BHUPENDRA NARAYAN MANDAL UNIVERSITY MADHEPURA

Syllabus for

Bachelor of Computer Application

SEMESTER-I
1BCA1-FUNDAMENTALS OF COMPUTERS
&
INFORMATION TECHNOLOGY

UNIT-I

Brief history of development of computers. Computer sysyem, Computer system characteristics. Capabilities and limitations. Types of computers-Analog, Digital, Hybrid General special purpose, Micro, Mini, Mainframe, Super, Generations of computers, Personal Computer(PCs) -IBM PCs, Characteristics, PC/PCXT/PCAT - configurations, Pentium and Newer PCs Specifications and main characteristics. Types of PCs- Desktop, Laptop, Notebook, Palmtop, Workstations etc. Their characteristics.
Basic components of a Computer system- control unit ALU THOSE WHO OPT 4BCA5(A). Input/ output functions and characteristics, Memory- RAM, ROM, EPROM, PROM and other types of memory.

UNIT-II

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 moniter - Digital , Analog. Size Resolution, Refresh Rate, Interlaced/Non Interlaced, Dot pitch, Video Standard -VGA, SVGA, XGA etc.
Printers- Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter. Sound card and speakers, storage fundamentals - primary Vs Secondary Data storage and Retrieval method - Sequential. Direct and index.
Sequential, Various Storage Devices, Magnetic Tape, Magnetic Disks, Cartridge Tape, Hard Disk Drives, Floppy Disks (Winchester Disk). Optical Disks. CD, VCD, CD-R, CDRW, Zip Drive.

UNIT-III

Need, Types of software- System Software, Application Software, System Software, Utility Program, Programming language, Assemblers, Compilers and Interpreter. Operating System - Functions, Types - Batch, Single, Multiprogramming, Multiprocessing. Programming languages- Machine, Assembly, High Level, 4GL,their merits and demerits, Application Software - Word Processing, Spreadsheet, Presentation Graphics, Data Base Manage-Ment Software, Characteristics. Uses and examples and area of Application of each of them, virus working principles. Types of Virus, Virus detection and Prevention, viruses on network.

UNIT-IV

Analog and Digital Signals, Modulations- Amplitude Modulation (AM), Frequency Modulation (FM), Phase Modulation (PM),

Communication Process, Direction of Transmissions Flow - Simple, Half Duplex, Full Duplex, Communication Software, Communication Protocols, Communication Channels - Twisted, Coaxial, Fiber Optic. Serial and Parallel Communication Modem - Working and Characteristics, Types of Connections - Dial up, Leased Lines, ISDN, Types of Network - 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 Gateways. Use of Communication in daily life.

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, **"Fundamental of Information Technology"**. Vikas publishing House, New Delhi.

1BCA2- COMMUNICATIVE ENGLISH

Objective: This Course is designed on a predominantly Communicative or interactive approach to the learning of English. This approach is based on the belief that language is not a body of Knowledge to be learnt but a Skill to be acquired. Student acquires the ability to use the language fluently effectively, Correctly, Confidently and naturally in real life situations that is to say, they Imbibe and internalize the language. However, the approach is to encourage the learners to formulate and express their ideas and offer Ample Scope for Creativity. The approach has been aimed at an Integrator development or the four basics Skills - Listing, Speaking, Reading and Writing.

FUNCTIONAL GRAMMAR

UNIT-I
Sentences : Simple, Compound, Complex, Assertive, Interrogative, Imperative, Exclamatory. Clauses: Co-ordinate, Sub-ordinate, Relative, Adverb, Comparative(Adverb+Adjective) Articles: Usage of 'A', 'AN', 'THE'. Preposition : Position of Preposition, Place Relations Time Relations and other relations.

UNIT-II
Functional Grammar:- Tenses : Simple Present, Progressive Perfect, Present Perfect, Progressive along- with Past Tense and Indications of futurity Reported Speech. Models : Will, Shall, Should, Would and others. Voice: Active and Passive.

UNIT-III

Reading, Comprehension written, Listening, Note taking Note Making.

UNIT-IV

Vocabulary words Commonly Miss Pelt word formation by Prefix Suffix.

UNIT-V

Literature : Lessons and Poems from B.N.M.Universities Madhepura 1st year Foundation Course book.

UNIT-VI

Nouns: Countable, Uncountable. Pronoun: Personal, Relative and others. Verb and Verb Structures (infinitives and gerundial), Linking Devices .

UNIT-VII

Adverbs and Adverb Phrases, Comparisons and Intensification Modifiers and adverbs. Adjective and Adjective Phrases.

UNIT-VIII

Synonyms Antonyms & Homonyms Diminutives and Derivatives. Jargons or Registers.

UNIT-IX

Precis writing, Paragraph, Curriculum Vitae/ Resume, Preparation Of questionnaire for Interview skills.

UNIT-X

Literature from prescribed Texts.

TEXT BOOKS :

"Written Communication in English " by Sarah Freeman Published by Orient Long man.

REFERENCE BOOKS :

Intermediate English Grammar by Raymond Williams
A Practical English Grammar by Thomson and Martinet
Vocabulary by Michael McCarthy and Felicity O'Dell
English Grammar by Jayanthi Dakshina Murthy
English Grammar by WS. Allen

1BCA3-PROGRAMMING METHODOLOGY
AND
C PROGRAMMING

UNIT-I

Program concept, Characteristics of programming, Various stages in Program Development Programming aids Algorithms, Flow Chart- Symbols, Rules for making Flow chart, Types of Flow chart, Advantage and Disadvantage, Pseudo codes, Decision Table, Programming techniques & tools Programming Techniques - Top down, Bottom up, Modular, Structured- features, Merits & Demerits, Comparative study, Programming Logic- Simple, Branching, Looping, Recursion, Cohesion & Coupling. Programming

Testing & Debugging & their Tools.

