AWADHESH PRATAP SINGH UNIVERSITY
REWA (M.P.)

SYLLABUS

BACHELOR OF COMPUTER APPLICATION

(BCA I-VI SEM)

W.E.F. SESSION 2012-13

BACHELOR OF COMPUTER APPLICATION (BCA)

CURRICULUM AT A GLANCE

Syllabus and Course Structure recommended by the Board of Studies of Computer Science dated 22/05/2012.

BCA (First Semester)

PAPER CODE	NOMENCLATURE OF PAPER	Theory Max/Min		CCE Max/Min
FC –I-1	Foundation Course –I	70	35	45/15
FC –I-2	Foundation Course –II	35		
BCA-1	Fundamentals of Computers	35/12		15/5
BCA-2	Introduction to Operating System	35/12		15/5
BCA-3	Introduction to PC Software	35/12		15/5
BCA-4	Basic Mathematics-I	35/12		15/5
BCA-5(PR)	S/W Lab 1 – OS	50/17		-
BCA-6(PR)	S/W Lab 2 - PC Software	50/17		-

BCA (Second Semester)

PAPER CODE	NOMENCLATURE OF PAPER	Theory Max/Min		CCE Max/Min
FC –II-1	Foundation Course –I	70	35	45/15
FC –II-2	Foundation Course –II	35		
BCA-7	Programming in C	35/12		15/5
BCA-8	Digital Electronics	35/12		15/5
BCA-9	Analysis & Design of Information System	35/12		15/5
BCA-10	Web Technologies	35/12		15/5
BCA-11 (PR)	S/W Lab 1 – C	50/17		-
BCA-12 (PR)	S/W Lab 2 – Web Technologies	50/17		-

BCA (Third Semester)

PAPER CODE	NOMENCLATURE OF PAPER	Theory Max/Min		CCE Max/Min
FC –I-1	Foundation Course –I	70	35	45/15
FC –I-2	Foundation Course –II	35		
BCA-13	OOPs Using C++	35/12		15/5
BCA-14	Data Structure	35/12		15/5
BCA-15	System Software	35/12		15/5
BCA-16	Information Storage Management	35/12		15/5
BCA-17(PR)	S/W Lab 1 – C++	50/17		-
BCA-18(PR)	S/W Lab 2 – Data Structure	50/17		-

BCA (Fourth Semester)

PAPER CODE	NOMENCLATURE OF PAPER	Theory Max/Min		CCE Max/Min
FC –I-1	Foundation Course –I	70	35	45/15
FC –I-2	Foundation Course –II	35		
BCA-19	DBMS	35/12		15/5
BCA-20	Visual Programming Language	35/12		15/5
BCA-21	Computer Network	35/12		15/5
BCA-22	Basic Mathematics-II	35/12		15/5
BCA-23(PR)	S/W Lab 1 – DBMS	50/17		-
BCA-24(PR)	S/W Lab 2 – Visual Prog.	50/17		-

BCA (Fifth Semester)

PAPER CODE	NOMENCLATURE OF PAPER	Theory Max/Min		CCE Max/Min
FC –I-1	Foundation Course –I	70	35	45/15
FC –I-2	Foundation Course –II	35		
BCA-25	Computer Graphics	35/12		15/5
BCA-26	Programming in Java	35/12		15/5
BCA-27	Operating System	35/12		15/5
BCA-28	Discrete Mathematics	35/12		15/5
BCA-29(PR)	S/W Lab 1 – Comp. Graphics	50/17		-
BCA-30(PR)	S/W Lab 2 – Java	50/17		-

BCA (Sixth Semester)

PAPER CODE	NOMENCLATURE OF PAPER	Theory Max/Min		CCE Max/Min
FC –I-1	Foundation Course –I	70	35	45/15
FC –I-2	Foundation Course –II	35		
BCA-31	Software Engineering	35/12		15/5
BCA-32	RDBMS	35/12		15/5
BCA-33	Real Life Project (Internal & External Evaluation)	150/50		-
BCA-34(PR)	S/W Lab 1 – RDBMS	50/17		-

GRAND TOTAL : 450 x 6 = 2700

The syllabus of Foundation Course will be same as applicable for BA/BSC course in respective semesters, approved by Central Board of Studies.

BCA-I SEM

BCA-1 : FUNDAMENTALS OF COMPUTERS

Max Marks 35 (12)

Unit-I

History, Generation of Computers, Characteristics, Capabilities and Limitations. Classification of Computers and types of Digital computers. Hardware, Software, types of software. Generations of Computer Languages, High and low level languages, Types of Translators (Compiler, Interpreter and Assembler)

Unit-II

Working of a computer using block diagram, Components of Computer system, Central Processing Unit, Address, Control and Data Bus, Arithmetic Logic Unit, Control Unit, storage units : Bits and Bytes; external & internal devices, Booting of PC system, Comparative study of various series of IBM PC Family.

Unit-III

Introduction and working of various input/output devices: Keyboard, mouse, MICR, OCR, OMR, Bar Code, Audio Response Unit, Scanner, VDU, Plotter, Impact and Non-impact printers, Computer Output Microfilm (COM).

Unit-IV

Primary memory: RAM, ROM, EPROM, EEPROM, Cache memory. Secondary memory: Floppy disc, hard disk, magnetic tape, CD-ROM, DVD. Overview of tracks, sectors, cylinders, access time, seek time, latency time.

Unit-V

Basics of data communication. Communication media, Methods of data transmission, modes of data transmission, Analog versus digital and serial versus parallel communication. Introduction to computer Network: Advantages, type, various LAN topologies, Distinction between LAN, WAN, MAN. Overview of Internet: www, email, ftp, telnet, chat, browser, newsgroup.

Books Recommended:

1. Sinha, P.K.: Computer Fundamentals, BPB Publ.
2. Jain, Satish: Introduction to Computer Science, BPB Publ.

BCA-I SEM

BCA-2 : INTRODUCTION TO OPERATING SYSTEM

Max Marks 35 (12)

Unit-I

Introduction to O.S.: Historical evolution, Need, Type. Batch processing, multiprogramming, time sharing, Online, Real time, multitasking, multiprocessing. Spooling. Functions of O.S. Layered organization, Comparative study of popular operating systems.

