20	25	80		100
3BCA2	Foundation Course (Paper II)	05		30			
3BCA3	Foundation Course (Paper III)	05		25			
3BCA4	Data Structures	10	20	40	80	50	150
3BCA5	ASP.Net with C#	10		40			
3BCA6	Programming With JAVA	10	20	40	80	50	150
3BCA7	Web Designing & Web Technology	10		40			
3BCA8	Data Communication	10	20	40	80		100
3BCA9	Computer Networks	10		40			
3BCA10	Major Project					50	50
Grant Total		80		320		150	550
Practical Group							
3BCA11	Data Structures & ASP.Net with C#					50	
3BCA12	Programming With JAVA & Web Designing & Web Technology					50	
3BCA10	Major project					50	
Total						150	

Syllabus BCA
Third Year
Paper: **3BCA4 Data Structures**

Unit 1: File Structures Terminology, File Organisation, Sequential Files, Structure, Operations, Disadvantages, Areas of use, Direct File Organisation, Indexed Sequential File Organisation.

UNIT-2: Stack and Queue: contiguous implementations of stack, various operations on stack, various polish notations-infix, prefix, postfix, conversion from one to another-using stack; evaluation of post and prefix expressions. Contiguous implementation of queue: Linear queue, its drawback; circular queue; various operations on queue; linked implementation of stack and queue- operations

Unit 3: Arrays Array's and Pointers, Representation of Arrays, Row Major Representation, Column Major Representation, Array's Applications

General List: list and it's contiguous implementation, it's drawback; singly linked list- operations on it; doubly linked list-operations on it; circular linked list; linked list using arrays.

UNIT-4: Searching, Hashing and Sorting: requirements of a search algorithm; sequential search, binary search, indexed sequential search, interpolation search; hashing-basics, methods, collision, resolution of collision, chaining; Internal sorting- Bubble sort, selection sort, insertion sort, quick sort, merge sort on linked and contiguous list, shell sort, heap sort, tree sort.

UNIT-5: Graphs: related definitions: graph representations- adjacency matrix, adjacency lists, adjacency multilist traversal schemes- depth first search, breadth first search; Minimum spanning tree; shortest path algorithm; kruskals & dijkstras algorithm.

Third Year

Paper: 3BCA5 ASP.NET with C#

UNIT-I: Introduction to .NET Framework: .NET framework, MSIL, CLR, CLS, CTS, Namespaces and Assemblies Garbage Collection

Unit- 2: C# -The Basics and Console Applications in C#: Name Spaces -Constructor and Destructors, Function Overloading & Inheritance, Operator Overloading, Modifiers -Property and Indexers , Attributes & Reflection API, When to use Console Applications -Generating Console Output, Processing Console Input

Unit-3: ASP.NET: Introduction to ASP.NET, Working with Web and HTML Controls, Using Rich Server Controls, Login controls, Overview of ASP .NET Validation Controls, Using the Simple Validations, Using the Complex Validators Accessing Data using ADO.NET, Accessing Data using ADO.NET, Configuration Overview

Unit-4: Managing State: Preserving State in Web Applications and Page-Level State, Using Cookies to Preserve State, ASP.NET Session State, Storing Objects in Session State, Configuring Session State, Setting Up an Out-of-Process State Server, Storing Session State in SQL Server, Using Cookieless Session IDs, Application State Using the DataList and Repeater Controls, Overview of List-Bound Controls, Creating a Repeater Control and DataList Control

Unit-5: Themes and Master Pages: Creating a Consistent Web Site, ASP.NET 2.0 Themes - Master Pages, Displaying Data with the GridView Control Introducing the GridView Control, Filter Data in the GridView Control, Allow Users to Select from a DropDownList in the Grid, Add a Hyperlink to the Grid, Deleting a Row and Handling Errors

Third Year

Paper: 3BCA6 Programming with JAVA

UNIT- I: C++ Vs JAVA, JAVA and Internet and WWW, JAVA support systems, JAVA environment, JAVA program structure, Tokens, Statements, JAVA virtual machine, Constants & Variables, Data Types, Type Casting, Operators , Expressions & its Evaluation, Decision making and branching, Loops, Jumps in Loops, Labeled Loops

UNIT- II: Defining a class, Adding variables and methods, Creating objects, Accessing class members, Constructors, Method overloading , Static members, Nesting of methods,

UNIT – III: Inheritance: Extending a class, Overriding methods, Final variables and method~, Final classes, Finalizes methods, Abstract methods and classes, Visibility control

UNIT- IV: Arrays, One dimensional & two dimensional, Strings, Vectors, Wrapper classes, Defining interfaces, Extending interfaces, Implementing interfaces, Accessing interface Variables, System packages, Using system packages, Naming conventions, Creating packages, Accessing a package, Using package, Adding a class to a package, Hiding classes.

UNIT – V: Threads, Creating threads, Extending the threads class, Stopping and blocking a thread, Life cycle of a thread, Using thread methods, Thread exceptions, Thread priority, Synchronization, Implementing the runnable Interface.