UNIT-II

Introduction & features of c, Structure of c program, Variables, Expressions, Identifiers, Keywords, Data Types, Constants, Operator and expression Operator : Arithmetic, Logical, Relational, Conditional and Bit wise Operators, Precedence and Associatively Output and library function Single character input/ output i.e. print( ) and scan( ), Library function - concepts, Mathematical & Character functions.

UNIT-III

If statement, if.......Else statement, Nesting of if.......Else statements, else if ladder, The operator, goto statement, statement, Compound statement, Loop controls, for, while, do-while loops, break. Continue, goto statement. ARRAY Single and Multi Dimensional Arrays. Array declaration and initialization of arrays.
Strings : declaration. Initialization functions.

UNIT-IV

The need and form of C functions. User defined and library function, Function arguments, Return values and nesting of function, Recursion, Calling of functions, Array as function argument, Scope and life of variables - local and global variable, storage class specified - auto. Extern, static, register.

UNIT-V

Defining structure, Declaration of structure variable, Accessing structure members, Nested structures, Array of structure, Structure assignment, Structure as function argument, Function that return structure, Union.

UNIT-VI

Basic of pointers and operators, Pointers and function, Array of pointers. Pointer and strings, Pointers to structure, Pointers within structure, Introduction - Dynamic memory allocation, The process of memory allocation, Malloc( ) function, sizeof( ) operator, Function fscan( ), Function realloc( ).

UNIT-VII

Introduction - File handling, File structure. File handling function, File types. Streams. Text, Binary, File system basics. The file pointer, Opening a file. Closing file. Writing a character, Reading a character. Using fopen( ), gete( ), pure( ) and Using feof( ). Working with string fput( ) and fgets( ), Standard streams in C, Flushing a steam, Using free tread( ) and fwrite( ), Direct access file, fseek( ) and random access I/O, fprintf( ) and fscanf( ), Command line arguments.

UNIT-VIII

The pre- processor, #define, defining functions like macros, #error, #include, conditional compilation directives i.e. #if. # else, # elif and #idef & under, using defined, # line, # pragma, the # & # # pre-processor operator.

UNIT-IX

Interoduction - ROM BIOS and direct access to colour graphics on your PC. Register for passing arguments to BIOS. **ROUTINE :** function int86( ), graphics on your PC. Initialise graphics mode, function used in graphics, bitwise operator extended keyboards code.

TEXT AND REFERENCE BOOKS :

Y.Kanetkar, " Pointers through C ". Y.Kanetkar, " TSR through C".
E.Balaguruswamy, " Programming in C ". TMH Publications
Gottfried, Schaums Outline Series, " Programming with C ".
TMH Publications Mahapatra, " Thinking in C ". PHI Publications
S.K. Basardra, 'Computer today' Galgotia Publications.
Alxies Leon & Mathews learn " Fundamentals of information Technology " Vikas Publishing House New Delhi.
Peter Julif " Program Design " PHI Publications
V.K.Jain, " O Level Programing Concept & System, " BPM Publications.

1BCA4–COMPUTER PRACTICALS

UNIT-I

MS Windows : Introduction to M.S. Windows : Features of Windows; Various versions of Windows & its use Working with My Computer & Recycle bin; Desktop. Icons and Windows Explorer; Screen description & working styles of Windows; Dialog Boxes & Toolbars, Working with Files & Folders: Shortcuts & Accessories and Windows Settings using Control Panel; Start button & Program Lists: Installing new Hardware & Software.

UNIT-II

MS Word Basics : Introduction to MS Office ; Introduction to MS Word : 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

Advance 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.

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.

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.

UNIT-VI

Programming In C Language.

TEXT AND REFERENCE BOOKS :

Microsoft Office 2000, 8 in 1 by Joe Habraken, Prentice Hall of India.

SEMESTER-II
2BCA1 MATHEMATICS-1
(ADVANCE CALCULUS AND MATRICES)

UNIT-I

Definition of a function as a map between sets. Definition of a real valued function of a real variable. Graphical representation of a function as a curve in 2-dimensions. Equations of a straight line and of a curve. Tengent to a curve.Equation of tangent to a curve. Representation of real numbers function on a computer. Graphical representation of a function on a computer screen.

UNIT-II

Derivative as tangent to a curve. Continuity and differentiability. Definition of a limit, and derivative as a limit. Derivative as a linear map. Derivatives of products and composites; Leibniz rule and Chain rule. Applications to maxima and minima. Second derivative and its use for testing extrema. Applications to root finding.

UNIT-III

Integral as anti- derivative. Relation to integral as area under a curve integral as a limit. Integration by parts change of variables formula. Elementary techniques of numerical quadrature.

UNIT-IV

Higher derivatives. Statements of Taylor's theorem in one variable. Euler's Maclaurin expansion and its applications to numerical computing. Difficulties in numerical computation of derivatives as limits.

UNIT-V

Ordinary differential equation. Statement of peano's existence theorem. Calculation of numerical solution by Euler's method. Basics of Ruge-kutta methods.

