

**JODHPUR NATIONAL UNIVERSITY  
JODHPUR**

**Faculty of Computer Applications**

**B.C.A.**

<b>BCA I Semester</b>									
S No.	Code	Subject	Teaching Scheme			Max. Marks			
			L	T	P	Internal	External	Total	
1	BCA101	C Programming	3	1		30	70	100	
2	BCA102	Digital Electronics	3	2		30	70	100	
3	BCA103	Art of Communications	3	2		30	70	100	
4	BCA104	Computer Fundamentals	3	2		30	70	100	
5	BCA105	P C Software	3	1		30	70	100	
6	BCA106	C Programming Lab			6	30	70	100	
7	BCA107	P C Software Lab			6	30	70	100	700

<b>BCA II Semester</b>									
S No.	Code	Subject	Teaching Scheme			Max. Marks			
			L	T	P	Internal	External	Total	
1	BCA201	Advance C Programming	3	1		30	70	100	
2	BCA202	Information Technology Trends	3	2		30	70	100	
3	BCA203	Data Structure	3	2		30	70	100	
4	BCA 204	Web Designing	3	1		30	70	100	
5	BCA 205	Mathematics	3	2		30	70	100	
6	BCA206	Advance C Programming Lab			6	30	70	100	
7	BCA207	Web Designing Lab			6	30	70	100	700

BCA III Semester									
S No.	Code	Subject	Teaching Scheme			Max. Marks			
			L	T	P	Internal	External	Total	
1	BCA301	Object Oriented Programming - C++	3	1		30	70	100	
2	BCA302	Computer Organization and Architecture	3	2		30	70	100	
3	BCA303	Database Management System	3	2		30	70	100	
4	BCA304	Entrepreneurship development	3	2		30	70	100	
5	BCA305	Computer Graphics	3	1		30	70	100	
6	BCA306	Object Oriented Programming - C++Lab			6	30	70	100	
7	BCA307	Computer Graphics Lab			6	30	70	100	700

BCA IV Semester									
S No.	Code	Subject	Teaching Scheme			Max. Marks			
			L	T	P	Internal	External	Total	
1	BCA401	Java Core Programming	3	1		30	70	100	
2	BCA402	Relational Database Management System	3	1		30	70	100	
3	BCA403	System Analysis and Design	3	2		30	70	100	
4	BCA404	Principles of Management	3	2		30	70	100	
5	BCA405	Data Communication & Networking	3	2		30	70	100	
6	BCA406	Java Programming lab			6	30	70	100	
7	BCA407	RDBMS Lab			6	30	70	100	700

BCA V Semester									
S No.	Code	Subject	Teaching Scheme			Max. Marks			
			L	T	P	Internal	External	Total	
1	BCA501	Programming with VB.Net	3	1		30	70	100	
2	BCA502	Management Accounting and Economics	3	2		30	70	100	
3	BCA503	Marketing Management	3	2		30	70	100	
4	BCA504	Operating System	3	2		30	70	100	
5	BCA505	Multimedia Applications	3	1		30	70	100	
6	BCA506	Programming with VB.Net Lab			6	30	70	100	
7	BCA507	Multimedia Applications Lab			6	30	70	100	700

BCA VI Semester									
S No.	Code	Subject			Max. Marks				
					Internal	External	Total		
1	BCA610	Seminar			50	100	150		
2	BCA611	Project/Training			50	200	250	400	

BCA I Semester									
S No.	Code	Subject	Teaching Scheme			Max. Marks			
			L	T	P	Internal	External	Total	
1	BCA101	C Programming	3	1		30	70	100	
2	BCA102	Digital Electronics	3	2		30	70	100	
3	BCA103	Art of Communications	3	2		30	70	100	
4	BCA104	Computer Fundamentals	3	2		30	70	100	
5	BCA105	P C Software	3	1		30	70	100	
6	BCA106	C Programming Lab			6	30	70	100	
7	BCA107	P C Software Lab			6	30	70	100	700

### BCA101

### C Programming

#### UNIT I

About C, Evolution of C, Programming languages, Structure of a C program, Compiling a C program, Character set in C, Keywords in C, Hierarchy of operators, Basic data types, Qualifiers used with basic data types, Variables in C, Type declaration, Output function, Input function and format specifiers, arithmetic operators, Unary operators, Relational and logical operators.

#### UNIT II

Control statements, if statement, if else statement, for statement, while loop, do while statements, break statements, continue statements, switch statement, goto statement, ternary operators.

#### UNIT III

Arrays, advantages of arrays, types of arrays, array declaration, array initialization, accessing data from array, array inside the memory, multidimensional arrays.

#### UNIT IV

Character arrays, Array overflow, String Variables, Reading & writing strings, string handling functions.

## **UNIT V**

Functions, advantages of functions, declaring a function, calling a function, variables, passing arguments to a function, nested functions, passing array to functions, recursion in functions, Call by value and Call by reference.

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### **BCA102**

### **Digital Electronics**

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## **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, De Morgan'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.