Unit-II

MS-DOS: Internal commands (dir, copy, del, cd, rd, md, rename, prompt, ver, vol, type, path, time, date etc.). External commands (tree, undelete, chkdsk, fdisk, backup, restore, format, unformat, attrib, xcopy, diskcopy, diskcomp etc.)

Unit-III

File redirection, filtering and piping, Concept of Batch files, config file, autoexec file. Booting process in MS-DOS, File system and concepts of files and directories in MS-DOS, Use of function keys in MS-DOS.

Unit-IV

Structure of Unix system: Kernel, Shell, Utility programs. Unix file system, concept of files and directories. General commands: bc, echo, cut, kill, date, wc, sleep, who, ps etc. File oriented commands: cat, cp, grep, pg, mv, rm, del, etc. File permissions: chmod, chown etc. Directory oriented commands: ls, mkdir, cd, rmdir, pwd etc. Inter user communication commands: write, mail etc.

Unit-V

Windows: Introduction, GUI, windows desktop, start button, taskbar, switching between programs and windows. Managing files, folders and objects. Windows explorer, Creating shortcuts. Control panel. Windows accessories: Paintbrush, wordpad, calculator, etc. Sharing information among applications using OLE and clipboard. Comparison of Unix, MS-Windows and MS-DOS.

Books Recommended:

1. Cowart, R.: Mastering windows, BPB.
2. Koparkar, P.K.: Unix for you, TMH.
3. Thomas, R.: Dos 6 and 6.2 instant reference, BPB.

BCA-I SEM

BCA-3 : INTRODUCTION TO PC SOFTWARE

Max Marks 35 (12)

UNIT–I

Introduction to Microsoft Office : The Office Manager, Sharing Information with Microsoft Office, The Clipboard, Object Linking and Embedding (OLE), Editing Linked Information, Editing Embedded Objects, Word Processing with Word for Windows: Word Basics: Undo, Redo, Repeat, Inserting Text, Replacing Text, Formatting Text, Cut, Copying from one Word Document to Another, Print, Autoformat.

UNIT–II

MS WORD : Working with Headers, Footers, Endnotes, Footnotes, tabs, tables, sorting, Working with graphics: Importing graphics, Sizing and Cropping graphics with the picture command, Drawing objects, Text in Drawings (Word Art), Pictures using Drawing objects, Rotating and Flipping Objects, Callouts, Filling: Templates, Wizards: Spelling Checker, Autocorrect, Autotext, Grammar Checker, Word Count and Other Statistics, Creating Tables of Contents and Index, Macros, Introduction to Mail Merge.

UNIT–III

MS EXCEL: Overview of Excel Features, Rearranging worksheets: Excel page setup, changing column widths and row heights, autoformat, manual formatting, using different styles, hiding rows and columns, working with multiple worksheets. An Introduction to excel functions, Excels chart features: Instant charts with the chart Wizard, creating charts on separate Worksheets, Resizing and Moving charts, adding chart notes and arrows, editing charts, Working with graphics in excel: creating and placing graphic objects, resizing graphics, Introduction to Excel's command Macros, using worksheets as databases.

UNIT–IV

MS POWERPOINT: Creating presentations, Auto content wizard, editing slides, Working with Text in Power Point, Formatting and Aligning Text; Working with graphics in Power Point; Importing images from the outside and drawing in power point, creating organizational charts, inserting cliparts & picture/photos in Power Point Presentation, Excel charts in power point, inserting table from word, Arranging, Previewing and rehearsing, transition and building effects, printing presentation elements, creating overhead transparencies.

UNIT–V

MS ACCESS : Creation of databases, tables, forms, reports & queries, use of macros & modules, creation of relationships among tables, generating simple queries using databases. Administering & securing a database, Writing expressions for queries.

Books Recommended :

1. Mansfield R.: The Compact guide to MS-OFFICE, BPB
2. Mansfield R.: Word 6 for Windows Quick & Easy Reference, TECH.
3. Murray : Mastering POWER POINT 6.0 for Windows, BPB
4. Cowart : ABC's of MS – ACCESS, BPB.

BCA-I SEM

BCA-4 : BASIC MATHEMATICS

Max Marks 35 (12)

Unit-I

Set Theory : Introduction, Basic Concepts of Set Theory, Operations on Sets, Venn Diagram, some basic set identities, Cartesian product, Relations, Domain and Range of Relations, Types of Relations.

Unit-II

Limits, function and continuity: Concept of real function, its domain and range. Fundamental theorems on limits, continuity of a function at a point, over an open, closed interval, properties of continuous function.

Unit-III

Determinants: Definition, minors and cofactors, properties. Matrices: Definition, types, equality, multiplication of matrices, transpose of matrix, adjoint of a matrix, inverse of a matrix, application of matrices in solving the simultaneous equation.

Unit-IV

Co-ordinate Geometry -I : Rectangular Cartesian coordinates of a point in space, Distance between two points, cylindrical co-ordinates; spherical co-ordinates, direction Cosines points of division, orthogonal projection, angle between straight lines.

Unit-V

Co-ordinate Geometry-II: Sphere circle & related topics, Tangent lines and Tangent Planes to a sphere, redial plane, redial line, co axial spheres. Limiting points examples and exercises.

Books recommended:

1. N. Saran : Real analysis, S. Chand and Co.
2. Shanti Narayan and P. K. Mittal Analytical Solid Geometry, S. Chand and co.
2. Parmanand Gupta : Comprehensive mathematics, Laxmi Publ. Ltd.
3. R. K. Mohanti : Differential Calculus, Anmol Pub.

