

**DETAILED SYLLABUS
FOR
BACHELOR OF COMPUTER APPLICATIONS (BCA)
(FOR BATCH 2002-2005)**



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SYLLABUS FOR BCA COURSE FOR BATCH 2002-2005

COURSE OBJECTIVES

There are two main objectives of this degree course.

- a) To prepare computer professionals who can be directly employed, and
- b) to train students to a level where they can readily compete for seats for advanced degree courses like MCA, MSc(IT), etc.

The course has been designed keeping in mind the desirable characteristics of a competent computer professional. We have identified these characteristics to be the following.

1. Communication skills
2. Ability to work in a team
3. Logical and numerical ability
4. Knowledge of computers, consisting of
5. Strong fundamentals of:
 - ☐ Programming methodology
 - ☐ LAN and Internet
 - ☐ Databases
 - ☐ Application packages.

Strict standards would be maintained, to ensure quality.

Since computing is an applied field, it has been decided to increase the weightage of computer labs to 40% of the theory. Thus each student will have 5 theory and 2 practical courses in each semester, except for the last semester, which would be wholly devoted to a project.

Students from Biology, Commerce and Arts stream who have not taken mathematics at the +2 stage may register for the BCA course. Since mathematics at the +2 stage is a compulsory requirement for admission to AICTE approved MCA courses, those students who wish to opt for these MCA courses but have not taken mathematics at the +2 stage should clear the mathematics paper at the +2 stage from

any recognized Board. The University is trying to make arrangements with the National Open School to enable this to be done at the University's Study Institutes, in a convenient way.

The student has the option to graduate with more papers in mathematics if he/she so wishes.

ENTRANCE TEST

Question asked in the test will be based on mathematics, logical abilities and general awareness etc. The test will be objective type.

**SCHEME FOR BACHELOR OF COMPUTER APPLICATIONS (BCA)
(2002 – 2005)**

FIRST YEAR

SEMESTER I

| SUBJECT CODE | SUBJECT NAME | MARKS |
|--------------|---|-------|
| 1BCA1 | FUNDAMENTALS OF COMPUTING-I | 100 |
| 1BCA2 | PROGRAMMING METHODOLOGY AND C PROGRAMMING | 100 |
| 1BCA3 | DIGITAL ORGANIZATION | 100 |
| 1BCA4 | PRINCIPLES OF MANAGEMENT | 100 |
| 1BCA5 | COMMUNICATIVE ENGLISH –I | 100 |

SEMESTER II

| SUBJECT CODE | SUBJECT NAME | MARKS |
|--------------|--------------------------------------|-------|
| 2BCA1 | FUNDAMENTALS OF COMPUTING - II | 100 |
| 2BCA2 | LINUX AND ADVANCED PROGRAMMING IN C. | 100 |
| 2BCA3 | DATA BASE MANAGEMENT SYSTEMS | 100 |
| 2BCA4 | ACCOUNTING AND FINANCIAL MANAGEMENT | 100 |
| 2BCA5 | COMMUNICATIVE ENGLISH-II | 100 |

**SCHEME FOR BACHELOR OF COMPUTER APPLICATIONS (BCA)
(2002 – 2005)**

SECOND YEAR

SEMESTER III

| SUBJECT CODE | SUBJECT NAME | MARKS |
|--------------|---|-------|
| 3BCA1 | OBJECT ORIENTED PROGRAMMING WITH C++ | 100 |
| 3BCA2 | SYSTEM ANALYSIS & DESIGN | 100 |
| 3BCA3 | DATA STRUCTURES | 100 |
| 3BCA4 | FUNDAMENTALS OF MATHEMATICS-I (ADVANCED CALCULUS AND MATRICES) | 100 |
| 3BCA5 | OPERATING SYSTEM | 100 |

SEMESTER IV

| SUBJECT CODE | SUBJECT NAME | MARKS |
|--------------|--|-------|
| 4BCA1 | GRAPHICAL USER INTERFACE PROGRAMMING WITH VISUAL BASIC | 100 |
| 4BCA2 | COMPUTER NETWORKS | 100 |
| 4BCA3 | INTERNET & E-COMMERCE | 100 |
| 4BCA4 | FUNDAMENTALS OF MATHEMATICS-II (DISCRETE MATHEMATICS) | 100 |
| 4BCA5 | A. MULTIMEDIA TOOLS AND APPLICATIONS OR B. FUNDAMENTALS OF MATHEMATICS-III (NUMERICAL METHODS) | 100 |