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### **BCA103**

### **Arts of Communication**

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## **UNIT I**

Words and Sentences, Parts of speech, Articles, Verbs/ Tenses, Reported Speech, The passive,

## **UNIT II**

Introduction to Communication: -Meaning and Definition, Objectives, Principles of Communication, Scope, Limitations. Barriers to Communication.

## **UNIT III**

Communication process: - Meaning & Concept, Elements of Communication, and Media of Communication: Written, Oral, face-face, visual, audiovisual, computer based communication

## **UNIT IV**

Transactional Analysis: What makes us say what we say, the four life positions and analysis of transactions, perception and reality, the art of listening

#### **UNIT V**

Composition, Paragraph writing. Business Letters: Need and functions of business letters -Planning & layout of business letter - Types of business letters and letter writing, Application for employment and resume - Notices, Agenda and Minutes of the Meetings.

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### **BCA104**

### **Computer Fundamentals**

#### **UNIT I**

Introduction to Computer:-Definition, Characteristics. Generation of Computers, Capabilities and Limitations. Introduction to Operating System. Concept of Bios, Booting Files. Basic Components of a Computer System-Control Unit, ALU, Input/output functions and characteristics. Memory Introduction, Classifications-Volatile Memory and Non- Volatile , Flash Memory, ROM, RAM, EPROM, PROM, EEPROM other types of memory.

#### **UNIT II**

Input, Output and storage units, Computer Keyboard, Pointing Devices: Mouse, Trackball, Touch Panel, and Joystick, Light Pen, Scanners, Various types of Monitors, Touch-sensitive screens, Optical Recognition System, Pen based systems, Digitizers, MICR, OCR, OMR, Bar-code Reader, digital camera.

Hard Copy Devices:- Impact and Non- Impact Printers- Daisy Wheel, Dot Matrix, Line Printer, Chain Printer, Comb Printers, Non Impact Printers- DeskJet, Laser Printer, Thermal Transfer Printer, Barcode Printers, Electro static printers and plotters.

#### **UNIT III**

High Level Language and Low Level Language, Software and its different types- System Software, Application software. Hardware , Firmware, , Compiler, Interpreter and Assembler. File Allocation Table (FAT, FAT32 & NTFS). Introduction to algorithm and Flow chart: - Representation of an algorithm, flowchart symbols and levels of flow chart, rules, advantage and limitations of flowchart and pseudo code.

#### **UNIT IV**

Testing and Debugging Definition of testing and debugging, types of program errors, testing of programs, debugging a program for syntax and logical errors, difference between testing and debugging.

#### **UNIT V**

Booting process details of Dos and Windows DOS system files, Internal and External Commands, Difference between External and Internal Commands. Internal Commands MD, CD, RD, COPY CON, TYPE, DATE & TIME, VOLUME VERSION, REN, PROMPT, CLS, DIR/P/W, COPY , DEL Etc. External commands - FORMAT, DISKCOPY, DISKCOMP, XCOPY, CHKDISK, SCANDISK, HELP, DEBUG, PRINT etc.

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### **BCA105**

### **P C Software**

#### **UNIT I**

Introduction and history of Operating system, file and directory structures and naming rules, booting process, system files, internal and external files.

Windows XP/2000. Windows concepts, Features, Windows structure, Desktop, Taskbar, Start menu, My Computer, Recycle Bin, Windows Accessories- Calculator, Notepad, Paint, WordPad, Character Map, Windows Explorer, Entertainment, Managing Hardware & Software- installation of Hardware and Software, Using Scanner , System Tools, Communication, Sharing information between programs.

## **UNIT II**

Word processors, working with formatted text, Shortcut keys, Formatting documents: Selecting text, Copying & moving data, Formatting characters, changing cases, Paragraph formatting, Indents, Drop Caps, Using format painter, Page formatting, Header & footer, Bullets & numbering, Tabs, Forming tables. Finding & replacing text, go to (F5) command, proofing text (Spell check, Auto correct), Reversing actions, Macros, Inserting pictures, Hyperlinks, Mail merging, Printing documents.

## **UNIT III**

Spreadsheets, workbooks, creating, saving & editing a workbook, Renaming sheet, cell entries (numbers, labels, and formulas), spell check, find and replace, Adding and deleting rows and columns Filling series, fill with drag, data sort, Formatting worksheet, Functions and its parts, Some useful Functions in excel (SUM, AVERAGE, COUNT, MAX, MIN, IF), Cell referencing (Relative, Absolute, Mixed), What-if analysis Introduction to charts: types of charts, creation of chart from adjacent data/ nonadjacent data, printing a chart, printing worksheet.

## **UNIT IV**

Presentation Software, Uses, Presentation tips, components of slide, templates and wizards, using template, choosing an auto layout, using outlines, adding subheadings, editing text, formatting text, using master slide, adding slides, changing color scheme, changing background and shading, adding header and footer, adding clip arts and auto shapes.