UNIT-VI

Matrix algebra: addition and multiplication of matrix. Inverse of a non-singular matrix. Determinant of a matrix. Testing non singularity using determinants. Solution of systems of linear equations using matrices and determinants.

(NUMERICAL METHODS)

UNIT-I

Representation of numbers on a computer Differences between floating point and real arithmetic. Different types of errors and their estimates.

UNIT-II

Representation of a function on a computer. Discretisation, Table look-up interpolation. Extrapolation function evaluation. Numerical differentiation. Numerical Quadrature.

UNIT-III

Root finding and numerical maxima and minima. Solutions of non-linear equations. Conjugate gradient method.

UNIT-IV

Solutions of linear equations. Gaussian elimination. Iterative methods. Eigen value problems.

UNIT-V

Integration of ordinary differential equations. Picard's method of successive approximation. Euler's method. Runge-kutta methods. Predictors corrector methods.

UNIT-VI

Introduction to integration of partial equations.

UNIT-VII

Introduction to integration of stochastic tie differential equations.

TEXTS AND REFERENCE BOOKS :

S.S.SASTRY, "ENGINEERING MATHEMATICS ", Prentice Hall of India.
S.S.SASTRY, " NUMERICAL METHODS (volume 2)", Prentice Hall of India.

2BCA2-DATA STRUCTURE

UNIT-I

The concept of data structure, Abstract data structure, Analysis of Algorithm, The concept of list Introduction to stack & Primitive operation on Stack, Stack as an abstract data type, Multiple Stack, Stacks application: Infix, Postfix, Prefix and Recursion, Introduction to queues. Primitive Operations on the Queues, Queue as an abstract data type, Circular queue, Dequeue, Priority queue, Applications of queue.

UNIT-II

Introduction to the Linked List of Stacks, Basics operations on linked list, stack and queues as a circular linked list. Header nodes, Doubly Linked list. Circular Linked list. Stack & Queues as a Circular Linked List. Application of Linked List.

UNIT-III

TREES_Basics Terminology, Binary Trees. Tree Representations as Array & Linked List, Basic operation on Binary tree, traversal of binary tree. In order, pre order & post order, Application of Binary tree, Threaded binary tree. B-tree & Height balanced tree, B+ & B* tree, 2-3 trees, Binary tree representation of trees. Counting binary trees.

UNIT-IV

Sequential searching, Binary Search. Insertion Sort. Selection Sort. Quick Sort, Bubble Sort, Heap Sort. Comparison of Sorting methods.

UNIT-V

Hash Table, Collision resolution Techniques. Introduction to Graphs. Definition. Terminology Directed, Undirected & Weighted graph. Representation of graphs. Graph traveral-Depth first & Breadth first search, spanning Tree minimum spanning Tree Shortest path algorithm.

TEXT & REFERENCE BOOKS

FUNDAMENTALS OF DATA STRUCTURE, By: S.Sawhney & E.Horowitz.

DATA STRUCTURE, By: Trembley & Sorrenson.

DATA STRUCTURE, By: Lipschuists (Schaum's outline series McGraw Hill Publication).

FUNDAMENTALS OF COMPUTER ALGORITHM, By: Ellis Horowitz : and Sartaj Sawhney.

2BCA3-OBJECT ORIENTED PROGRAMMING WITH C++

UNIT-I
Overview of c++: Object oriented programming. Introducing C++ classes Concept of object oriented programming. 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 object, 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++, 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. Constructing two dimensional Array 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 sort hand 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. Inheritance & 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 function & Polymorphism: Virtual function, Pure Virtual function. 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 I/AGS, Clearing format flags. An

overloading form of self ( ), Examining the formatted flags, Setting all "lags Using Width ( ) precision ( ) and fill ( ), Using manipulators to format I/O. Creating your own manipulators.

SEMESTER-III
3BCA1-DIGITAL COMPUTER ORGANIZATION
UNIT-I
Data types and Number systems, Binary number system. Octal & Hexa-decimal number system. 1's & 2's complement, Binary Fixed-Point Representation. Arithmetic operation on Binary numbers, Over-flow & underflow, Floating Point Representation, Codes, ASCII, EBCDIC codes, Gray code, Excess-3 & BCD, Error detection & correcting codes.

UNIT-II
Logic Gates, AND, OR, NOT GATES and their Truth tables, NOR, NAND & XOR gates, 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 & subtractor, Flip-flops, RS, D, J K & T Flip-flops. Shift Registers, RAM and ROM, Multiplexer, Demultiplexer, Encoder, Decoder, Idea about Arithmetic Circuits, Program Control, Instruction, Sequencing.

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 AND REFERENCE BOOKS:
BARTEE, "DIGITAL COMPUTER FUNDAMRNTALS
" MALVINO, " DIGITAL COMPUTER ELECTRONICS
" MORRIS MANO, " COMPUTER SYSTEM ARCHITECTURE ".

3BCA2-DATABASE MANAGEMENT SYSTEMS

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, and Advantage & Disadvantage 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, Centralization, Specialization, Aggregation, Reducing ER diagram to of Prodtionship set, Attributes, Mapping constraints, Keys, Entity- Relationship diagram (E.R diagram), Strong & weak entities, Centralization, Specialization, Aggregation, Reducing ER diagram to tables.