**SCHEME FOR BACHELOR OF COMPUTER APPLICATIONS (BCA)
(2002 – 2005)**

THIRD YEAR

SEMESTER V

| SUBJECT CODE | SUBJECT NAME | Marks |
|--------------|--|-------|
| 5BCA1 | ORACLE RDBMS | 100 |
| 5BCA2 | JAVA PROGRAMMING | 100 |
| 5BCA3 | WILL BE DECLEARED AT THE STARTING OF SEM. | 100 |
| 5BCA4 | A. WILL BE DECLEARED AT THE STARTING OF SEM. OR B. FUNDAMENTALS OF MATHEMATICS-IV (COUNTING PRINCIPLES, PROBABILITY AND STATISTICS) | 100 |
| 5BCA5 | WILL BE DECLEARED AT THE STARTING OF SEM. | 100 |

SEMESTER VI –

6 MONTH’S PROJECT WORK

NOTE :-

- ❑ For passing the examination minimum 40% marks must be scored in each passing head individually.
- ❑ For passing the semester, the aggregate marks must be at least 45% in theory & Computer Lab groups separately.
- ❑ For the purpose of award of merit or division only the marks obtained in theory groups of all semester together shall be considered.
- ❑ To avoid obsolescence the subjects 5BCA3 and 5BCA4 will change from year to year, and will be announced at the end of semester IV.

**SCHEME FOR BACHELOR OF COMPUTER APPLICATIONS (BCA)
(2002 – 2005)**

Practical & Continuous Evaluation

SEMESTER I

| | | |
|-------|---|-----|
| 1BCA6 | INTERNAL ASSESSMENT AND TERM WORK | 100 |
| 1BCA7 | COMPUTER LAB I: BASIC KNOWLEDGE OF OPERATING SYSTEMS, WORD, AND EXCEL | 100 |
| 1BCA8 | COMPUTER LAB II : C PROGRAMMING | 100 |
| 1BCA9 | PROFESSIONAL PERSONALITY SKILLS | 50 |

SEMESTER II

| | | |
|--------|-----------------------------------|-----|
| 2BCA6 | INTERNAL ASSESSMENT AND TERM WORK | 100 |
| 2BCA7 | COMPUTER LAB III: ‘C’ ON LINUX | 100 |
| 2BCA8 | COMPUTER LAB IV: ACCESS | 100 |
| 2BCA9 | PROFESSIONAL PERSONALITY SKILLS | 50 |
| 2BCA10 | SUMMER ASSIGNMENT | 100 |

SEMESTER III

| | | |
|-------|-----------------------------------|-----|
| 3BCA6 | INTERNAL ASSESSMENT AND TERM WORK | 100 |
| 3BCA7 | COMPUTER LAB V: C++ | 100 |
| 3BCA8 | COMPUTER LAB VI :DATA STRUCTURES | 100 |
| 3BCA9 | PROFESSIONAL PERSONALITY SKILLS | 50 |

**SCHEME FOR BACHELOR OF COMPUTER APPLICATIONS (BCA)
(2002 – 2005)**

Practical & Continuous Evaluation

SEMESTER V

| | | |
|--------|---|-----|
| 4BCA6 | INTERNAL ASSESSMENT AND TERM WORK | 100 |
| 4BCA7 | COMPUTER LAB VII: VISUAL BASIC | 100 |
| 4BCA8 | COMPUTER LAB VIII: INTERNET E-COM & WEB PAGE DESIGNING | 100 |
| 4BCA9 | PROFESSIONAL PERSONALITY SKILLS | 50 |
| 4BCA10 | MINOR PROJECT | 100 |

SEMESTER IV

| | | |
|-------|-----------------------------------|-----|
| 5BCA6 | INTERNAL ASSESSMENT AND TERM WORK | 100 |
| 5BCA6 | COMPUTER LAB IX: JAVA | 100 |
| 5BCA7 | COMPUTER LAB X: ORACLE | 100 |
| 5BCA8 | PROFESSIONAL PERSONALITY SKILLS | 50 |

SEMESTER VI

| | | |
|-------|---------------------------------|-----|
| 6BCA1 | MAJOR PROJECT | 500 |
| 6BCA2 | INTERNAL ASSESSMENT & TERM WORK | 100 |

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1BCA1 - FUNDAMENTALS OF COMPUTING-I**UNIT – I**

Brief history of development of computers, Computer system concepts, 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, 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 monitor -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 methods - 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, CD-RW, Zip Drive.

UNIT – III

Need, Types of Software - System software, Application software, System Software - Operating System, Utility Program, Programming languages, Assemblers, Compilers and Interpreter, Operating Systems - 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 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

Analog and Digital Signals, Modulations - Amplitude Modulation (AM), Frequency Modulation (FM), Phase Modulation (PM), Communication Process, Direction of Transmissions Flow - Simplex, 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 - Dialup, 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.

UNIT –V

Introduction, History & versions of DOS.DOS basics- Physical structure of disk, 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.

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 Publications

1BCA2-PROGRAMMING METHODOLOGY AND C PROGRAMMING**UNIT – I**

Program Concept, Characteristics of Programming, Various stages in Program Development Programming aids Algorithms, Flow Charts - Symbols, Rules for making Flow chart, Types of flowchart, Advantage & Disadvantage, Pseudocodes, 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 Associativity of Operators, Type conversion in expression, Basic input/output and library functions Single character input/output i.e. getch(), getchar(). getch(), putchar(),Formatted input output i.e. printf() and scanf(), Library functions - concepts, Mathematical & Character functions.