Various presentation, Working in slide sorter view (deleting, duplicating, rearranging slides), adding transition and animations to slide show, inserting music or sound on a slide, Inserting action buttons or hyperlinks for a presentation, set and rehearse slide timings, viewing slide show, Printing slides.

## **UNIT V**

Database management system, An Overview of Access, Access Tables, Data Types, Access Query, Access Reports, Creating Relationships, OLE (importing & exporting data)





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3	BCA203	Data Structure	3	2		30	70	100	
4	BCA 204	Web Designing	3	1		30	70	100	
5	BCA 205	Mathematics	3	2		30	70	100	
6	BCA206	Advance C Programming Lab			6	30	70	100	
7	BCA207	Web Designing Lab			6	30	70	100	700

**BCA201**

**Advance C Programming**

### UNIT I

Structure, declaration of structure, Union, difference between structure and union, Pointers, pointers operators, pointer arithmetic, Pointers and function, Array of pointers, Pointer and Strings, Pointer to structure, Pointers within structure, Introduction of Static and Dynamic memory allocation, The process of Dynamic memory allocation, DMA functions malloc() function, Sizeof() operator, Function free(), Function realloc()

### UNIT II

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().

### UNIT III

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(), getting file name as Command line arguments.

### UNIT IV

Preprocessor, # define, defining functions like macros, # error, #include, creating header files, include user defined header files. Conditional compilation directives i.e. # if, # else, # elif and #ifdef & #undef, using defined, #line, #pragma, the #&## preprocessor Error handling in C: types of errors, handling errors, debugging tools.

### UNIT V

Graphics on your PC: Graphics and Text mode, Video Adapter, Initialize Graphics Mode and resolution, header file graphics.h. Functions used In Graphics - Drawing a Point on Screen, Drawing - lines, rectangle, circles, arcs, polygon. Functions to fill colors. Display Text in Graphics mode, outtext(), outtextxy(), justifying text.

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**BCA202****Information Technology Trends**

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**UNIT I**

Characteristics of hypermedia, the components of hypermedia, Hypermedia applications, a system less suited for hypermedia, Application area well suited for hypermedia Virtual Reality- Introduction, Brief History of virtual reality, Present uses of virtual reality.

**UNIT II**

Introduction to E-Supply Chain Management, components, E-Supply chain architecture, some examples of using ESCM

Introduction and concept of E-Customer Relationship Management (ECRM), How technology can help in this .ECRM solutions, advantages, ECRM capabilities

**UNIT III**

Introduction to Data Warehouse and Data Marts- advantages, components, Metadata, Summarized data, Structure of a data warehouse, use of data warehouse, Introduction to data mining.

Distributed Systems- Introduction, Distributing the processing and storage function, Advantage and Disadvantage of Distributed System.

**UNIT IV**

Computer Viruses, Types of Viruses, Ways to catch Computer Virus, virus detections and preventions, Worms. Security in IT- Attacks, hackers, crackers, cryptology, encryption and decryption, firewall etc.

**UNIT V**

Introduction to AI and Experts system, Decision Support System and Executive information system.

Introduction and basic concepts of modern communication and telephony technology: CDMA, WLL, GSM, VOIP, Blue-tooth, Wi-Fi, infrared.

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**BCA203****Data Structure**

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**UNIT I**

Structural programming, top-down design, abstract data type, implementation of arrays, triangular arrays, structures, character strings, Pointers dynamic memory management.

**UNIT II**

Singly linked list, implementation linked list using arrays, implementation of linked list using dynamic memory allocation circular link list, doubly linked list, polynomial manipulation using linked list, representation of sparse matrices. Stacks - their concepts and implementation, multiple stacks. Conversion of infix to postfix notation using stack, evaluation of postfix expression, recursion, how recursion- works, queues their concepts and implementation, deque, primary queues, simulation.

**UNIT III**

Trees, Binary tree - their representation and operations, tree traversals, threaded binary trees, conversion of general trees to binary trees, binary expression tree, and applications of trees. sequential searching, binary search, height balanced tree and weight balanced trees, multiway search trees, digital search, trees, hashing and collision - resolution techniques.

#### **UNIT IV**

Sorting algorithms, bubble sort, selection sort, inserted sort, quick sort, merge sort, address calculation sort and heap sort, complexity of the algorithm.

#### **UNIT V**

Graphs, terminology, representation of graphs, reachability, minimum path problem, critical events, Graph traversals, spanning trees, application of graph.

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### **BCA 204      Web Designing**

#### **UNIT I**

HTML, Browsers and their types, URL's, web sites, Domain Names, static and dynamic sites and active web pages, Files Creation, Web Server, Web Client/Browser Hyper Text Markup Language, HTML Tags, Paired Tags, Commonly used HTML Commands Titles and Footers, Paragraph Breaks, Line Breaks, Heading Styles, Drawing Lines, Text Styles, Other Text Effects, Indenting Text, Lists, Types of Lists.