BCA-II Sem

BCA-7 : PROGRAMMING IN C

Max Marks 35 (12)

UNIT–I

C language programming: Flowchart, Algorithm, Introduction to C language, Character set of C-language. The structure of a simple C program; Simple I/O functions (scanf, printf, gets, puts, getchar, getche, getch); Use of semicolon, braces, parentheses, comments and newline character; Data types in C. Assignment statement, Arithmetic, Relational & Logical operators; Unary operator, sizeof operator, Conditional operators, Precedence of operators.

UNIT–II

Control structure: The if-else statements, nesting of if-else, switch statement, Loops: while and do-while loop, the for loop, Functions: User defined functions, Returning a value from a function, Local and Global variables, Parameters, Type declaration of a function, Functions with more than one parameters, Prototype of a function. Functions with arguments, functions without arguments. Storage classes

UNIT–III

Arrays: Declaration and initialization; the break and continue statement; String and Character arrays, operations with arrays; searching in array (linear and binary). Sorting an array (Bubble, Selection and Insertion), String & String functions: sprintf, strcpy, scanf, strcat, strlen, malloc, strcmp. Two dimensional array, matrix, types of matrix – addition and product of two matrices.

UNIT–IV

Pointers: The concept of pointers, passing pointers as parameters, arrays of pointers, Pointer to pointers, Array of pointers to strings, Sorting an array, using pointers, Structures: The concept of structure, Initializing, Arrays of structures, Arrays within structures, Structures within Structures, passing structures to function, unions

UNIT–V

Files: Files in 'C', Modes for files; Functions used in files (getc, putc, fopen, fclose, fscanf, fread, fwrite, fprintf, fseek, ftell, rewind), text versus binary files, The C preprocessor, Preliminaries of C preprocessor Directives, (#define, #undef, #include, #ifdef, #ifndef, #endif, #else, #if).

Books Recommended:

1. Gottfried, Programming with C, TMH
2. E. Balagurusamy, Programming in ANSI C, TMH
3. Rajaraman, Introduction to C, PHI
4. Cooper, Mullish, The Spirit of C, An introduction to modern programming, Jaico Pub. House, N. Delhi.
5. Y. Kanetkar, Understanding Pointer in C, BPB
6. Y. Kanetkar, Let us C, BPB
7. Y. Kanetkar, Exploring in C, BPB

BCA-II SEM

BCA-8 : DIGITAL ELECTRONICS

Max Marks 35 (12)

Unit-I

Number system and codes, decimal, binary, octal, hexadecimal and their inter conversion. Binary addition, subtraction, multiplication and division ASCII, gray code, excess-3 code, BCD numbers.

Unit-II

Gates: NOT, OR, AND, NAND, NOR, XOR, XNOR. Boolean algebra, DeMorgan's theorem, Application of gates, Half adder and full adder.

Unit-III

TTL circuits: Digital IC 74 series, TTL characteristics, Totempole and open collector gates, Comparison between different types of TTL, Multiplexer, Demultiplexer, Encoder, Decoders.

Unit-IV

Boolean functions and truth tables, SOP, POS, min-terms and max-terms, Karnaugh map, method of reduction.

Unit-V

Flip-flop, registers and counter. RS flip-flop, Clocked D Flip-flip, Edge triggered D Flip-flip, Edge triggered JK Flip-flip, Racing in Flip-flop, JK Master-Slave Flip-flip. Buffer registers, Shift registers, Ripple counters, Synchronous counters, Ring counters, Presetable counters, Mod counters.

Books recommended:

1. Digital Computer Electronics: Malvino.

2. Computer Fundamentals : B. Ram.

BCA-II SEM

BCA-9 : ANALYSIS AND DESIGN OF INFORMATION SYSTEM

Max Marks 35 (12)

UNIT-I

Organizational Foundation of IS: Historical Evolution of Information system, The competitive Business Environment, Advantages of Using Computerized Information System (IS), Six major types of Information System, The changing matter of Information Technology, Challenges of Information systems, Relationship between Organisation and Information systems, Salient Features of Organization and management, Classical Model, Behavioral Model and Decision Model, Levels and types of Decision Making, System Approach Theory, Management Challenges, Ethical and Social Impact of Information System.

UNIT –II

Technical Foundation of Information System: Charting Techniques, Structured Analysis and Design, Decision Tree, Decision Table, DFD, Data Dictionary, Information System Software Tools and Approaches: Advantages and disadvantages of using IS Software Tools, Idea of Object Oriented Programming, CASE tool, PERT & CPM, Recent Database Management Trends, Distributed Databases: Object Oriented and Hypermedia Databases, Telecommunications, The Internet.

UNIT –III

Building Information System: Traditional System Development Life Cycle (SDLC), Analysis: Problem Identification, Fact Gathering, Fact Analysis, Feasibility Study, Feasibility Report, Design: Physical and Logical Design, File Design, I/O Design, Database Design, Limitation of traditional life cycle approach, Prototyping, Outsourcing information system, A Typical Case Study of Information System.

UNIT –IV

Implementation: Managing and Controlling of Information System, Testing, training, conversion, Post Implementation phase, Ensuring quality with IS, Traditional tool & methodology for quality assurance, New approaches to quality assurance, Measuring Information System Success, Areas of Problem in Information System, Causes of Information system Success and Failure, Controlling Risk Factor, Auditing Information System.

UNIT–V

Management and Organizational Support Systems: Knowledge Work System, Decision Support System (DSS), Group Decision Support System (GDSS), Executive Support System (ESS), Artificial Intelligence (AI), Expert System, Neural Network, Growth of International Information System, Main Technological Issues: Merger of International Technology and Infrastructure.

Books Recommended:

1. Lauden C. Kennieth & Lauden P. Jane: Management Information System: Organization Technique, PHI.
2. Awad E. M.: Systems Analysis and Design, Galgotia Pub.
3. Murdic, Ross, Clagett : Information Systems for Modern Management, PHI
4. Bhatnagar S. C. : Computer & Information Management, PHI

BCA-II SEM

BCA-10 : WEB TECHNOLOGIES

Max Marks 35 (12)

UNIT – I

Internet : History and evolution of Internet .Internet & intranet ,Basic concept of www , HTTP, FTP, URL, domain name, IP address, web browser, web server, web page, web site, Portals, email, chatting, Usenet, telnet, newsgroup, Fax, Telephony, telecommuting, Conferencing. Searching , downloading , uploading, files on internet ,Search Engines. Email (reading, ending, deleting, replying), voice & video conferencing. Internet Protocol :TCP/IP, dialup access, direct access, three levels of Internet connectivity. ISPs, Introduction to DNS.