UNIT – III

If statement, If.....Else statement, Nesting of If...Else Statement, else if ladder, The ?: operator, goto statement, Switch statement, Compound statement, Loop controls, for, while, do-while loops, break, continue, goto statement, ARRAYS 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.

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.
- ❑ Alexis Leon & Mathews Leon, “**Fundamentals of Information Technology**”, Vikas Publishing House, New Delhi.
- ❑ Peter Juliff, “**Program Design**”, PHI Publications
- ❑ V.K.Jain, “**O Level Programming Concepts & Systems**”, BPB Publications.

1BCA3-DIGITAL 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, Overflow & 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 & Full Adder, Full subtractor, Flip-flops - RS, D, JK & 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 & REFERENCE BOOKS :

- *BARTEE, "DIGITAL COMPUTER FUNDAMENTALS "*
- *MALVINO, " DIGITAL COMPUTE ELECTRONICS "*
- *MORRIS MANO, "COMPUTER SYSTEM ARCHITECTURE "*

1BCA4-PRINCIPLES OF MANAGEMENT**UNIT-I**

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

UNIT-II

Management information system - Introduction, Characteristics, Needs, Different views of MIS, Designing, Placement of MIS, Pitfalls in Designing an MIS

Reporting - Capabilities. Principle, Type of Reports, Presentation on Modes, Function reporting system, Information and its uses, Characteristics of information, flow of information.

UNIT-III

Introduction & types of Decision

Levels of Decision making

Decision support system - Concepts, Types, Software, Components, Needs, Building, Problems, Examples, Impact.

UNIT-IV

Concepts, Artificial Intelligence and Expert system

Basics of Expert system

Building of Expert system

Merits and Demerits of Expert system

Application of Expert system

UNIT-V

Computer Application in Business - Need and Scope, Cost and Budgetary Control, Inventory Control System, Payroll and Personnel Record, Banking, Insurance and Stockbroking, Mathematical Models and Operations Research.

TEXT & REFERENCE BOOKS :

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

1BCA5-COMMUNICATIVE ENGLISH - I

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 of the four basic skills - Listening, 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 Prepositions, 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
- ❑ Modals : 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 Misspelt
- ❑ Word formation by prefix suffix

UNIT-V

Literature : Lessons and Poems from M.P. Universities' 1st year Foundation Course book and Written Communication by Sarah Freeman

TEXT BOOKS:

- ❑ **“English Language and Indian Culture”** - M.P.Universities' 1st year Foundation Course published by M.P.Hindi Granth Academy, Bhopal [Complete]
- ❑ **“Written Communication in English”** by Sarah Freeman published by Orient Longman [Units I and II only]

REFERENCE BOOKS:

- ❑ *A Practical English Grammar* by Thomson and Martinet
- ❑ *English Grammar* by W.S.Allen

1BCA9-PROFESSIONAL PERSONALITY SKILLS**UNIT-I****ORIENTATION**

- ❑ Optimism
- ❑ Motivation - Types & Factors

UNIT-II**UNDERSTANDING ENGLISH LANGUAGE**

- a. Phonetics
- b. Grammar
- c. Vocabulary Enhancement
- d. Conversation English
- e. Removal of Hesitation – Working On Fluency.

UNIT – III**COMPREHENSIVE COMMUNICATION**

- a. Communication & Its Process
- b. Types Of Communication
- c. Barriers To Communication
- d. Development Of Personalized Communication Plan
- e. Oral Communication Skills
 1. Effective Public Speaking
 2. Art Of Speaking Effectively
- f. Oral Presentation Skill

2BCA1-FUNDAMENTALS OF COMPUTING-II**UNIT-I**

Interconnection of units, Processor to memory communication, I/O to processor communication, Interrupt structure, Multi programming, Processor features, Reduced Instruction set Computers (RISC), Virtual Memory

UNIT-II

Computer Graphic Applications, Display Devices, Raster Scan Devices, Input Devices for Interactive graphics, Programmer Model of Interactive Graphics System

UNIT-III

Introduction to System Investigation, System Development Process, Programme Development, Development Flow Chart, Structured Programming, Pseudo Code, Software Engineering, Trend in Software Engineering, CASE Tools

UNIT-IV

Introduction to Information System, Transaction Processing and Information Report System, Managerial Decision making, Decision Support System, Expert System

UNIT-V

Computer Applications in Business, Computer Applications in Project Management, Computer in Personnel Administration, Information System for Accounting, Marketing and Manufacturing, Computer Applications in Materials Management, Production planning and Control, Purchasing, Credit and Collection, Warehousing, Science and Technology , Multimedia

TEXT REFERENCE BOOKS:

- ❑ V Raja Raman, “Computer Fundamentals ”
- ❑ S.K.Basandra, “Computers Today “, Galgotia Publications

2BCA2-LINUX AND ADVANCED PROGRAMMING IN C**UNIT-I**

Basic Features, Advantages, Basic Architecture of Unix/Linux 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, ls, 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, kill, ps, who, sleep, Printing commands, find, sort, Cal, banner, touch, file, file related commands-ws, sat, cut, grep, dd, etc, Mathematical commands- bc, expr, factor, units.

vi, joe, vim editor, Introduction and features of GNU C compiler.