UNIT-II

Set theory concepts and fundamentals: Relations, Domains, Attributes, Tuple, Concepts of keys: Domains, Attributes Tuples, concepts of keys: candidate keys: candidate key, Primary key, Alternate Key, Super key, Foreign key. Fundamental integrity rules : Entity integrity, referential integrity, Extension & intention, Relational Algebra: Select, Project, Cross Product, Different type of Joins i.e theta join, equi join, natural join, outer join, set operations. Structured query language (SQL), Codd's Rules.

UNIT-III

Functional Dependencies, Good & Bad Decomposition, Anomalies as a database. A consequences of bad design. Universal Relation. Normalization- First, Second, Third and BNCF Normal Forms Multi- values Dependency, Join Dependency & forth, Fifth Normal Form.

UNIT-IV

Basic Concepts :- INDEXING & HASH ING. Indexing 13+ tree index files, B- tree index files, I- Lashing, Static hash functions Dynamic Hash functions index definition in SQL : multiple key Access.

UNIT-V

Failure Classification, the Storage Hierarchy. Transaction Model log Based Recovery, Buffer Management, Shadow Paging.

TEXT AND REFERENCE BOOKS:

"DATABASE MANAGEMENT SYSTEM" by Leon & Leon, Vikas Publication "DATABASE SYSTEM CONCEPTS " by Henry F Korth & Abraham Silberscharts.

" AN INTRODUCTION TO DATABASE SYSTEM "
by Bipin C.Desai
" AN INTRODUCTION TO DATABASE SYSTEM "
by C.J.Date

3BCA3-OPERATING SYSTEM

UNIT-I
Definitions, function 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, Multiple-Processor Scheduling Real- Time Scheduling, Critical Section Problem.

UNIT-III
Semaphores, Classical Problem Of Synchronization, Monitors, Atomic Transactions, System Model, Deadlock Characterizations, Method for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock, Combined approach to Deadlock.

UNIT-IV
Logical versus physical address space, Swapping, Contiguous Allocation, Paging, Segmentation, Segmentation With Paging, Virtual Memory, Demand Paging, Performance of Demand Paging, Page Replacement, Page Replacement Algorithms.

UNIT-V
Allocation of Frames, Thrashing, Other Consideration, Demand Segmentation, I/O system-Overview, I/O Hardware, Application I/O Interface, Kernel I/O Subsystem, Performance, Disk Structure, Disk Scheduling, Disk Management, Swap Space Management, Disk reliability, Stable Storage Implementation.

TEXT AND REFERENCE BOOKS:-
OPERATING SYSTEM CONCEPTS by Silberschatz & Galvin, Addison Wesley Publication OPERATING SYSTEM CONCEPTS & DESIGN by Milan Milen Kovie, TMH Publication.

3BCA4-COMPUTER PRACTICALS CONCEPTS

UNIT-I
Implementation Of DBMS on MS-Access
UNIT-II

Introduction, History & versions of DOS, DOS basics-physical structure of disc, drive name. FAT, file & directory structure and naming rules, booting process, DOS system files, DOS commands, Internal- DIR, MD, CD, RD, COPY, DEL, REN, VOL, DATE, TIME, CLS, PATH, TYPE, etc, External- CHKDSK, XCOPY, PRINT, DISKCOPY, DISKCOMP, DOSKEY, TREE, MOVE, LABEL, APPEND, FORMAT, SORT, FDISK, BACKUP, EDIT MODE ATTRIB, HELP, SYS etc. Executable V/S Non executable files in DOS.

UNIT-III

Basic Features, Advantages, Basic Architecture of UnixiLinux system, Kernel, Shell, Linux File system-Boot block. Super block, Inode table, data blocks, How Linux access files, storage files, Linux standard directories, Commands for files and directories cd, Is, cp, md, rm, mkdir, rmdir, more, less, creating and viewing files, using cat, checking disk free spaces. Linux system startup and shut-down process. Understanding shells, Processes in Linux, connecting processes with pipes, Redirecting input output, Background processing, managing multiple processes, changing process priority. Scheduling of processes at command batch commands, ki II, ps, who, sleep, printing commands, find, sort, Cal. Banner, touch, file, file related commands-ws, sat, cut, grep, dd, etc, Mathematical commands-be. expr, factor, units, vi, J oe, vim editor, introduction and captures of GNU C compiler.

SEMESTER-IV
4BCA1-PROGRAMMING WITH VISUAL BASIC.NET

UNIT-I

Introduction to. NET Framework, Understanding web programming a web browser and web server, How to create HTML pages and HTML Forms, Role of .NET in Web Development. .NET Framework and platform, base classes, XML as .NET meta language, Relation with COM. Overview of CLR, .NET class Frame. An overview of .NET Components.IDE of VB.NET-Menu bar, toolbars, project explorer, toolbox, Properties window, Form designer, Form layout, Immediate window. Visual Development And Event-Driven Programming-Event Driven Programming Methods and events. Concept of VB.NET project, types of VB.NET projects, Opening and saving the projects, Elements of the user interface, Designing the user interface, Creating forms and code modules, Running the application, Grouping controls. Customizing The Environment-Editor tab, format tab, general tab, docking tab, environment tab, Working with Forms, Loading, Showing and hiding forms, Control-

ling one form within another.

UNIT-II

Variables-Declaring variables, Types of variables Converting variables types, User-define data types. Special values, Forcing variables declarations, Scope and Lifetime of a variables, Constants, Arrays, types of array, control array, Collections, Procedures, subroutines, functions, Control flow statement and conditional statements, Loop statements, Designing menus and popup menus. Programming menu commands, Using access and short keys, Using message box input box, Using standard modules.