UNIT-II

Internet Security & HTML: Overview of internet security, access security, transaction security, security zones, digital IDS, sending / receiving signed & encrypted emails. Introduction to firewalls. web page design : static and dynamic web pages, introduction to HTML.HTML elements and tags, formatting with HTML tags, physical, logical HTML styles ,setting fonts ,colors and headings. displaying Plain , presenting and arranging text using <DIV>, <SPAN> , <LAYERS> tags.

UNIT-III

ADVANCE HTML: Working with images, links and lists, creating tables. working with frames, creating horizontal, vertical frames, named frames, opening new browser window, creating html forms, Adding controls on forms, submitting data from forms, working with multimedia, multimedia sound, video, 3D,Using multimedia files, inline sound and videos. Style sheets: types, creating and, using style sheets.

UNIT-IV

Java script & XML: introduction to client and server side scripting, introduction to Java script, data types, operators, conditional statement, loops in Java script, functions, arrays, objects and elements in Java script, form validation using Java script. Introduction to XML, Creating XML documents, specifying attributes in DTDs, accessing XML data with XML Data Island, documents. Handling events while loading XML documents.

UNIT-V

E-Commerce: Introduction to E-Business, Electronic Fund Transfer (EFT), Value-chain, internet Business strategy, Functional Architecture, implementation Strategies; Building Blocks of E-commerce, System design, creating and managing content etc; Payment systems; Auxiliary system; transaction Processing; Building e-commerce system, system architecture, secure links etc; Present and future Trend; Impact of e-commerce; A case Study on development of e-commerce system.

Books Recommended:

1. Teach Your Self Internet In 24 Hours : Techmedia.
2. Internet Complete : BPB Publication.
3. HTML Blake Book: Steven Holzer.
4. The Internet :Christian Crumlish (BPB Publication).
5. Html Complete : BPB Publication.

BCA-III SEM

BCA-13 : OOPs USING C++

Max Marks 35 (12)

Unit-I

Introduction to OOP :- Procedural, Structured and Object Oriented Programming(OOP) , Basic concepts of OOP : Object, Classes, Inheritence, Polymorphism, Reusability; Benefits & applications of OOP, C^{++} and OOP. Characters used in C++. Basic data types, user defined data types, Structure of C^{++} program, use of conditional and looping statements in C++. Arrays in C++. Reference variable, operators, structures, union, enum.

Unit-II

Functions : prototypes, default arguments, const arguments in functions, Inline functions, call by value, call by reference, function overloading. Classes and objects : Declaring a class, defining an object, data hiding and encapsulation, public and private data members & functions, friend function. Pointer to data member, pointer to member function and pointer to object, virtual function.

Unit-III

Constructors & Destructors: Parametrized constructors, multiple constructor in a class, copy constructors, arrays of object, object as function, arguments, returning objects, the this pointer, memory allocation for objects. Operator Overloading : Unary and binary operators, type conversions.

Unit-IV

Inheritence : Inheritence and derivation, single, multilevel, multiple, hierarchical & hybrid inheritence, constructors in multiple inheritence, private and protected inheritance. Overriding functions, virtual methods, ambiguity resolution, virtual base class. Constructors in derived class. Member classes : nesting of classes.

Unit-V

Streams : C^{++} streams, stream classes, unformatted & formatted I/O operations, member functions of cin, manipulators, managing output with manipulators, user defined manipulators with arguments. Files : Classes for file stream operations, file I/O with streams, file modes, binary versus text files, binary I/O, random access, error handling during file operations, command line arguments, Exception handling.

Books Recommended:

1. E. Balagurusamy, Object Oriented Programming with C^{++} , TMH
2. Jesse Liberty, Teach Your self ANSI C^{++} , Techmedia
3. Robert Lafore, Object Oriented Programming in Turbo C^{++} , Galgotia Publications
4. Stroustrup, The C^{++} Programming Language, Addison Wesley.
5. Herbert Schild, C^{++} Complete Reference, TMH
6. Yashwant Kanatkar, Let us C^{++}, BPB

BCA-III SEM

BCA-14 : DATA STRUCTURE

Max Marks 35 (12)

UNIT - I

Primitive Data Structures, Operations on Data Structures; Integer, Real number, Character Information, Logical and Pointer Information, Algorithm analysis for time and space requirements. Non-primitive data structures, Storage structure for arrays, Operations on arrays, Sparce matrices. Stacks: Definition and operations on stacks, Applications of stacks; Recursion, Polish expressions and their manipulations.

UNIT–II

Queues: Operations on queues, Priority queues; Linked storage representation, Pointers and linked allocation, Linked linear lists, Operations on linked lists, Circular linked list, Doubly linked lists, Application of linked lists. Dynamic Storage Management: Garbage collection, Compaction.

UNIT–III

Trees, Definitions and concepts of general trees and binary trees, Representation of binary trees, Binary tree representation of general tree, Binary tree traversal, Threaded binary trees, Operation on binary trees, Application of trees, Binary search trees

UNIT-IV

Introduction to Graphs, definition, terminology, directed, undirected and weighted graphs. Representation of graphs. Graph traversal: Breadth first search, Depth first search. Spanning trees, Minimal spanning tree. Application of graphs.

UNIT–V

Notation and concepts, Selection sort, Bubble sort, Merge sort, Heap sort, insertion sort, quick sort. Hash-table method, Hashing functions, Collision resolution techniques, Searching : Linear search, Binary search.