UNIT-II

Basic of pointers and operators, Pointers and function, Array of pointers, Pointer and strings, Pointer to structure, Pointers within structure, Introduction – Dynamic memory allocation, The process of memory allocation, Malloc() function, Sizeof() operator, Function free(), Function realloc()

UNIT-III

Introduction – File handling, File structure, File handling function, File types, Streams, Text, Binary, File system basics, The file pointer, Opening a file, Closing a file, Writing a character, Reading a character, Using fopen(), getc(), putc(), and fclose(), Using feof(), Working with string fputs() and fgets(), Standard streams in C, Flushing a stream, Using fread() and fwrite(), Direct access file, fseek() and random access I/O, fprintf() and fscanf(), Command line arguments

UNIT-IV

The preprocessor, #define, defining functions like macros, #error, #include, conditional compilation directives i.e. #if, #else, #elif and #ifdef & undef, using defined, #line, #pragma, the # & ## preprocessor operator

UNIT-V

Introduction - 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”*.
- ❑ Bryan Pfaffenberger, *“Linux Command–Instant Reference”* – BPB Publications (ISBN 81 – 7656-319-6).
- ❑ *“Linux complete”* – BPB Publications

2BCA3-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, 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, 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), 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 & BCNF Normal Forms, Multivalues Dependency, Join Dependency & forth Fifth Normal Form

UNIT-IV

Basic Concepts - INDEXING & HASHING, Indexing : B+ tree Index Files, B-tree Index Files, Hashing : 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 & 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

2BCA4-ACCOUNTING AND FINANCIAL MANAGEMENT**UNIT-I**

The Basic-Financial Accounts, Types of Accounts, Rules of Entries of Transaction, Journal, Ledger, Posting of Entries Balance

The Balance Sheet and Profit - Loss Statement

UNIT-II

Cash Book- Types, Format of Cash Book, Balancing of Cash Book

Subsidiary Books- Purchase, Sales, Purchase Return and sale return

Depreciation and Inflation

UNIT-III

Principles of Cost Accounting, Valuation of Stock, Allocation of Overheads, Standard Costing, Various Costing

UNIT-IV

Pay roll department, Preparation of pay roll, Preparation of wage record

Discuss computer method

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

Discuss computer method-overview of computerized accounting

TEXT & REFERENCE BOOKS :

- *Mazda, Engineering Management, 1st Edition, 2000, Addison Wesley*
- *Dr. S.P. Gupta, Management Accounting*
- *I.M. Pandey, Financial Management, 8th Edition, 1999, Vikas Publication*

2BCA5-COMMUNICATIVE ENGLISH-II**OBJECTIVES:**

It has been observed that linguistic competence is essential to understand the basic concepts of various subjects. Therefore, this course is designed with an aim to make learners proficient and efficient in the use of English Language. A sincere effort is being made to expose the learners to the four basic linguistic skills - Listening, Writing, Speaking and Reading

UNIT-I

- Nouns: Countable, Uncountable
- Pronoun: Personal, Relative and others
- Verb and Verb structures (infinitives and gerundials)
- Linking Devices

UNIT-II

- Adverbs and adverb phrases, Comparisons and Intensification
- Modifiers and adverbs
- Adjectives and Adjective Phrases

UNIT-III

Synonyms Antonyms & Homonyms

- Diminutives and Derivatives
- Jargons or Registers

UNIT-IV

- Precis writing
- Paragraph
- Curriculum Vitae/ Resume
- Preparation of questionnaire for Interview skills

UNIT-V

Literature from prescribed Texts

TEXT BOOKS:

- ❑ *English Language and Scientific Tempe-M.P.Universities' 2nd year Foundation Course published by M.P.Hindi Granth Academy, Bhopal, [Complete]*
- ❑ *Written Communication in English by Sarah Freeman Published by Orient Longman [Units 3 and 4]*

REFERENCE BOOKS:

- ❑ *Intermediate English Grammar by Raymond Williams*
- ❑ *Vocabulary by Michael McCarthy and Felicity O'Dell*
- ❑ *English Grammar by Jayanthi Dakshina Murthy*