#### **UNIT II**

Using the Border attribute, Using the Width and Height Attribute, Using the Align Attribute, Using the ALT Attribute, Tables - Header, Data rows, The Caption Tag, Attributes - Width and Border, cellpadding, BGCOLOR, COLSPAN, ROWSPAN, External Document References, Internal Document References, Images as Hyperlinks, Introduction to Frames, tag, <FRAME> tag, Targeting Named Frame.  
DHTML Introduction, use and its elements, Cascading Style Sheets, working with classes , using span tag external style sheet and use of DIV tags.

#### **UNIT III**

JavaScript, Advantages, JavaScript Syntax, Data Types and Literal, Type Casting, Variables, Incorporating variables in a Script, Array, Operators and Expressions, Arithmetic Operators, Logical Operators, Comparison Operators, String Operators, Assignment Operators, Conditional Expression, Ternary and Special Operators, JavaScript Programming Constructs, If - then - else, Immediate If, For Loop, Built-in Functions, User Defined functions, Declaring functions, Place of Declaration, Passing Parameters, Variable Scope, Return Values, Recursive Functions, Placing text in a Browser, Dialog Boxes - Alert dialog box, Prompt dialog box, Confirm dialog box.

#### **UNIT IV**

JavaScript Assisted Style Sheets DOM (JSSS DOM), Understanding Objects in HTML- Properties, Methods, Browser Objects - The Web Page HTML Object Hierarchy, Access to Elements of a Web Page, How a Web Page Element is Manipulated, Handling, WEB PAGE, Events Using JavaScript, Named JavaScript Event handlers.

#### **UNIT V**

The Form Object, The Form Object's Methods, Text Element, Password Element, Button Element, Submit Button Element, Reset Button Element, Checkbox Element, Radio Element, Text Area Element, Select and Option Element, Multi Choice Select Lists

**UNIT I**

Set, Relations and Functions: Set, Cartesian Products of Sets, Relations, Functions, Binary Operations, Basic Trigonometric Functions and Problems.

Quadratic Equation: Solution of Quadratic Equations, Symmetric Functions of Roots

**UNIT II**

Determinants and Matrices: Properties and Applications, Definition and Types of Matrices, Elementary Transformation of a Matrix, Inverse of a Matrix, Normal Form of a Matrix, Orthogonal Matrices.

**UNIT III**

Differential Calculus: Derivative of a Function, Various Formulae-Product and Quotient Rule of Differentiation, Logarithmic Differentiation, Limits and Continuity, Successive Differentiation, Partial Differentiation, Rolle's Theorem, Mean Value Theorem, Taylor's Theorem, Maclaurin's Series.

**UNIT IV**

Cartesian System of Rectangular Coordinates: The Number Plane, Distance Formula, Area of a Triangle, Section Formulae, Scope of a Line, Locus and Equation.

**UNIT V**

Straight Line: To find Equation of a Straight Line Parallel to an Axis: The Point Slope Form, Two Point Form, Intercept Form, Normal, Condition of Concurrency for three Straight Lines, Analytic Proof of Geometric Theorems.

Circle: Standard form of a Circle, Its General Form, Condition of Tangency.



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2	BCA302	Computer Organization and Architecture	3	2		30	70	100	
3	BCA303	Database Management System	3	2		30	70	100	
4	BCA304	Entrepreneurship development	3	2		30	70	100	
5	BCA305	Computer Graphics	3	1		30	70	100	
6	BCA306	Object Oriented Programming - C++ Lab			6	30	70	100	
7	BCA307	Computer Graphics Lab			6	30	70	100	700

### BCA301

### Object Oriented Programming - C++

#### UNIT I

Identifiers and Keywords, Constants, C++ Operators, Type Conversion, Declaration of Variables, Statements, Simple C++ Programs, iostream.h, Keyboard and screen I/O, Manipulator Functions, Predefined manipulators, Input and Output (I/O) Stream Flags, if statement, if - else statement, switch Statement, for loop, while loop, do-while loop, break statement, continue statement, goto statement.

#### UNIT II

Defining a Function, return Statement, Types of Functions, Actual and Formal Arguments, Local and Global Variables, Default Arguments, Multifunction Program, Storage Class Specifiers, Recursive Function, Preprocessors Header Files, Standard Functions. Array, Arrays and Functions, Multidimensional Arrays, Character Array. Pointer operator, Address operator, Pointer expressions, Pointer Arithmetic, Pointers and Functions, Pointers and Arrays, Pointer and one dimensional array, Pointer and multidimensional array, Pointers and Strings, Array of Pointers, Pointers to Pointers.

#### UNIT III

Classes, Declaration of Class, Member Functions, Defining the Object of a Class, Accessing a Member of Class, Array of Class Objects, Pointers and Classes, Unions and Classes, Nested Class, Constructors, Destructors, Inline Member Functions, Static Class Members, Friend Functions, Dynamic Memory Allocations, this Pointer. Single Inheritance, Types of Base Classes, Types of Derivation, Ambiguity in Single Inheritance, Array of Class Objects and Single Inheritance, Multiple Inheritance.