Books Recommended:

1. Horowitz & Sahni : Fundamentals of Data Structures, Comp. Sc. Press
2. S. Lipschutz : Schaum's Outline Series; Data Structures, Mc Graw Hill
4. Data Structures Using C; Tenenbaum, PHI
5. Data Structures Using Pascal, Tenenbaum, PHI
6. D. E. Knuth : The Art of Computer Programming, Addision Wesley
7. R. G. Dromey : How to solve it by computer

BCA-III SEM

BCA-15 : SYSTEM SOFTWARE

Max Marks 35 (12)

UNIT–I

Difference between system software and application software. Layered organization of system software. Introduction to System Software: The Simplified Instructional Computer (SIC): Machine structure (Memory, Register, Data formats, Instruction format, Addressing modes, Instruction set, Input/output) Assemblers: Basic Assembler Functions (A Simple SIC assembler, tables and logic).

UNIT – II

Assemblers: Basic Assembler Functions (A Simple SIC assembler, tables and logic), Assembler for Small Computer, op-code and symbol table.

UNIT-III

Loaders And Linkers: Separate Compilation and linking, loading, linking & relocation, Basic Loader Functions, Machine dependent loader features (Relocation, Program linking, Tables and logic, a linking loader), Machine-independent loader features (Automatic library search, loader upturns, overlay program), Loader Design option (Linkage editors, Dynamic linking, Bootstrap loaders)

UNIT-IV

Software Tools : A brief overview, interpreter and program generators, debug monitors, programming environments. Text editors: Overview of the editing process, User interface editor structure.

UNIT-V

Compilers: Main parts of a Compiler , Basic Compiler Functions, Lexical analyzer, parser, symbol table manager, Code generator.

Books Recommended:

1 Leland L. Beck: System Software (An introduction to systems programming), Addison Wesley Publishing Company.

2. Alfred Jeffrey Ullman: Principles of Compiler Design, Narosa Publishing Home, New Delhi.

3. D.M. Dhamdhare: Systems Programming & Operating Systems, TMH

BCA-III SEM

BCA-16 : INFORMATION STORAGE MANAGEMENT

Max Marks 35 (12)

Unit-I

Introduction to Storage Technology: Data proliferation, evolution of various storage Technologies, Overview of storage infrastructure components, Information Lifecycle Management, Data categorization.

Unit-II

Storage Systems Architecture: Intelligent disk subsystems overview, Contrast of integrated vs. modular arrays, Component architecture of intelligent disk subsystems, Disk physical structure components, properties, performance, and specifications, RAID levels, hot sparing.

Unit-III

Introduction to Networked Storage: JBOD, DAS, NAS, SAN & CAS evolution and comparison. Applications, Elements, connectivity, standards, management, security and limitations of DAS, NAS, CAS & SAN.

Unit-IV

Hybrid Storage solutions; Virtualization: Memory, network, server, storage & appliances. Data center concepts & requirements, Backup & Disaster Recovery: Principles Managing & monitoring : Industry management standards (SNMP, SMI-S, CIM).

Unit-V

Information storage on cloud :Concept of Cloud, Cloud Computing, storage on Cloud, Cloud Vocabulary, Architectural Framework, Cloud benefits, Cloud computing Evolution, applications & services on cloud, Cloud service providers and Models, Essential characteristics of cloud computing, Cloud Security and integration.

Books Recommended:

1. G. Somasundaram & Alok Shrivastava (EMC Education Services) editors; Information Storage and Management: Storing, Managing, and Protecting Digital Information; Wiley India.
2. Ulf Troppens, Wolfgang Mueller-Friedt, Rainer Erkens, Rainer Wolafka, Nils Haustein; Storage Network explained : Basic and application of fiber channels, SAN, NAS, iSESI, INFINIBAND and FCOE, Wiley India.
3. John W. Rittinghouse and James F. Ransome; Cloud Computing : Implementation , Management and Security, CRC Press, Taylor Frances Pub.
4. Nick Antonopoulos, Lee Gillam; Cloud Computing : Principles, System & Application, Springer.
5. Anthony T. Velete, Toby J.Velk, and Robert Eltenpeter, Cloud Computing : A practical Approach, TMH Pub.
6. Saurabh , Cloud Computing : Insight into New Era Infrastructure, Wiley India.
7. Sosinsky, Cloud Computing Bible, Wiley India.

BCA-IV SEM

BCA-19 : DATABASE MANAGEMENT SYSTEM

Max Marks 35 (12)

UNIT-I

Basic Concept: An Introduction to database System, Advantages and limitations of DBMS. Database System Architecture, Purpose of DBMS, Data Independency, Basic File Systems: Types of file, operations on file, file activity ratio, access time, response time, volatility, file size. File Organization: Sequential, Index Sequential, Direct access. Detail design of E-R Model.

UNIT-II

Three Data Models: An Overview of three Main Data Models i.e. Hierarchical Model, Network Model, Relational Model and their Inter-comparison. Relational Algebra: Basic Operation like Union, Intersection, Difference, Product, Join. The Power of SQL (Creation, Insertion, Deletion, Indexing & Modification of Databases in SQL).

UNIT-III

Normalisation: Relational Database Design: Integrity Constraints, Functional Dependency: Single Value and Multi Value Functional dependence, Normal Forms: I, II, III, Boyce Codd, IV & V Normal forms. Security & Integrity: Introduction, Access Control, Crypto Systems.

UNIT-IV

Introduction to Database and foxpro package: Ideas of database hierarchy (bit, byte, field, record); Foxpro commands: create, use, list, display, edit, browse, append, insert, delete, zap, pack, copy, to print, quit, clear, go top, go bottom, modify structure, recall, replace, sort, index, locate, continue, seek, search, find, close, Arithmetic, date, time and string function with database using commands/functions such as count, aveage, sum, time, day, dow, cdow, year, date, ctod, dtoc, cmonth, month, val, trim, str), displaying information with ? and ??.