2BCA9-PROFESSIONAL PERSONALITY SKILLS**UNIT-I****COMPREHENSIVE COMMUNICATION**

- ❑ What is Communication & its Process ?
- ❑ Types Of Communication
- ❑ Barriers To Communication
- ❑ Development Of Personalised Communication Plan
- ❑ Types Of Communication Skills
- ❑ Oral Communication Skills - The Art Of Speaking Affectively .
- ❑ Written communication skills
- ❑ Principles of written skills .
- ❑ Grammar, usage and mechanics of writing
- ❑ Nonverbal Communication Skills And How To Master Them
- ❑ Written Presentation Skills
 - Preparation of resume, Biodata and CV & difference between all three .
 - Report writing, letter writing, memo writing and drafting .
 - How to write an exam
- ❑ Listening Skills
- ❑ Reading Skills
- ❑ How to cultivate the habit of functional reading

UNIT-II**MEMORY & RETENTION TECHNIQUES**

- ❑ Mind mapping
- ❑ Notes taking in the class
- ❑ Listening Skills
- ❑ Reading Skills
- ❑ Revision Techniques

UNIT - III**CONCENTRATION ENHANCEMENT TECHNIQUES**

- ❑ Sandwich Technique
- ❑ Sriyantra
- ❑ Meditation

UNIT-IV

EXAMINATION TECHNIQUES

- ❑ How to Write an Exam ?
- ❑ Presentation Exam Secrets
- ❑ Difference Between College & Competative Exams

UNIT-V**KNOWING YOUR SELF**

- ❑ SWOT analysis – Where are you now ?
- ❑ BCG matrix – Where do you want to be ?
- ❑ Personality - Internal & External dimensions

UNIT – VI**CONVERSATION IN ENGLISH****3BCA1-OBJECT ORIENTED PROGRAMMING WITH C++****UNIT-I**

Overview of C++ : Object oriented programming, Introducing C++ classes, Concepts 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 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, 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 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, 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 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
- Balguruswamy, “C++ ”, TMH Publication
- M Kumar “*Programming in C++*”, TMH Publications
- R. Lafore, “*Object Oriented Programming C++* ”
- G. Blaschek, “*Object Oriented Programming C++* ”

3BCA2-SYSTEM ANALYSIS AND DESIGN

UNIT-I

SYSTEM CONCEPTS: Definition Characteristics, Organization, Elements of System, Physical and abstract system, open and Closed system, man made information systems .

SYSTEM DEVELOPMENT LIFE CYCLE: Recognition of need, Feasibility study, Analysis Design, implementation, consideration system planning and control for system success

UNIT-II

SYSTEM PLANNING AND INITIAL INVESTIGATION: Base for planning in system, dimensions of planning, determining users requirements and analysis, fact finding determination of feasibility .

TOOLS OF STRUCTURED ANALYSIS: Logical and Physical models, context, diagram, data dictionary, data diagram system structured charts system model pseudo codes, decision tree, decision tables, HIPO chart, Gantt charts, Warries diagram .

UNIT-III

FEASIBILITY STUDY: System performance constraints, identification of system objective, steps of feasibility report

COST / BENEFITS ANALYSIS: Data analysis cost / benefit analysis categories determination and system proposal.

UNIT-IV

SYSTEM DESIGN: Logical and Physical design methods, form driven mythologies IPO and HIPO charts, structured walk through audit considerations, processing controls, data validation, case studies of design .

UNIT-V

INPUT / OUTPUT AND FORM DESIGN: Input and output form design methodologies like prompts, menu, screen design, layout consideration, zoning box design .

SYSTEM TESTING & QUALITY : System testing and Quality assurance, implementation and software maintenance .

SYSTEM SECURITY: Security, Disaster / recovery and ethics in system development, threat and risk analysis .

TEXT & REFERENCE BOOKS :

- ❑ E. M. Awad, “*System analysis and design* ”
- ❑ J. Senu, “*Analysis and design of information system* ”
- ❑ Ashok Kumar Sharma, “*Analysis, Design and Implimentation of Information Systems*”, Vikas Publishing House
- ❑ Lucas, “*The Analysis design and implementation of information* ”
- ❑ J.F. Garald and A.F. Garald, “*Fundaments of System Analysis*”.

3BCA3-DATA STRUCTURES

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, post fix, 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, Basic operations on linked list, Stacks and queues as a circular linked list, Header nodes, Doubly Linked List, Circular Linked List, Stacks & Queues as a Circular Linked List, Application of Linked List.

UNIT-III

TREES - Basic Terminology, Binary Trees, Tree Representations as Array & Linked List, Basic operation on Binary tree, Traversal of binary trees:- In order, Preorder & post order, Application of Binary tree, Threaded binary tree, B-tree & Height balanced tree, B+ & B* trees, 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 Traversal-Depth first & Breadth first search, Spanning Trees, minimum spanning Tree, Shortestpath 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

3BCA4-FUNDAMENTALS OF MATHEMATICS-I **(ADVANCED 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. Equation of a straight line and of a curve. Tangent to a curve. Equations of tangent to a curve. Representation of real numbers 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. Statement of Taylor's theorem in one variable. Euler-Maclaurin expansion and its applications to numerical computing. Difficulties in numerical computation of derivatives as limits.