UNIT-III

The Text Box Control- Text selection, Search and replace operations, The List box and Combo box controls, Indexing with the List box controls, Searching a Sorted list, The scroll bar and slider controls, Using the common dialog controls, Color common dialog box, Font common dialog box, The file open and save com-Mon dialog boxes, Print dialogbox. Help common dialog box, The file controls.

UNIT-IV

Classes, instances, objects, Encapsulation and abstraction, Derived classes and base classes, class in. object linking and embedding (OLE), OLE at runtime, OLE control, Graphics with Vi-dual Basic .NET, Form, picture box and image box controls Sizing images, loading and saving images, Coordinate system, scale properties and
methods, The drawing methods: drawing text, drawing, drawing boxes, filling, Drawing curves, manipulating pixels. Specifying colors. Using timer controls, Multiple Document Interface (MDI), MDI-built-in capabilities, Patent-child menus, Objects and instances. Loading and unloading of child forms, New and open commands.

UNIT-V

Window management, Graphics device interface, Accessing the Win 32 API from VB.Net, Dynamic - link - libraries (DLL), Declaring a DLL procedure, Special considerations when calling DLL with special date types, The bitmaps and graphics API function, system API functions programming and Interfacing with officer 97. Programming with objects, The New VB for applications (VBA) Editor, Automating Office application. Spell - checking documents, Working with excel objects.

TEXT & REFERENCE BOOK:-

Application Development Using Visual Basic and NET by Robert J . Oberg, Peter Thorsteinson, Dana L. Wyatt

4BCA2-MATHEMATICS-II

(DISCRETE MATHEMATICS)

UNIT-I
Statements, logical connectives, truth table, tautologies, contradictions, logical equivalence, Applications to everyday reasoning.

UNIT-II
An axiom system for the sentence calculus. Truth table 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 predicated calculus. Application to everyday reasoning.

UNIT-IV
Sets and classes. Relations. Equivalence relation and equivalence classes. Partial order relation, club and glb. Trees and lattices. Mappings: injunctive, subjective and objective mappings. Cardinality. Finite and infinite sets.

UNIT-V
Definition and basic properties of semi groups and groups, rings, integral domains and fields.

UNIT-VI
Vector spaces and algebras, Linear dependence and independence. Bases. Linear transformations and their representation as matrices. Invertible linear transformation and invertible matrix, Geometrical interpretation of determinant of a 2x2 matrix.

TEXT AND REFERENCE BOOKS:-
S.S.SASTRI- "ENGINEERING MATHEMATICS ", Prentice Hall of India Bernard kolman, Robert C. Busby, Sharon Ross, " Discrete Mathematical Structures Engineering Mathematics "

4BCA3-RELATIONAL DATABASE MANAGEMENT SYSTEM & ORACLE

UNIT-I
Different Data base model, RDBMS components- Kernel, Data dictionary, Client/Server Computing and Oracle. Overview of oracle architecture- Oracle files, System and User process, Oracle Memory, role of DBA. System data base object, protecting data.

UNIT-II
SQL Plus, Oracle data types, Creation, Insertion, Updating Deletion of tables, Modification of structure of tables, Removing, Deleting,

Dropping of Tables. Data Constrains, Column level & table Level Constrains Null, Unique Key, Default key, Foreign key, Check Integrity constrains. Defining different constraints on the table Defining Integrity Constraints in the ALTER TABLE Command, Select Command, Logical Operator, Range Searching, Pattern Matching, Oracle Function, Grouping data from Tables in SQL, Manipulation Data in SQL.

UNIT-III

Joining Multiple Tables (Equi joins), Joining a Table to itself (self joins), Sub queries Union, intersect & Minus Clause, Creating view, Renaming the Column of a view, Granting Permissions, Updation, Selection, Destroying view, Permission on the objects created by the user, GRANT statement, Object Privileges. Referencing a table belonging to another user, Revoking the permission given, indexes.

UNIT-IV

PL/SQL, SQL & PL/SQL differences, block structure, variables, constants, datatype. Assigning database values to variables, Select.........INTO, cursors. Using flow control and loop statement. GOTO statement, Error handling. Built-in exceptions, User defined exceptions. The Raise-Application-error procedure, Oracle transaction, Locks. Implicit and Explicit locking.

UNIT-V

Procedure & Functions- Concept, creation, execution, advantages, syntax, deletion, Triggers- Concept. Use How to apply database triggers, type of triggers, syntax. Deleting, import, Export, Oracle backup and recovery.

TEXT & REFERENCE BOOKS:

Ivan Bayross, " SQL, PUSQL, BPB Publications "
Liebschuty, " The Oracle Cook Book ", BPB Publication
Michael Abbey, Michael J Corey, " Oracle a Beginners guide " TMH Publication Oracle Unleashed (Chapter 1, 2, 3, 4, 5, and 9)

4BCA4-COMPUTER PRACTICALS

UNIT-I
GUI Programming With Visual Basic .NET
UNIT-II
Implementation of ORACLE Statements.

SEMESTER-V
5BCA1-COMPUTER NETWORKS

UNIT-I
Needs and Advantage - network, Types - Server based, peer, hybrid, Server types. Network Topology - Bus, Star, Ring, Star Bus, Star Ring, Mesh. Network protocols - Hardware protocols, Software protocols. Selecting and design the network for an organization.

UNIT-II
Signal Transmission - Digital signalling, Analog signalling, Bit Synchronization. Baseband and Broadband transmission. Network media types - properties & Specialties. Comparative study. Network adapters - working principle, Configuration and Selection.