Third Year

Paper: 3BCA7 Web Designing & Web Technology

UNIT – I: Client server Computing Concepts, Distributed computing on the Internet, Introduction to Web Pages, HTML, HTML Elements and pages, Formatting text & pages, including picture in a page, creating tables and lists, splitting pages into frames. HTML 5

UNIT – II: Site Design and Navigation: The home page Navigational tools. Formatting the body section using block level, using text level.

Using font style, using phrase elements **UNIT – III:** Java Script and Browser, Java Script and sever, Embedding Java Script & HTML, Java Script fundamentals Variables, Value Store house, statements, loops, condition and functions, objects properties and methods. Event handlers and non script tag.

UNIT – IV: Comparison of HTML, DHTML and XML web casting, Domain name selection , web server selection, Web hosting, uploading and downloading of web, incremental uploading of data, introduction to SQL Server, Introduction to user management in SQL – Server.

UNIT – V: Introduction to ASP, database handling with ASP, Connection object, record set object, request object, response object, cookies, creating tables and insert query through connection .

Third Year

Paper: 3BCA8 Data Communication

UNIT :- 1

Data communication, Introduction, Components, data representation, data flow and basic model, serial & Parallel transmission, Modes of data transmission encoding. Unipolar, polar, Bipolar, Line & block codes.

Data compression : lossy & lossless techniques review of analog & digital transmission method.

UNIT :- 2

Multiplexing : Introduction & history, FDM, TDM, WDM, Synchronous & statistical TDM. Spread spectrum: Frequency hopping & direct sequence terminal handling & polling network switching technique circuit, Message, Packet & Hybrid.

UNIT :- 3

Physical layer introduction, Interface standards EIA – 232 – D RJ – 45, RJ 11, BNC connector & EIA – 449 digital interface connection specification & configuration. Modern types, features signal constellation block schematic connecting Devices active and passive hubs. Repeaters, bridges, two & three layer switches & gateway network topologies and their comparative study.

UNIT :- 4

Telephone network : components Local signaling and services digital subscriber line: ADSL, HDSL, SDSL, VDSL cable TV network for data transfer.

UNIT :- 5

Transmission Errors content Error, flow integrity error, error detection, error correction, bit error rate. Error detection & correction methods parity checking checksum error detection cycle Redundancy check, Hamming distance, interleaved codes. Block parity, convolution code hardware implementation, checksum.

Suggested Text Books:

1. Gupta Prakash C. "Data communication", PHI Learning
2. Forouzan, "Data communication and Networking", 5e, TATA Mc Graw
3. Godbole A., "Data Communication & Network", TMH
4. Miller, "Data Network and Communication", Cengage Delmar Learning
5. Stallings William, "Data & Computer Communication
6. Tanenbum A.S. "Computer Network", Pearson Education

Third Year

Paper: 3BCA8 Data Communication

Unit -1: Basics of Computer Network Computer Network: Definition, Goals, Structure; Broadcast and Point-ToPoint Networks; Network Topology and their various Types; Types of Network: LAN, MAN, WAN; Server Based LANs & Peer-to-Peer LANs; Communications Types: Synchronous, Asynchronous; Modes of Communication: Simplex, Half Duplex, Full Duplex; Protocols and Standards

Unit -2: Network Models Design Issues of the Layer, Protocol Hierarchy, ISO-OSI Reference Model: Functions of each Layer, Various Terminology used in Computer Network, Connection-Oriented & Connectionless Services, Internet (TCP/IP) Reference Model, Comparison of ISO-OSI and TCP/IP Model

Unit -3: Transmission Media Transmission Media, Guided Media (Wired) : Coaxial Cable: Physical Structure, Standards, BNC Connector, Applications, Twisted Pair : Physical Structure, UTP vs STP, Connectors, Applications, Fiber Optics Cable: Physical Structure, Propagation Modes (Single Mode & Multimode), Fiber Sizes, Connectors , Applications , Advantages & Disadvantages; Unguided Media(Wireless): Electromagnetic Spectrum for Wireless Communication, Propagation Methods, (Ground, Sky, Line-of-Sight); Wireless Transmission: Radio Waves, Infrared, Micro-wave; Wireless LANs (IEEE 802.11), Architecture, MAC Sub Layer, Frame Format, Frame Types; Bluetooth, Architecture (Piconet, Scatternet, Bluetooth, Layers), Applications

Unit -4: Network Connectivity Devices Categories of Connectivity Devices, Passive and Active Hubs, Repeaters, Bridges, Switches (2-Layer Switch, 3-Layer, Switch (Router), Gateways, Network Security Devices (Firewalls, Proxy Servers)

Unit -5: Components of LAN Network Interface Card (NIC), Network Adapters, Components of NIC, Functions of NIC, Types of NIC; Ethernet : Basic Features, Types of Ethernet, Different Framer Format: IEEE 802.3, IEEE 802.4, IEEE 802.5 Unit 6 : Internet Basics Internet:Growth, Architecture, Accessing, Internet Service Providers(ISP), Internet Addressing System:IP Address, DNS, URL; World Wide Web(WWW): Web Servers,Web Browsers, Search Engine; Concept of Intranet & Extranet.