UNIT – V

Ordinary differential equations. Statement of Peano's existence theorem. Calculation of numerical solution by Euler's method. Basics of Runge-Kutta methods.

UNIT - VI

Matrix algebra: addition and multiplication of matrices. 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.

TEXTS AND REFERENCE BOOKS :-

- S.S.SASTRY, “ENGINEERING MATHEMATICS ”

3BCA5-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, 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 Allocating, 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 & REFERENCE BOOKS :-

- ❑ **OPERATING SYSTEM CONCEPTS** by Silberschatz & Galvin, Addison Wesley Publication
- ❑ **OPERATING SYSTEM CONCEPTS & DESIGN** by Milan Milen Kovic, TMH Publication

3BCA9-PROFESSIONAL PERSONALITY SKILLS**UNIT-I**

SPECIFIC PRESENTATION SKILLS

- ❑ Presentation in a meeting or seminar - with transparencies, slides and charts
- ❑ Combination Techniques for Audio and Visual presentation

UNIT-II

READING SKILLS

UNIT-III

ENTERTAINMENT & RELAXATION TECHNIQUES

UNIT-IV

APTITUDE TEST

- ❑ Likert Scale Test
- ❑ b. Semantic Differential Scale Test

UNIT-V

ATTITUDE DEVELOPMENT –

- ❑ Attitude Controlling Factors
- ❑ Path Towards Optimism
- ❑ Feel Good Factor

UNIT-VI

PERSONALITY PROJECTION (PART 1)

- ❑ Dimension Of Personality
- ❑ Goal Development
- ❑ Vision

UNIT-VII

CONVERSATION IN ENGLISH

4BCA1–GRAPHICAL USER INTERFACE PROGRAMMING WITH VISUAL BASIC

UNIT-I

IDE of VB - 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 project, types of VB project, 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, Controlling one form within another

UNIT-II

Variables -Declaring variables, Type of variables Converting variables types, User-defined data types, Special values, Forcing variables declarations, Scope and lifetime of a variable, Constants, Arrays, types of array, control array, Collections, Procedures, subroutines, functions, Control flow statements and conditional statements, Loop statements, Designing menus and popup menus, Programming menu commands, Using access and shortcut keys, Using message box and 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 common dialog boxes, Print dialog box, 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 VISUAL BASIC, Form, picture box and image box controls Sizing images, loading and saving images, Coordinate systems, 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, Parent-child menus, Objects and instances, Loading and unloading of child forms, New and open commands

UNIT-V

Windows management, Graphics device interface, Accessing the Win32 API from VB, Dynamic-link-libraries (DLL),Declaring a DLL procedure, Calling a DLL procedure, Special considerations when calling DLL with special data types, The bitmaps and graphics API functions, System API functions

Programming and Interfacing with Office 97 -

Programming with objects, The New VB for applications (VBA) Editor, Automating office applications, Spell-checking documents, Working with excel objects

TEXT & REFERENCE BOOKS :-

- ❑ *Evangelos Petroutsos, “ Mastering Visual Basic 6”, BPB Publications.*
- ❑ *Reeta Sahoo & G. B. Sahoo, “Beginner's Guide to Visual Basic 6”, Khanna Publishing House*
- ❑ *Peter Norton's Guide to Visual Basic 6*
- ❑ *Mohammd Azam “Programming in Visual Basic 6.0”, Vikas Publishing*
- ❑ *Peter Wright, “Beginning Visual Basic 6”, Shroff Publishers*
- ❑ *David Jung, “Visual Basic 6 Super Bible”, Techmedia Publication*

4BCA2-COMPUTER NETWORKS**UNIT-I**

Needs and Advantages - 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 signaling, Analog Signaling, Bit synchronization, Baseband and Broadband transmission, Network Media types- properties & specialties, comparative study, Network adapters – working principals, configuration and selection

UNIT-III

OSI and IEEE 802model, Ethernet – working principal, 10 & 100 MBPS Ethernet, Token Ring working principle, cabling, Hops, FDDI, Apple talk & ARCnet-Working and their components, Network Scaling-No. of computers, 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, Novell NetWare-Server and clients. Simple network administration.

TEXT & REFERENCE BOOKS :

- James Chellis Charles Perkins, Matthew Strebe “*Networking Essentials:Study Guide MCSE*”, Second Edition, BPB Publications.
- S.K.Basandra & S. Jaiswal, “*Local Area networks*”, Galgotia Publications
- Gerd E. Keiser, “*Local Area networks*”
- Andrew & Tanenbaum, “*Computer Network* ”
- William Stallings, “*Data and Computer Communication*”
- Prakash C Gupta, “*Data Communication*”

4BCA3-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, Portals, 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 Web, HTTP, URLs, Web Servers, Web Protocols.