#### **UNIT IV**

Container Classes, Member Access Control, Function Overloading, Special features of function Overloading, Operator Overloading, Overloading assignment operator, Overloading of Binary Operators, Overloading arithmetic operators, Overloading of comparison Operators, Overloading of Unary Operators. Polymorphism, Early Binding, Polymorphism with Pointers, Virtual Functions, Late Binding, Pure Virtual Functions, Abstract Base Classes, Constructors under Inheritance, Destructors under Inheritance, Virtual Destructors, Virtual Base class.

#### **UNIT V**

Data file operations : Opening & closing of files, Stream State Member functions, reading/Writing a character from a file, Binary file operations, Classes & file operations, Array of class objects & file operations, Nested classes & file operations, Random Access File processing.

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### **BCA302**

### **Computer Organization and Architecture**

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#### **UNIT I**

Computer System Technology: Components to Applications, Computer Systems and their Parts, Generations, Processor and Memory Technologies, Peripherals I/O and Communications, Software Systems and Applications.

#### **UNIT II**

Instruction and addressing, instruction formats, types, addressing modes. Assembly Language Programs, Assembler Directives, Pseudo Instructions, Macroinstructions, Linking and Loading.

#### **UNIT III**

Memory System Design: Main Memory Concepts, Cache Memory Organization, Mass Memory Concepts, Virtual Memory and Paging.

#### **UNIT IV**

Input/Output and Interfacing, Input/Output Devices, Input/Output Programming, Interrupts.

#### **UNIT V**

Vector And Array Processing, Shared-Memory, Multiprocessing, Distributed Multi Computing.

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### **BCA 303**

### **Database Management System**

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#### **UNIT I**

Overview of database management system, Database System Vs File System, Database system concepts and architecture, data models schema and instances, data independence and data base language and interfaces, Data definitions language, DML, Overall Database Structure. ER model concepts, notation for ER diagram, mapping constraints, keys, Concepts of Super Key, candidate key, primary key, Generalization, aggregation, reduction of an ER diagrams to tables, extended ER model, relationships of higher degree.

## **UNIT II**

Relational data model concepts, integrity constraints: entity integrity, referential integrity, Keys constraints, Domain constraints, relational algebra, relational calculus, tuple and domain calculus, basic operations.

## **UNIT III**

Functional dependencies, normal forms, first, second, third normal forms, BCNF, inclusion dependencies, loss less join decompositions, normalization using FD, MVD, and JDs, alternative approaches to database design.

## **UNIT IV**

Transaction system, Testing of serializability, Serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures, log based recovery, checkpoints, deadlock handling.

## **UNIT V**

Concurrency control, locking Techniques for concurrency control, Time stamping protocols for concurrency control, validation based protocol, multiple granularity, Multi-version schemes, Recovery with concurrent transaction. Transaction Processing in Distributed system, data fragmentation. Replication and allocation techniques for distributed system, overview of concurrency control and recovery in distrusted database.

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## **BCA304      Entrepreneurship Development**

### **UNIT I**

Definition of entrepreneur managers, traits of a potential entrepreneur, charms of being and entrepreneur, entrepreneurial competencies. SWOT analysis.

### **UNIT II**

Government policies for entrepreneur's procedures and formalities for starting own business, financial support system.

### **UNIT III**

Identification and selection of business opportunities and market survey, Business crises , business plan , implementation and customer satisfaction

### **UNIT IV**

Knowledge based enterprises, scope of entrepreneur ship in present context marketing & sales promotion of modern products/ servers.

### **UNIT V**

Techno - Economic Feasibility Assessment by preparation of Preliminary and detailed Project Report.

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## **BCA 305      Computer Graphics**

### **UNIT I**

Raster scan displays, Storage tube displays, refreshing, flickering, interlacing, color monitors, display processors resolution, working principle of dot matrix, inkjet laser printers, working principles of keyboard, mouse scanner, digitizing camera, track ball ,

tablets and joysticks, graphical input techniques, positioning techniques, rubber band techniques, dragging etc.

## **UNIT II**

Scan conversion techniques, image representation, line drawing, simple DDA, Bresenham's Algorithm, Circle drawing, general method, symmetric DDA, Bresenham's Algorithm, curves, parametric function, Beizier Method, B-spline Method.

## **UNIT III**

2D & 3D Co-ordinate system, Translation, Rotation, Scaling, Reflection Inverse transformation, Composite transformation, world coordinate system, screen coordinate system, parallel and perspective projection, Representation of 3D object on 2D screen.

## **UNIT IV**

Point Clipping. Line Clipping Algorithms, Polygon Clipping algorithms, Introduction to Hidden Surface elimination, Basic illumination model, diffuse reflection, Specular reflection, Phong shading, Gourand shading ray tracing, color models like RGB, YIQ, CMY, HSV etc.

## **UNIT V**

Multimedia components, Multimedia Hardware, SCSI, IDE, MCI, Multimedia data and file formats, RTF, TIFF, MIDI, JPEG, DIB, MPEG, Multimedia Tools, Presentation tools, Authoring tools, presentation.