UNIT-III
OSI and IEEE 802 model, Ethernet- working principle, 10 & 100 MBPS Ethernet Token Ring working principle, cabling, Hops, FDDI, Apple talk & ARC networking and their components, Network Scaling-No. Of Computer, distance, Software, Speed, Special requirements.

UNIT-IV
Networking Technologies - Fiber channel, ATM, Network connectivity - Hubs, repeaters, bridges multiplexers. Internet Connectivity Routers and Brouters, gateways, CSUs / DSUs.

UNIT-V
Various Server Clients Hardware & Software, Simple Installation and Configuration of windows NT, Novel Network Server and Clients. Simple network administration.

TEXT AND REFERENCE BOOKS:
James Challis Charles Perkins, Matthew Strebe "Networking Essentials": Study Guide Mouse second Edition BPB Publication.
SK.Basandra & S.Jaiswal, "Local Area Network", Galyotia Publications Gerd E.Keiser,
"Local Area Network".
Andrew & Tanenbaum, "Computer Network".
William Stalling, "Data and Computer Communication" Prakash C Gupta, "Data Communication".

5BCA2-JAVA PROGRAMMING

UNIT-I
C++ Vs JAVA, JAVA and Internet and WWW.JAVA Support

Systems. JAVA environment. JAVA Program structure, Tokens, Statements, JAVA Virtual machine, Constant & Variables. Data Types. Declaration of Variables, Scope of variables. Symbolic constants, Type casting, Operations : Arithmetic, Relational, Logical, Assignments, Increment and Decrement, Conditional, Bitwise Special, Expressions & its evaluation. If Statements, if...else...Statements, Nesting of if...else....Statements, else....if Ladder, Switch? Operators, Loops while, Do, For, Jumps in Loops, Labeled Loops.

UNIT-II
Defining a Class. Adding Variables and Methods, Creating Objects. Accessing Class Members Constructor. Methods Overloading, Static Members, Nesting of Methods. Inheritance: Extending a class, Overriding methods, Final Variables and Methods, Final Classes, Finalize Methods, Abstract methods and classes, Visibility Control.

UNIT-III
Array: One Dimensional & two Dimensional. String, Vectors, Wrapper Classes, Defining Interface Extending Interface, Implementing Interface, Accessing Interface Variable. System Packages. Using System Packages, adding a class to a packages, Hiding Classes.

UNIT-IV
Creating Threads. Extending the Threads class, Stopping and Blocking a Thread. Life Cycle of a Thread. Thread Methods, Thread Exceptions. Thread Priority. Synchronization. Implementing the unable Interface.

UNIT-V
Local and Remote Applets Vs Applications writing Applets, Applets Life Cycle, Creating an Executable Applet, Designing a webpage, Applet Tag, Adding Applet to HTML file, Running the Applet, Passing Parameters to Applet, Aligning the Display, HTML Tags & Applets, Getting Input from the user.

TEXT AND REFERENCE BOOKS:
E.Balaguruswamy, " Programming in java ", 2nd Edition. TMH Publications.
Peter Norton, " Peter Norton Guide to java Programming " Tec media Publication.

5BCA3-INTERNET & E-COMMERCE

UNIT-I
Internet Evolution, Protocols, Interface Concepts, Internet Vs Intranet, Growth of Internet, ISP, Connectivity - Dial-up, Leased line, VSAT

etc. URLs Domain names, Protocols, Application, E-mail, Concepts, POP and WEB Based E-mail, merits, address, Basics of Sending & Receiving, E-mail Protocols, Mailing List, Free E-mail Services.

UNIT-II

Data Transmission Protocols, Client/Server Architecture & its characteristics, FTP & its usages. Telnet concept, Remote Logging, Protocols, Terminal Emulation, Massage Board Internet chatting - Voice chat, Text chat.

UNIT-III

WORLD WIDE WEB (WWW) - History, Working, Web Browsers, its functions, Concept of search Engines, Searching the HTTP, URLs, Web Servers, Web Protocols, Web Publishing Concepts, Domain name Registration, Space on Host Server for Website, HTML, Design tools, HTML editors, Image editors, Issues in Website creations & Maintains. FTP software for upload Website. Concepts of Hypertext, Versions of HTML, Elements of HTML syntax, Head & Body Sections, Building HTML documents, Inserting texts, Images, Hyperlinks, Backgrounds and Color controls. Different HTML tags, Table layout and presentation, Use of font size & Attributes, List types and its tags. Of Frames and Forms in web pages.

UNIT-IV

JavaScript Overview, JavaScript and the WWW, JavaScript Vs VB Script, JavaScript versions, Script element, Inline JavaScript, Including JavaScript. Functions : Functions introduction, Calling functions, JavaScript Comments: Comments overview, When to comment, Types of comments Variables: Variables overview, declaring variables, Types of variables, Casting variables, Alert box Expressions: Arithmetic operators, Assignments operators. Logical operators, Expressions and precedence Statements: If statements, For statement, While statement. Break / Continue.

UNIT-V

E-Commerce an introductions, Concepts, Technology in E-Commerce, Internet & E- Business, advantage of E-Commerce, Applications, Feasibility & various constraints.

TEXT & REFERENCE BOOK:

V.K. Jain, "O Level Module-M 1.2-Internet & web page designing, "BPB Publications. Alexis Leon and Mathews Leon, "Internet for Everyone,"
Vikas Publishing House Pvt. Ltd. New Delhi.