UNIT-V

Programming: Using Input, Output statements and Conditional statement ACCEPT, INPUT, IF-ELSE-ENDIF, DO CASE-ENDCASE, DO WHILE-ENDDO, TEXT-ENDTEXT, SKIP, WAIT, STORE, SET commands, Generation of Report, Label and Customized Screen, Use of multiple files: Master file updation, Setting relations.

Books recommended:

1. Henry F. Korth & A. Silbershatz: Data Base System Concepts, MGH
2. C. J. Date: Database Management System, MGH
3. R. K. Taxali: Foxpro 2.6, TMH.
4. Arun K. Majumdar & P. Bhattacharya: Data Base Management System, TMH
5. Jeffrey O. Ullman : Principles of Database Systems, Galgotia Pub. Co. Ltd.
6. Bipin C. Desai: An Introduction to Database Systems, Galgotia Pub. Co. Ltd.
7 James Martin: Principles of Database Management, PHI
8. James Martin, Computer Database organization, PHI

BCA IV SEM

BCA-20 : VISUAL PROGRAMMING LANGUAGE

Max Marks 35 (12)

UNIT I

Introduction to VB: The Integrated Development environment (Menu bar, Tool box, Project Explorer, Properties window, object browser), working with forms, variables, procedure (Sub, Event, General). Control Structures (If…..Then…..Else), Select…..Case, Do While……Loop, For…..Next) Exit for and Exit Do statement, With-End with statement, Arrays, Data types, User-Defined, Data Types, constants, Datatype conversion, Built-in Functions, operators.

UNIT II

Working with controls – Classification of controls, study of various controls, Text box, label, Command button, option button, list box, combobox & Scrollbar, Flex grid & Built-In Activex controls) with respect to property, event and methods. Creating Control Array (at Design-time, at runtime, menus, mouse events and dialog boxes, OLE.

UNIT III

OOPS inVB: Objects, working with objects, forms as object, constructors and destructors collections (collection object, control collection), Class module. Database Programming: ODBC, Database Access methods in VB (DAO, RDO, ADO). Recordset

UNIT IV

Advanced data controls (datalist, datacombo, datagrid, Hierarchical flexigrid), SQL and the T-SGL Debugger. Overview of Data Report and Crystal Report. Activex Controls: Creating and Deploying Activex controls, Overview of COM/DCOM, Activex Exe and Activex DLL. VB Script: VB vx Vbscript, objects, operators, functions, statements in VB scripts.

UNIT V

Active Server Pages: Built in ASP objects: Response object (write, buffer, clear, flush, End, redirect, Expires, Expire Absolute method). Request object: Form collection (Query string, form), HTTP headers, ready the HTTP headers request. Server variables method, Environment variable; Cookies: Reading and writing cookies, Tradeoffs of cookies, Session object: Session variable, application object: Application variable, Session vs Application object, Global as a file ASP components: Add Rotator, Content linker and browser capabilities, Server object: Reading and writing files on the web server. Asp error object.

Text Books

1 Teach yourself VB6 in 21 days - Techmedia
2 VB6 Unleashed - Techmedia
3 Teach yourself ASP in 21 days - Techmed
4 ASP unleased - Techmedia

BCA-IV SEM

BCA-21 : COMPUTER NETWORKS

Max Marks 35 (12)

UNIT I

Introduction to Computer Networks:
Basics of data communication, digital vs analog transmission, mode of transmission, Computer Networks: Goals and kinds (LAN/WAN), idea of hardware and software requirements for computer networks, intercomparison of various communication media, wireless transmission., various topologies: bus, ring, tree & mesh, OSI reference model vs TCP/IP.

UNIT II

Data Link Layer:
Reference models: OSI vs TCP/IP, Data Link Layer Design Issues: Framing Error Control and Flow Control, Error Detection & Correction, Elementary Data Link Protocols, Sliding Windows Protocols, HDLC frame packet.

UNIT III

Medium Access Sub Layer:
Medium Access Sublayer: Channel allocation problem, Multiple access protocols: ALOHA, CSMA, Collision tree; Standards in LAN/WAN (CCITT & IEEE), High speed LANs: FDDI, Fast Ethernet; Satellite Networks: Polling, FDM, TDM, CDMA.

UNIT IV

The Network and Transport Layer:
Network Layer design issues, routing and switching techniques, Routing Algorithms, congestion control algorithms, the network layer in the internet; transport layer: Elements of transport services, transport protocols, the internet transport protocol, TCP & UDP.

UNIT V

Application Layers and Network Management:
Network Security: Traditional cryptography, cryptography principles, secret key algorithms, public key algorithm, Authentication protocol, Domain Name System, Simple Network Management Protocol, E-mail, News group, WWW, Future trends in computer networks.

Books recommended:

1 Tanenbaum: Computer Networks, PHI
2 John Freer: Computer Communication & Networks, EWP
3 William Stalling: Data & Computer Communication, PHI
4. Basandra & Jaiswal: Local Area Network, Galgotia
5. James Martin: Computer Networks & Distributed processing , PHI
6. Uyless Black: Computer Networks, PHI

BCA-IV SEM

BCA-22 : BASIC MATHEMATICS-II

Max Marks 35 (12)

UNIT I

Vector algebra and geometry: Concept of vector, forms of vector, algebra of vector. Composition and resolution of vector. Scalar and vector product of two vectors.

Unit-II

Measures of central tendency: The arithmetic mean, weighted arithmetic mean, geometric mean, harmonic mean, root mean square, median, mode, quartiles, deciles and percentiles.

Unit-III

Measures of dispersion: The range, mean deviation and standard deviation.

Unit-IV

Probability: Elementary probability theory, sample space, events, classical and relative frequency definition of probability, theorems of total and compound probability

Unit-V

Curve fitting and the method of least squares, regression, coefficient of correlation.

Books recommended:

1. M. Ray and H.S. Sharma : Mathematical statistics, Ram Prasad and Sons.
2. Parmanand Gupta : Comprehensive mathematics, Laxmi Publ. Ltd.
3. Shanti Narayan : A text book of vector algebra, S. Chand & Co.
4. M. Ray : Vector Algebra, Ram Prasad and Sons.
5. N. Saran & S.N. Nigam : Introduction to vector analysis, Pothishala Pvt.