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1	BCA401	Java Core Programming	3	1		30	70	100	
2	BCA402	Relational Database Management System	3	1		30	70	100	
3	BCA403	System Analysis and Design	3	2		30	70	100	
4	BCA404	Principles of Management	3	2		30	70	100	
5	BCA405	Data Communication & Networking	3	2		30	70	100	
6	BCA406	Java Programming lab			6	30	70	100	
7	BCA407	RDBMS Lab			6	30	70	100	700

### BCA401

### Java Core Programming

#### UNIT I

Java History, Java Features, Simple Java Program, Java Tokens - Java character set, Keywords, Identifiers, Literals, Operators, Separators, Java Statements, Creating the program, Compiling the program, Running the program, Machine neutral, Java Virtual Machine, Command Line Arguments, Programming Style.

#### UNIT II

Constants, Variables, Data Types, Declaration of Variables, Scope of Variable, Symbolic Constants, Modifiability, Understandability, Type Casting, Getting Values of Variables, Standard Default Values, Operators, Dot operator, Arithmetic Expressions, Type Conversions in Expressions, Operator Precedence and Associativity, Mathematical Functions.

#### UNIT III

Simple if Statement, The if.....else Statement, Nesting if.....else Statements, else if Ladder, switch statement, ternary Operator. while, do, for Statement, Jumps in Loops, Labeled Loops. Arrays, One-Dimensional Arrays, Variable size arrays, Strings, String arrays, String methods, StringBuffer class, Vectors, Wrapper Classes.

#### UNIT IV

Defining a Class, Creating Objects, Accessing Class Members, Constructors, Methods Overloading, Static Members, Nesting of Methods, Inheritance: Extending a Class, Defining a subclass, Subclass constructor, Multilevel inheritance, Hierarchical

inheritance, Overriding Methods, Final Variables and Methods, Final Classes, Finalizer Methods, Abstract Methods and Classes, Visibility Control.

## **UNIT V**

Defining Interfaces, Extending Interfaces, Implementing Interfaces, Accessing Interface Variables. System Packages, Creating Packages, Accessing a Package, Using a Package, Adding a Class to a Package, Hiding Classes. Exceptions, Exception Handling , Using finally Statement, Throwing Our Own Exceptions.

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### **BCA402**

### **Relational Database Management System**

## **UNIT I**

SQL commands, Data Definition Language Commands, Data Manipulation Language Commands, The Data types a cell can hold, insertion of data into the tables, Viewing of data into the tables, Deletion operations, updating the contents of the table, modifying the structure of the table, renaming table, destroying tables, Data Constraints, Type of Data Constraint, Column Level Constraint, Table Level Constraint, Null value Concepts, UNIQUE Constraint, The PRIMARY constraint, The FOREIGN key constraint, The CHECK Constraint, Viewing the User Constraints

## **UNIT II**

Computations on Table Data, Arithmetic Operators, Logical Operators, Comparison Operators, Range Searching, Pattern Searching, ORACLE FUNCTIONS, Number Functions, Group Functions, Scalar Functions, Data Conversion Functions, Manipulating Dates in SQL , Character Functions, Joins, Equi Joins, Non Equi Joins, Self Joins, Outer Joins, SubQueries, Correlated Queries, Using Set Operators:- Union , Intersect, Minus, Views, Creating and Altering Views, Using Views, Indexed Views, Partitioned views, Definition and Advantages of Indexes, Composite Index and Unique Indexes, Accessing Data With and without Indexes, Creating Indexes and Statistics.

## **UNIT III**

PL/SQL, The Generic PL/SQL Block, The Declaration Section, The Begin Section, The End Section, The Character set, Literals, PL/SQL Data types, Variables, Constants, Logical Comparison, Conditional Control in PL/SQL, Iterative Control, Types of Cursors, Implicit Cursor, Explicit Cursor, Explicit Cursor attributes, Cursor For Loop, Parameterized Cursor.

## **UNIT IV**

Error Handling in PL/SQL, Internal Exceptions, User Defined Exceptions. Stored Procedures and Functions:- Advantages of using a Procedure or Function, Procedure Versus Functions, Creating stored Procedures and Functions, Parameters to Procedures and Functions, Deleting a Stored Procedure or a Functions.

## **UNIT V**

Packages, Components of a Package, Package Objects, Private and Public , Package state, Package Dependency, Triggers, Use of Database Triggers, Database Triggers V/s Procedures, Types of Triggers, Row Triggers, statement Triggers, Before V/S After Triggers, Deleting a Trigger.

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### **BCA403**

### **System Analysis and Design**

## **UNIT I**

The System Concept: Definition, Characteristics of Systems, Elements of a System, Open and Closed System, Formal and Informal Information Systems, Computer based Information Systems, Management Information System, Decision Support System, General Business Knowledge, and Interpersonal Communicational System.