5BCA4–COMPUTER PRACTICALS

UNIT-I

Java Programming
UNIT-II
HTML, DHTML, VB Script & JavaScript Writing.

SEMESTER-VI
6BCA1-SYSTEM ANALYSIS AND DESIGN

UNIT-I
System Concept: Definition, Characteristics, Elements of system, Physical and abstract system, open and close 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 From Design: Input and output form design methodologies, menu, screen design, layout consideration.

UNIT-IV
System fasting & quality: System testing and quality assurance, steps in system implementation and software maintenance, system security. Disaster/recovery and ethics in System development, threat and risk analysis.

UNIT-V
Organisation of EDP: Introduction. Job Responsibilities & duties of EDP Personnel's-EDP manager, System Analysis. Programmers, Operators etc. Essential features in EDP Organization. Selection of Data Processing Resource Purchase lease, rent-advantages and disadvantages.

TEXT AND REFERENCE BOOK:

System Analysis & Design by VK Jain, Dreamtech Press

Modern System Analysis & Design by A. Hoffer, F. George.

S.Valaciah Low Priced Pearson Education Information Technology

& Computer Application by V.K.Kapoor,

Sultan Chand & Sons, New Delhi.

6BCA2-PRINCIPLE OF MANAGEMENT & FINANCIAL ACCOUNTING PRINCIPLES OF MANAGEMENT

UNIT-I

Principles of management Evolution, development and modern philosophy of management, Principles of management, Nature and function of management, Planning, Organizing, Directing, Communicating, Controlling and Coordinating: Motivation and Leadership.

UNIT-II

Reporting- Capabilities. Principle type of Reports, Presentation on Modes, Function reporting system, Information and its uses, Characteristics of information. Flow of information. Management information system- Introduction, Characteristics, Needs, Different views of MIS, Designing, Placement of MIS, Pitfalls in Designing an MIS, Computer based MIS- Advantages & Disadvantages.

UNIT-III

Introduction & types of Decision, Levels of Decision making Decision support system- Concepts, Types, Software, Components, Needs, Building, Problems, Examples, Impact.

UNIT-IV

Human Resources management: Concepts & functions, Job analysis and role description. Organization Design and structure, Centralization and Decentralization, Brief introduction to project management and its tools/techniques, chant chart, PERT/CPM.

UNIT-V

Computer Application 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 Application in Materials Management. Insurance and Stock-broking. Production and planning Control, Purchasing, Banking, Credit and Collection, Warehousing.

TEXT & REFERENCE BOOKS:

S.K. Basandra, "Computers Today,"Galgotia Publications Koontz, H.U.Essentials of Management, TMH Publications.

FINANCIAL ACCOUNTING

UNIT-I
The basic financial Accounts, types of accounts, Rules of Entries of transaction, Journal. Cash Book-Types, Format of Cash book, Balancing of Cash Book, Subsidiary books- Purchase, Sales, Purchase return and sales return, Ledger, posting of entries.

UNIT-II
Trial Balance, Rectification of errors adjustment entries. Depreciation and Inflation.

UNIT-III
Principles of Cost Accounting, Valuation of Stocks Allocation of Overheads, Methods of material issues.

UNIT-IV
Pay roll department, Preparation of Pay roll, Preparation of wage record, Methods of payments of wages. Overview of computerized method for payroll preparation.

UNIT-V
Inventory account and store record, inventory or stock control and cost accounting, Department demand and supply method of stock control. Classification and condition of material Report on material handling. Overview of computerized accounting software.

TEXT & REFERENCE BOOKS:
Mazda, Engineering Management, 1st Edition, 2000, Addisen Wesley Dr. SP Gupta, Management Accounting I.M. Pandey, Financial Management, 8th Edition, 1999, Vikas Publication.

6BCA3-MULTIMEDIA TOOLS AND APPLICATIONS

UNIT-I
Multimedia: Needs and areas of use, multimedia development team &skills, Mac V/s Windows Platform Multimedia building blocks, Making simple multimedia with PowerPoint. Various stages in Multimedia product design.
Text- Plain & formatted text, RTF & HTML texts, Text preparation tools, Conversion to and from of various text formats, using standard software, Object Linking and Embedding concept, Brief Intro to fonts editing and design tools, Understanding & using text effects.
Images- Types of graphics- Vector and Raster, various attributes of

images, Various Image file format BMP, on EPS, CIF, PEX, PIC, IPG, TGA and TIF format, Tools for file formats conversions, Compression of images and its effect to quality and storage size, Brief knowledge of image compression techniques-RLE, LZW, JPEG and wavelet compression, Image processing software tools.

UNIT-II

Sound: Sound and its Attributes, Sound and its effect in multimedia, Analog V/s Digital sound, Basics of digital sounds Sampling, Frequency, Sound Depth, Channels, PC Sound card standards- FM synthesis, wave table, midi and MP3 files and devices, 3D sounds, Capturing and Editing sound on Windows Sound Recorder. Introduction to some sound editing software.

UNIT-III

Animation, Basics of animation, Principle and use in multimedia, Hardware & Software resources requirement for animation, Effect of resolutions, pixel depth, Images size on quality and storage, Types of animation, Steps for creating a generic animation, Brief knowledge of 2-D AND 3-D animation techniques and software- animation pro, 3D studio & Paint Shop pro animator.