BCA-V SEM

BCA-25 : COMPUTER GRAPHICS

Max Marks 35 (12)

UNIT-I

Introduction : Applications of Computer Graphics, Raster Graphics, Fundamentals; Scan conversion, Pixel, frame, buffer, Graphics Primitives : Line, Circle, Ellipse, character generation, polygon : representation, polygon filling algorithms, antialiasing

UNIT-II

Devices: Display Devices, random scan and raster scan monitors, color CRT monitor, direct view storage tube, Plasma Panel, Hardcopy devices : printers and plotters, Input Devices : Joysticks, mouse, digitizer, scanner, camera, Transformations : Translation, scaling, rotation, Shear, Reflection, homogeneous coordinates, composite transformation, concatenation properties, Raster method of transformation.

UNIT-III

Windowing and Clipping : Window, viewport, line clipping, polygon clipping, text clipping, Window & Viewport transformation, Display file concepts & Segmentation : display File, segment table, segment creation, deletion, rename, segment display file.

UNIT-IV

Interaction : Locator & Selector devices, interactive picture construction techniques, Three Dimensions : 3D geometry, 3D display techniques, transformation, viewing parameters.

UNIT – V

Hidden surface removal : Back face removal algorithm, Z buffers algorithm, Scan line algorithm, painter's algorithm,

Shading & Color Models : Diffuse illumination, point source illumination, specular reflection, refraction, shadows, colour, colour models, dithering, halftoning

Curves & Surfaces : Interpolation algorithm for curve fitting, B splines, bezier curves, fractals.

Books Recommended:

1. D. Hearn and Baker : Computer Graphics, Prentice Hall of India Pvt. Ltd.
2. Steven Harrington : Computer Graphics, MGH.
3. Newman and R.F. Sprouli : Principles on Interactive Computer Graphics, MGH.
4. W.K. Giloi : Interactive Computer Graphics, PHI.
5. R.A. Piastock and G. Kalley : Theory and Problems of Computer Graphics, MGH

BCA-V SEM

BCA-26 : PROGRAMMING IN JAVA

Max Marks 35 (12)

UNIT I

Introduction to Object Oriented Programming: Basic concepts, benefits of OOPS, Application of OOP, Java evolution : history, features, C, C++ & Java a comparison, Java and WWW, HW, & SW requirements for Java, Structure of simple Java program, Java tokens, statements, Java virtual machine, command line arguments, programming style, constants & variables, symbolic constants, type casting; Various operators in Java (arithmetic, relational, logical , assignment, increment, decrement, conditional, bitwise & special operator); arithmetic expressions & their evaluation, precedence of arithmetic operators, type conversions in expressions, operator precedence and associativity, mathematical functions.

UNIT II

Decision making and branching; Decision making with if statement, simple if statement, the if....else statement, nesting of if.....else statements, the else if Ladder, the switch statement, The ? operators, the while statement, the do statement, the do statement, the for statement, jump in loops, labeled loops, classes, objects and methods; Defining a class, objects and methods; Defining a class, adding variables and methods, creating objects, accessing class members, constructors, method 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, strings and vectors; Arrays, one dimensional arrays, creating an array, two dimensional arrays, strings, vectors, wrapper classes, defining interfaces, multiple inheritance, extending interfaces, implementing interfaces, accessing interface variable, Packages: Java API packages, using system packages, naming conventions, creating packages, accessing a package, using a package, adding a class to a package.

UNIT IV

Multithreaded programming; creating threads, extending the thread 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

Applet programming; Local and remote applets, preparing to write applets, building applets code, applet life cycle, creating and executing applet, designing a web page, adding applet to HTML file, running the applet, passing parameters to applets, displaying numerical values, getting input from the user.

Book Recommended:

1. Programming with Java a primer by E. Balagurusamy.
2. Peter Norton's Guide to Java Programming, Techmedia Pub.
3. Mastering in Java, Techmedia Pub.schatz & Galvin
4. Core JAVA 2 Volume_I Fundamentals Sun Microsystems

BCA-V SEM

BCA-27 : OPERATING SYSTEM

Max Marks 35 (12)

UNIT–I

Fundamental Concepts of Operating Systems: Evolution of operating systems - Serial processing, Batch Processing, Multi -programming, Types of Operating systems - Batch operating system, Time-sharing operating systems, Real-time operating system, multitasking operating system, distributed operating system. Overview of Process Management, Memory Management, File Management, Device Management, Operating system services,

UNIT-II

Process Management : Process concept, process scheduling, operation on processes, threads, enterprises communication, basic concepts, scheduling criteria, scheduling algorithms, Multiple processor scheduling, real-time scheduling, algorithm evaluation.

UNIT-III

Inter Process Synchronization: Concurrent processes, the critical section problem, the Critical Region and Conditional Critical Region problem, Inter process synchronization, Inter process communication, Deadlock occurrence, Deadlock characterization, Deadlock prevention, Deadlock avoidance, Deadlock detection and recovery.

UNIT-IV

Memory Management: Single Process Monitor, Static Partitioned memory allocation, Swapping, Relocation. Dynamic Partitioned memory allocation, Compaction. Multiple fence register. Segmentation - Address translation, Descriptor caching. Paging, Page allocation. Virtual memory, Instruction interruptability, Management of virtual memory, Page replacement, Replacement algorithms. Comparison of various memory management techniques with reference to Protection and sharability.

UNIT-V

File and Device Management: File system organization, File operations, Access methods, Directory structure organization, File protection - Goals of protection, Access matrix model of protection, Dynamic Protection Structure, Security encryption, Device management: Dedicated, Shared and Virtual devices, Sequential Access and Direct Access devices, Channel and Control Units, I/O buffering, I/O schedulers, Spooling system.