## **UNIT II**

SDLC, Recognition of needs, Impetus for System Change, Feasibility Study, Analysis, Design, Implementation, Post implementation & Maintenance. The Role of the Systems Analyst: Historical Perspective, The War Effort, What Does it take to do System Analysis, Academic & Personal Qualifications, The Multifaceted role of the Analyst, The Analyst/User Interface, Behavioral issues.

## **UNIT III**

Strategies for Determining Information Requirement, Problem Definition & Project initiation, Background Analysis, Fact Analysis, Review of Written Documents, Onsite Observations, Interviews & Questionnaires, Fact Analysis, Performance Analysis, Efficiency Analysis, Service Analysis.

## **UNIT IV**

Information, Information gathering tools, The art of Interviewing, Arranging the Interview, Guides to a Successful Interview, Types of Interviews and Questionnaires, The Structured and Unstructured Alternatives. Structured Analysis, The Dataflow Diagram (DFD), Data Dictionary, Decision Trees and Structured English.

## **UNIT V**

Feasibility Study: System performance, Economic Feasibility, Technical Feasibility, Behavioral Feasibility, Steps in Feasibility Analysis. Input/Output and Forms Design: Input Design, CRT Screen Design, Output Design, Requirements of form Design. H/W / S/W Selection and Maintenance: The Computer Industry, S/W Industry, a Procedure for H/W / S/W Selection, Major Phases in Selection, Criteria for S/W Selection, The Used Computer, The Computer Contract.

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## **BCA404**

## **Principles of Management**

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### **UNIT I**

Definition of Management, Science or Art, Management and Administration, Development of Management Thought, Contribution of Taylor and Fayol, Functions of Management, Types of Business Organization.

### **UNIT II**

Planning, Nature & Purpose, Steps involved in Planning, Objectives, Setting Objectives, Process of Management by Objectives, Strategies, Policies & Planning Premises, Forecasting, Decision-making.

### **UNIT III**

Organizing, Nature and Purpose, Formal and informal organization, Organization Chart, Structure and Process. Departmentation by different strategies – Line and Staff authority, Benefits and Limitations, De-Centralization and Delegation of Authority, Staffing, Selection Process, Techniques, Managerial Effectiveness.

### **UNIT IV**

Directing, Scope, Human Factors, Creativity and Innovation, Harmonizing Objectives, Leadership, Types of Leadership Motivation, Hierarchy of needs Motivation theories, Motivational Techniques, Job Enrichment, Communication Process of Communication, Barriers and Breakdown, Effective Communication Electronic media in Communication.

#### **UNIT V**

Controlling, System and process of Controlling, Requirements for effective control, The Budget as Control Technique, Information Technology in Controlling, Use of computers in handling the information, Productivity, Problems and Management, Control of Overall Performance, Direct and Preventive Control, Reporting, The Global Environment, Globalization and Liberalization, International Management and Global theory of Management.

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### **BCA405**

### **Data Communication & Networking**

#### **UNIT I**

Multiplexing, Signaling, Encoding & Decoding, Error Detection & Recovery, Flow Control, Sliding Window, Congestion Management. Networking, OSI Model for Networking, Internet, ATM, Network Components (Cables, Hubs, Bridges, Switches, Routers), Network Topologies, Shared Medium, Peer to Peer, Hybrid Technology.

#### **UNIT II**

Local Area Network Technologies, Ethernet Technologies, Ethernet Versions, Token Ring Technologies, Wide Area Network Technologies (Frame Relay, SMDS, ISDN, SONET, PPP, HDLC, LLC), Wireless Networks (Radio Frequencies, Microwave Frequencies, Infrared Waves).

#### **UNIT III**

Multiple Access, Distributed & Centralized Design, Circuit Mode & Packet Mode Design, Implementation Issues, Performance Considerations, Base Technology (FDMA, TDMA, CDMA, Centralized Access, Circuit Mode Access, Poling or Packet Mode Access, Reservation Based Access), Distributed Access (decentralized polling, CSMA, CSMA/CA, CSMA/CD, Busy Tone Multiple Access & Multiple Access Collision Avoidance, Token Passing, ALOHA, Slotted ALOHA, Reservation ALOHA), Hardware Addressing.

#### **UNIT IV**

Circuit Switching (Time Division switching, Space division switching, time space switching, time space time switching), Packet Switching (Port Mappers, Blocking, ATM Switching, Switching Fabric (Crossbar, Broadcast, Switching Fabric

Elements), Bridges (Transparent bridges, Spanning Tree Algorithm, Virtual LANS), Switches.

#### **UNIT V**

Hierarchical Naming, Addressing, Telephone Networks, Internet, IPv4, IPv6 Subnetting Ipv4 Networks, Private Networks, Asynchronous Transfer Mode, Name Resolution, Address Resolution Protocol (ARP), RARP.