Web publishing Concepts, Domain name Registration, Space on Host Server for Web site, HTML, Design tools, HTML editors, Image editors, Issues in Web site creations & Maintaince, FTP software for upload web site.

Concepts of Hypertext, Versions of HTML, Elements of HTML syntax, Head & Body Sections, Building HTML documents, Inserting texts, Images, Hyperlinks, Backgrounds and Colour controls, Different HTML tags, Table layout and presentation, Use of font size & Attributes, List types and its tags.

Use of Frames and Forms in web pages.

UNIT-IV

Javascript Overview, Javascript and the WWW, Javascript vs. VBScript, Javascript vs. Java, 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, Assignment operators, Logical operators, Expressions and precedence

Statements: If statement, For statement, While statement, Break/Continue

UNIT-V

E - Commerce An introduction, Concepts, Technology in E-Commerce, Internet & E-business, Advantage of E-Commerce. Applications, Feasibility & various constraints.

TEXT & REFERENCE BOOKS :

- 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

4BCA4-FUNDAMENTALS OF MATHEMATICS - II (DISCRETE 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.

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

TEXTS AND REFERENCE BOOKS:-

- S.S.SASTRY, Bernard Kolman, Robert C. Busby, Sharon Ross, “Discrete Mathematical Structures Engineering Mathematics ”

4BCA5(A)-MULTIMEDIA TOOLS AND APPLICATIONS**UNIT-I**

MULTIMEDIA: AN INTRODUCTION, TEXT, IMAGES & ITS PROCESSING TOOLS : Needs and areas of use and develop Multimedia *software*, multimedia development team & skills, Mac V/s Windows Platform, Basic Tools for development of Multimedia applications, multimedia building blocks, Making simple multimedia with popular applications. Stages in multimedia design: Planning, Content Analysis, Instructional Design, Preparation of media elements, Integration of media elements Authoring, evaluation.

Text – plain text and formatted text, Hyper Text Markup language (HTML), conversion of text formats, object linking and embedding concept and text preparation tools. Fonts editing and design tools, Text effects

Images – Types of graphics – Vector and Raster, Attributes of Images – resolutions, Images, sizes, Pixel Depth, Colour palates, Compression of images and its effect to quality and storage size, Various File format – BMP, DIB, EPS, CIF, PEX, PIC, JPG, TGA and TIF format the windows meta file formats, file formats conversions, Compression Techniques – RLE compression, LZW compression, JPEG fractal compression and wavelet compression, Processing Tools – techniques of capturing images and converting images, software tools for processing Images. Techniques of special text effects using various software.

UNIT-II

DIGITAL SOUND AND ITS CAPTURING AND EDITING TOOLS : Sound and its Attributes – Sound and its effect in multimedia Sampling of Sound, Frequency, Sound Depth, Channels in sound and their effects on quality and storage size estimation of space of a sound file, Sound card standards – FM synthesis cards, wave table cards, midi and MP3 files and devices, 3D sounds, Capturing and Editing sound, introduction to some sound editing softwares.

UNIT-III

COMPUTER ANIMATION ITS TECHNIQUES AND DEVELOPING TOOLS : Animation and its Basics – principles of Animations and its use in multimedia, computer System configuration and peripherals

requirements, Software for Animation, Effect of resolutions, pixel depth, Images size on quality and storage size, types of animations, steps for creating an generic animation. Animation Techniques – concept of key frame, tracing and path, 2D animation Techniques, tweaking; morphing, colour cycling, walk cycle wrap rotation, 3D Animation techniques, lofting, lighting, revolving, inverse kinematics, morphing, key framing. Various for crating animations like animation pro, 3D studio & Paint Shop pro animator.

UNIT-IV

DIGITAL VIDEO AND VIDEO MAKING TOOLS: Basics of Video – Analog and Digital Video, Types of Video, Computer System Configuration and peripherals required, digitization of Analog video to digital video, Problems due to interlacing and non-interlacing, Video standards – NTSC, PAL, SECAM, HDTV, Video capturing Media / Instrument – Videodisk, Camcorder., Compression techniques – Digital Video compression techniques, File Formats – AVI, MJPG, MOV, Real Video. Video editing and movie making tools – Quick time, video for windows & Adobe premier.

UNIT-V

MULTIMEDIA AUTHORING DESIGNING AND PRODUCING: Selecting and using and Authoring tool- Factor for selecting and authoring tools, Multimedia and internet selecting and using and authoring Tools for Web multimedia, various plug-ins for Web. IITML 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.

4BCA5(B) - FUNDAMENTALS OF MATHEMATICS - III (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 nonlinear 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. Predictor-Corrector methods.

UNIT-VI

Introduction to integration of partial differential equations.

UNIT-VII

Introduction to integration of stochastic differential equations.