Books Recommended:

1. Peterson & Siberschatz : Operating system concepts, Sybex.
2. Senart E. Madnik and J.J. Donovan : Operating Systems, McGraw Hill.
3. Milan Melankovic : Operating Systems, Concept and Design, McGraw Hill
4. Lister Andrew : Fundamentals of Operating Systems, Macmilan Pub. Co.
5. Delteri : An Introduction to Operating System, Addition Wesley.

BCA-V SEM

BCA-28 : DISCRETE MATHEMATICS

Max Marks 35 (12)

UNIT – I

Mathematical Logic: Propositions and logical operators, Truth tables, equivalence and implementation, Laws of logic, Quantifiers. Set theory: Introduction, concept of set of theory relation, types of relation, equivalence relation.

UNIT – II

Boolean Algebra and its properties, Algebra of propositions & examples, De-Morgan's Laws, Partial order relations, greatest lower bound, least upper bound, Algebra of electric circuits & its applications. Design of simple automatic control system

UNIT – III

Graph: Simple and multigraph. Incidence and degree, Paths, walk, cycles and circuit. Isomorphism, subgraphs. Connectedness, algorithm, complete and regular graphs. Operations on graphs, Euler graph, bipartite graphs. Shortest path algorithms; travelling salesman problem, Hamiltonal paths.

UNIT – IV

Trees: Properties of trees, pendant vertices. Centre of a tree, rooted and binary trees, spanning trees - spanning tree algorithms, fundamental . circuits; spanning trees of a weighted graph: cutsets and cut-vertices; fundamental cutsets; connectivity and seperativity; network. flows; max-flow min-cut theorem.

UNIT – V

Plan on graphs, dual graphs, Kuratowski's two graph, matrix representation of graphs, incidence matrix, directed graphs, digraphs, directed paths and connectedness. Eular digraphs.

Books Recommended:

1. Harry, F.: Graph theory, Addison Wesley Publ. Co.
2. Trembley J. P. & Manohar R: Discrete Mathematical Structures with Application to Computer Science, TMH.
3. S. Lipchutz: "Finite Mathematics", Schaum Series, MGH.
4. Liu, C.L Elements of Discrete Mathematics, MGH.
5. Deo. N, Graph Theory, PHI

BCA-VI SEM

BCA-31 : SOFTWARE ENGINEERING

Max Marks 35 (12)

UNIT–I

Introduction: The product and the process, program vs software products, Emergence of software engineering, software development life cycle models, classical waterfall, iterative waterfall, prototyping, evolution, spiral & RAP model, comparison of various life cycle models, project management process, process management process.

UNIT- II

Software Requirement Analysis & Specification (SRAS) : Need for software requirement specification, requirement process, requirement analysis, requirement specification, planning a software project; cost estimation, project scheduling, staffing & personnel planning, software configuration management, plans: quality assurance plan, risk management.

UNIT-III

Software Design : Criteria for Software design, software design & design principle; module level concepts: Coupling and Cohesion, design notation & specifications, design methodology, verification, object oriented design: Basic concepts, design methodology & Metrics, object oriented vs function oriented design, detailed design.

UNIT-IV

Coding and Testing : Standard guideline for coding, programming practice, testing fundamentals, unit testing, verification vs validation, black box & white box testing, functional testing, structural testing, object oriented program testing.

UNIT-V

Software reliability & quality assurance: Reliability metrics, growth and modeling, software quality management system, evolution, ISO 9000. CASE: scope and benefit, support in software life cycle, CASE tools, hardware and environmental requirements, architecture of a CASE environment. Software maintenance.

Books Recommended:

1. Pankaj Jalote: An Integral Approach to Software Engineering, Narosa
2. Rogers Pressman: Software Engineering, a practitioner's approach, MGH
3. Rajib Mall: Fundamental of Software Engineering, PHI
4. Richard Farley: Software Engineering Concept, TMH

BCA-VI SEM

BCA-32 : RDBMS

Max Marks 35 (12)

UNIT-I

Interactive SQL: involving SQL plus, data manipulation in DBMS, the oracle data types, creating a table, creating a table from a table, insertion of data into tables, updating the contents of a table, deletion operations, the select command, many faces of the select command, modifying the structure of tables, removing/deleting/dropping tables

UNIT-II

Data constraints: column level and table level constrains, NULL value concepts primary key concepts, unique key concepts, default value concepts, the foreign - key references constraints, CHECK integrity constraints, defining different constraints on the table, defining integrity constraints in the ALTER TABLE command, dropping integrity constraints in the alter table command, computations in expression lists used to select data, logical operators, range searching, pattern matching, oracle functions, grouping data from tables in SQL, manipulating data in SQL.

UNIT-III

Joins: joining multiple tables (equi joins), joining a table to itself (self joins): sub queries, using the union, intersect and minus clause, indexes, views: creation of views, renaming the column of a view, using view, selecting a data set from a view, updatable views, destroying a view, granting permissions: permission on the objects created by the user, granting permissions using GRANT statement, object privileges, with grant option, referencing a table belonging to another user, granting permissions to another user, revoking the permissions given.

UNIT-IV

PL/SQL: introduction, performance, performance improvement, portability, PL/SQL data types, what PL/SQL can do for programming, the PL/SQL execution environment, the PL/SQL syntax, the character set, understanding the PL/SQL block structure, oracle transactions, locks, cursors, error handling in PL/SQL, stored procedures: what are procedures, where do procedures reside, how oracle create a procedure, how oracle executes procedures, advantages of procedures, syntax for creating stored procedure, an application using a procedure, deleting a stored procedure.

UNIT-V

Stored functions: what are functions, where do functions reside, how oracle crates a function, how oracle executes a function, advantages o functions, syntax for creating a stored function, an application using a function, deleting a stored function. database triggers: introduction, use of database triggers, how to apply database triggers

BOOKS RECOMMENDED:

1. Ivan Bayross: Oracle Developer 2000 BPB Pub.
2. Liebschuty: The oracle cook book, BPB Pub.
3. Michael Abbey & Michael J. Corey : Oracle Beginners guide TMH.