BCA V Semester									
S No.	Code	Subject	Teaching Scheme			Max. Marks			
			L	T	P	Internal	External	Total	
1	BCA501	Programming with VB.Net	3	1		30	70	100	
2	BCA502	Management Accounting and Economics	3	2		30	70	100	
3	BCA503	Marketing Management	3	2		30	70	100	
4	BCA504	Operating System	3	2		30	70	100	
5	BCA505	Multimedia Applications	3	1		30	70	100	
6	BCA506	Programming with VB.Net Lab			6	30	70	100	
7	BCA507	Multimedia Applications Lab			6	30	70	100	700

### BCA501

### Programming with VB.Net

#### UNIT I

Introduction to .NET Framework 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 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.NET, 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.NET, 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.

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### **BCA502      Management Accounting and Economics**

#### **UNIT I**

Double Entry Book Keeping - Data Entry in the primary and secondary books of accounts -Preparation of Trial Balance, Preparation of Final Accounts with adjustment.

#### **UNIT II**

Cost Accounting - Relationship with Financial Accounting - Elements of Cost - Introduction to management accounting. Basic cost concepts and concerns. Unit Costing.

#### **UNIT III**

Materials Cost - Materials purchasing, receiving, storing, issuing including pricing of issues, Labor Cost - Time Keeping and Time Booking - Idle Time - Labour Turnover, overheads, preparation of Cost Sheet Cost-Volume-Profit Analysis, Ratio Analysis.

#### **UNIT IV**

Definition, nature and scope of Managerial Economics - Managerial Economics and Micro-economics Demand Analysis - Determinants of Market Demand - Law of Demand -Elasticity of Demand - Measurement and its use.

#### **UNIT V**

Cost Benefit Analysis - Private vs. Public Goods, Steps in cost benefit analysis - Justification for the use of cost benefit analysis

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### **BCA503**

### **Marketing Management**

#### **UNIT I**

Marketing – Definition, Concepts Significance & functions of Marketing, Approaches to the study of Marketing, Relevance of Marketing in a developing economy. Role & functions of Marketing Manager.

#### **UNIT II**

Types of Marketing, Tele Marketing, E-Marketing-Service Marketing, Rural Marketing feature & importance suggestion for improvement of Rural Marketing, Marketing Planning & strategies.

### **UNIT III**

Meaning – Scope, Utility – Product mix, Product concept, and Product life Cycle – Product Simplifications – Decertification Elements Price mix – factors, Methods, Importance.

### **UNIT IV**

Types of Channels, Factors influencing channels, Elements of Promotion Mix – Sales Promotion System. Recent Trends in Promotion Sale. Advertising – Role of Advertising, Advertising Media, Meaning, Definition, Different ways to Segmentation, Essential of effective Market Segmentation

### **UNIT V**

Marketing Information System & Marketing Research, Concept & components of a Marketing Information System – Marketing Research, Meaning & scope, marketing research procedure, types & techniques of Marketing Research, Managements use of Marketing Research.

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## **BCA504      Operating System**

### **UNIT I**

Introduction to Operating Systems, Operating system services, multiprogramming, time-sharing system, storage structures, system calls, multiprocessor system. Basic concepts of CPU scheduling, Scheduling criteria, Scheduling algorithms, algorithm evaluation, multiple processor scheduling, real time scheduling I/O devices organization, I/O devices organization, I/O devices organization, I/O buffering.

### **UNIT II**

Process concept, process scheduling, operations on processes, threads, interposes communication, precedence graphs, critical section problem, Semaphores, classical problems of synchronization. Deadlock problem, deadlock characterization, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock, Methods for deadlock handling.

### **UNIT III**

Concepts of memory management, logical and physical address space, swapping, contiguous and non-contiguous allocation, paging, segmentation, and paging combined with segmentation.

### **UNIT IV**

Concepts of virtual memory, demand paging, page replacement algorithms, allocation of frames, thrashing, demand segmentation. Security threads protection intruders-Viruses-trusted system.

### **UNIT V**

Disk scheduling, file concepts, file access methods, allocation methods, directory systems, file protection, introduction to distributed systems and parallel processing case study.

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## **BCA505**

## **Multimedia Applications**

### UNIT I

Fundamental concepts in Text and Image: Multimedia and hypermedia, World Wide Web, overview of multimedia software tools. Graphics and image data representation graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video.

### UNIT II

Fundamental concepts in video and digital audio: Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.

### UNIT III

Action Script I: ActionScript Features, Object-Oriented ActionScript, Datatypes and Type Checking, Classes, Authoring an ActionScript Class. Action Script II: Inheritance, Authoring an ActionScript 2.0 Subclass, Interfaces, Packages, Exceptions

### UNIT IV

Application Development: An OOP Application Framework, Using Components with ActionScript MovieClip Subclasses.

### UNIT V

Basic Video Compression Techniques: Introduction to video compression, video compression based on motion compensation, search for motion vectors, MPEG, Basic Audio Compression Techniques.



BCA VI Semester							
S No.	Code	Subject	Max. Marks				
			Internal	External	Total		
1	BCA610	Seminar	50	100	150		
2	BCA611	Project/Training	50	200	250	400	