UNIT-IV

Video: Basic of Video- Analog and Digital Video, Types of Video, Hardware & Software resources requirement for Video on PC, Digitization of analog video to digital video, Interlacing and no interlacing, Brief note on various video standards- NTSC, PAL, SECAM, HDTV, Introduction to video capturing Media & instrument- Videodisk, Camcorder, Introduction to digital video compression techniques and various file formats- AVI, MJPG, MOVE, Real Video. Brief Introduction to video editing and movie making tools- Quick time, video for windows & Adobe premier.

UNIT-V

Authoring tools for Multimedia: Key factors of selecting CD based or Web-based multimedia, various plug-ins for Web. HTML and Multimedia, Designing tips text and images for web. Planning and distribution of a multimedia project. Stages in designing & producing multimedia products for CD and web, Testing of product, distribution of multimedia product, various formats of CD's and DVD's.

TEXT AND REFERENCE BOOKS:

Multimedia: Making it Work(4th Edition)- by Tay Vaughan, Tata McGraw Hills.
Multimedia in Action- James E Shuman- Vikas Publishing House.

6BCA4(A)

COMPUTER PRACTICALS

UNIT-I
Accounting Practice in Tally
UNIT-II
Multimedia Tools & Applications.

6BCA4(B) GUIDELINES FOR SUBMISSION OF BCA PROJECTS AND SUMMER ASSIGNMENTS

All the candidates of BCA are required to submit a project- report based on the work done by him/her during the project assignment period.

THE GUIDE
The Guide for BCA would be a person having at least MCA/B.Tech/ M.Sc.(CS)/M.Sc(IT) or equivalent. A guide cannot guide more than five projects of B.N.M.U. at a given time Number of students in a project group will not be more than three for BCA.

PROJECT EVALUATION GUIDELINES
(A) To be done by the college
The evaluation of Project will be done on the basis of following heads.

Presentation	50% of total marks
Thesis/Project report	50% of total marks

(B) To be done at Examination Centre by External Examiner
The evaluation of Project will be done on the basis of following heads:
Viva 50% of total marks.
Thesis/Project report 50% of total marks.

SUMMARY/ABSTRACT
All students must submit a summary/abstract separately with the project report. Summary, preferably, should be of about 3-4,pages. The content should be as brief as is sufficient enough to explain the objective and implementation of the project that the candidate is going to take up. The write up must adhere to the guidelines and should include the following:
"   .Name/Title of the Project
"   .Statement about the Problem
"   .Why is the particular topic chosen?
"   .Objective and scope of the Project
"   .Methodology(including a summary of the project)
"   .Hardware & Software to be used
"   .Testing Technologies used
"   .What contribution would the project make?

TOPIC OF THE PROJECT-

This should be explicitly mentioned at the beginning of the Synopsis. Since the topic itself gives a peep into the project to be taken up, candidates is advised to be prudent on naming the project. This being the overall impression on the future work, the topic should corroborate the work.

OBJECTIVE AND SCOPE:

This should give a clear picture of the project. Objective should be clearly specified. What the project ends up to and in what way this is going to help the end user has to be mentioned.

PROCESS DISCRIPTION:

The process of the whole software system process, to be developed; should be mentioned in brief. This may be supported by DFD's/Flowcharts to explain the flow of the information.

RESOURCES AND LIMITATION:

The requirement of the resources for designing and developing the proposed system must be given. The resources might be in form of the hardware/software or the data from the industry. The limitation of the proposed system in respect of a larger and comprehensive system must be given.

CONCLUSION:

The write-up must end with the concluding remarks briefly describing innovation in the approach for implementing the project, main achievements and also any other important feature that makes the system stand out from the rest.

The following suggested guidelines must be followed in preparing the Final project Report:

Good quality white executive bond paper A4 size should be used for typing and duplication. Care should be taken to avoid smudging while duplicating the copies. Page Specification (Written paper and source code)

Left margin- 3.0cms
Right margin- 2.0cms
Top margin- 2.54cms
Bottom margin- 2.54cms
Page numbers

All text pages as well as program source code. Listing should be numbered at the bottom centre of the pages. Normal Body text: Font Size: 12, Time New Roman, Double Spacing, Justified. 6 point above and below para spacing Paragraph Heading font size 14, Times New Roman, Underlined, Left Aligned. 12 point above & below spacing. Chapter Heading Font Size: 10, Times New Roman, Centre Aligned. 30 point above and below spacing. Coding Font Size:

10, Courier New, Normal Submission of Project Report to the University: The students will submit his/her project report in the prescribed format. The Project Report should include.

1. One copy of the summary/abstract.
2. One hard copy of the Project Report.
3. Soft copy of project on Floppy/CD in a thick envelope pasted inside of the back cover of the project report.
4. The Project Report may be about 75 pages (excluding coding)

FORMAT OF THE STUDENT PROJECT REPORT ON COMPLETION OF THE PROJECT

Cover Page as per format

Acknowledgement Certificate of the project guide/Centre Manager as at Annexure III

Certificate of the Company/Organization (for direct candidates)

Synopsis of the Project Main Report

" .Objective & Scope of the Project
" .Theoretical Background
" .Definition of Problem
" .System Analysis & Design vis-à-vis User Requirements
" .System Planning(PERT Chart)
" .Methodology adopted, System Implementation & testing
" .Details of Evaluation, etc.
" .Output Screen Design
" .Printout of the reports
" .Hardware & Software used
" .System Maintenance & Cost and benefit Analysis
" .Detailed Life Cycle of the Project.

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