TEXT & REFERENCE BOOKS :-

- S.S.Sastry, "Numerical Methods (Volume 2)"
- Numerical Methods In C

4BCA9-PROFESSIONAL PERSONALITY SKILLS

UNIT-I

PERSONALITY PROJECTION(II)

- Leadership Skills
- Creativity And Creative Brainstorming
- Interpersonal Dynamics

UNIT-II

□ EFFICIENCY & EFFECTIVENESS

UNIT-III

□ MANAGEMENT OF STRESS

UNIT-IV

□ MANAGEMENT OF TIME

UNIT-V

AWARENESS OF CURRENT AFFAIRS(PART-1)

- Chronic problems faced by India
- Recent Trends and Development in various fields and their consequences

UNIT-VI

CONVERSATION IN ENGLISH

5BCA1-ORACLE RDBMS**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, Updation, Deletion of tables, Modification of structure of tables, Removing, Deleting, Dropping of Tables, Data Constraints, Column level & table Level Constraints.Null, Unique Key, Default key, Foreign key ,Check Integrity constraints. 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),Subqueries Union, intereseet & 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

Procedures & 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, PL/SQL”, 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)*

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.

Operators : Arithmetic, Relational, Logical Assignments, Increment and Decrement, Conditional, Bitwise, Special, Expressions & its evaluation.

If statement, if...else... statement, Nesting of if...else... statements, else...if Ladder, Switch, ? operators, Loops – While, Do, For, Jumps in Loops, Labelled Loops.

UNIT-II

Defining a Class, Adding Variables and Methods, Creating Objects, Accessing Class Members, Constructors, 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

Arrays: One Dimensional & two Dimensional, strings, Vectors, wrapper Classes, Defining Interface Extending Interface, Implementing Interface, Accessing Interface Variable, System Packages, Using System Package, 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, Using Thread Methods,

Thread Exceptions, Thread Priority, Synchronization, Implementing the Runnable Interface.

UNIT-V

Local and Remote Applets Vs Applications, Writing Applets, Applets Life Cycle, Creating an Executable Applet, Designing a Web Page, Applet Tag, Adding Applet to HTML File, Running the Applet, Passing Parameters to Applets, Aligning the Display, HTML Tags & Applets, Getting Input from the User.

TEXT & REFERENCE BOOKS:

- ❑ E. Balaguruswamy, *“Programming in Java”, 2nd Edition, TMH Publications*
- ❑ Peter Norton, *“Peter Norton Guide to Java Programming”, Techmedia Publications*

5BCA3 - #####

SUBJECT AND THE DETAILED SYLLABUS OF THIS COURSE WILL BE DECLARED AT THE STARTING OF SEMESTER

5BCA4(A) - #####

SUBJECT AND THE DETAILED SYLLABUS OF THIS COURSE WILL BE DECLARED AT THE STARTING OF SEMESTER

**5BCA4(B)-FUNDAMENTALS OF MATHEMATICS - IV
(COUNTING PRINCIPLES, PROBABILITY AND STATISTICS)**

UNIT-I

Elementary counting principle - Product rule, Binomial and multinomial theorem, Stirling's formula, Principle of inclusion and exclusion, Permutations and combinations, Dearrangements Marriage problem.

UNIT-II

Recurrences and generating functions, Solution of recurrences using generating functions

UNIT-III

Discrete probability, Applications of counting principles to calculate discrete probability.

UNIT-IV

Definition of a random variable. Probability distribution and density function. Mathematical Expectation. mean, median, mode. Skewness and Kurtosis. Higher moments. Various probability distributions Normal, Binomial, Poisson, and Cauchy distributions, and their properties.

UNIT-V

Correlation and statistical independence. Conditional probability. Numerical generation of random variables with a given distribution Statement of the central limit theorem, and numerical test of the central limit theorem.

UNIT-VII

Basics of Sampling Theory Sample mean and variance. Sampling biases, with special reference o Internet sampling. Stratified sampling.

UNIT-VII

Introduction to Monte Carlo methods

TEXTS & REFERENCE BOOKS :-

- *Joe.L.Mott, Abraham Kandel, T.P.Baker, “Discrete Mathematics For Computer Science And Mathematicians ”*
- *S.S.Sastry, “Engineering Mathematics”*

**5BCA5 - #####
SUBJECT AND THE DETAILED SYLLABUS OF THIS COURSE
WILL BE DECLARED AT THE STARTING OF SEMESTER.**

5BCA9-PROFESSIONAL PERSONALITY SKILLS**UNIT-I**

MANAGEMENT & TECHNOLOGY

- Fusion of Management and Technology
- Importance of DataBase Management in Marketing and Sales Environment

UNIT-II

CONDENCED COMPREHENSIVE COMMUNICATION

UNIT-III

AWARENESS OF CURRENT AFFAIRS (PART II)

- Reading of English Newspaper

UNIT-IV

INTERVIEW TECHNIQUES

- Personal Interview Technique
- Group Discussion Technique
- Case Discussion Technique
- Mock Sessions