BACHELOR OF COMPUTER APPLICATIONS

REGULATIONS, CURRICULUM & SYLLABI

(Effect from the Academic Year 2009-10)

PONDICHERRY UNIVERSITY
KALAPET
PONDICHERRY – 605 014.
PONDICHERRY UNIVERSITY

PONDICHERRY UNIVERSITY

Bachelor of Computer Applications (BCA)

REGULATIONS

(Effective from the academic year 2009 – 2010)

Aim of the Course

The Degree of Bachelor of Computer Applications aims to introduce the students to the computer and its applications. At the end of the course, the students are expected to have good working knowledge in database and Internet applications.

Eligibility for Admission

Candidates for admission to B.C.A. shall be required to have passed Higher Secondary Examination conducted by the Government of Tamil Nadu with Mathematics / Business Mathematics / Computer Science as one of the subjects of study or an examination accepted as equivalent thereto, subject to such conditions as may be prescribed therefore.

Lateral Entry

Candidates who have passed Diploma in Computer Science / Information Technology/ Computer Technology / Computer Application in I Class (10+3 years of study) are eligible to apply for the lateral entry to the 2nd year of the course subject to availability of seats, but limited to 10% of the sanctioned intake.

Duration of the Course

The course shall be of three years duration spread over six semesters. The Maximum duration to complete the course shall be 5 years.

Medium

The medium of instruction shall be English.

Passing Minimum

Passing Eligibility & Classification for the award of the Degree as existing for the other B.Sc. Degree Courses.

PONDICHERRY UNIVERSITY

Bachelor of Computer Applications (BCA)

STRUCTURE OF THE COURSE 2009-2010

First Semester

Paper	Lecture hours/week	Practical hours/week	Duration of Exam(Hrs)	Max Mark
1. English – I	5		3	100
2. Major Paper I – Fundamentals of Computer Science	5		3	100
3. Major Paper II- Information Technology	5		3	100
4. Major Paper III- Programming Concepts and C	4		3	100
5.Allied Paper I-Mathematics for Computer Science	5		3	100
Practical I – Office Automation Lab		3	3	100
Practical II – C Lab		3	3	100

Second Semester

Paper	Lecture hours/week	Practical hours/week	Duration of Exam(Hrs)	Max Mark
1.English – II	5		3	100
2.Major Paper IV- Object Oriented Programming	4		3	100
3.Major Paper V-Fundamentals of Data Structures	5		3	100
4.Allied Paper II-Probability and Statistics	5		3	100
5.Allied Paper III-Fundamentals of Accountancy	5		3	100
Practical III – OOP (C++) Lab		3	3	100
Practical IV – Data Structures Lab		3	3	100

Third Semester

Paper	Lecture hours/week	Practical hours/week	Duration of Exam(Hrs)	Max Mark
1. Major Paper VI- Computer Organisation	5		3	100
2.Major Paper VII- Java Programming	4		3	100
3.Major Paper VIII- Fundamentals of Algorithms	5		3	100
4. Allied Paper IV-Financial Management	5		3	100
5.Allied Paper V-Operation Research	5		3	100
Practical V – Java programming Lab		3	3	100
Practical VI – Financial & Statistical packages Lab		3	3	100

Fourth Semester

Paper	Lecture hours/week	Practical hours/week	Duration of Exam(Hrs)	Max Mark
1..Major Paper IX- Operating Systems	5		3	100
2.Major Paper X-Data Communication and Networks	5		3	100
3.Major Paper XI- Visual Programming	4		3	100
4.Major Paper XII- Database Management Systems	5		3	100
5.Allied Paper VI- Principles of Management	5		3	100
Practical VII – Visual Programming and RDBMS Lab		3	3	100
Practical VIII – Networks Lab		3	3	100

Fifth Semester

Paper	Lecture hours/week	Practical hours/week	Duration of Exam(Hrs)	Max Mark
1. Major Paper XIII- Software Engineering	5		3	100
2. Major Paper XIV- .Net Framework	4		3	100
3. Major Paper XV- E-Commerce	5		3	100
4. Major Paper XVI- Web Technology	5		3	100
5. Elective I	5		3	100
Practical IX – .Net Framework Lab		3	3	100
Practical X – Web Technology Lab		3	3	100

Sixth Semester

Paper	Lecture hours/week	Practical hours/week	Duration of Exam(Hrs)	Max Mark
1.Major Paper XVII- Multimedia Applications	5		3	100
2.Elective II	5		3	100
3. Elective III	5		3	100
4. Practical XI – Multimedia Applications Lab		3	3	100
5. Project Work	-	12	Viva-Voce	100*

* Internal Assessment : 50 marks & Project Report and Viva-Voce: 50 marks

List of Electives
1. Introduction to Web User Interface Design
2. IT Project Management
3. Communication Skills
4. Client-Server Technology
5. Web Services
6. Bio Informatics
7. Mobile Communication
8. Network Security
9. Data Warehousing and Mining
10. Software Testing
11. Introduction to Intelligent systems
12. Distributed Database Management system

BACHELOR OF COMPUTER APPLICATIONS (BCA)

FIRST SEMESTER

ENGLISH I

A. The Basic -Applied Grammar and Usage

Unit I

Rules of the Language:
Parts of Speech: Nouns and Pronouns -Correct usage; Adjectives and Degrees of 'Comparison; Verbs -kinds; Tenses; Tense forms; Adverbs; Agreement of the subject with the verb; Phrasal verbs, voice change; Auxiliaries; prepositions -common errors; conjunctions - their correct uses, Clauses -kinds -usage; Articles -determiners, question, tags; Direct and Indirect speech, correction of sentence; Punctuation.

Unit II

Vocabulary Building:
Idioms -different kinds. Phrases, Fixed Expressions, common foreign words and expressions (e.g. adhoc) -Word for formation - different processes; spelling; one-word substitutes; word often confused and misused.

B. Spoken English

Unit III

Pronunciation Drills (Identifying problem areas), vowels consonants, IPA, Phonetic Notations -how to look up a word Dictionary for correct pronunciation.

Unit IV

Conversational English (both theory and practical) stress, Tonal Variations, their importance; what is an interview? How to face an interview?; How to participate in a debate?; What is a Meeting? -
Procedures -How to convene?; Discussion -How to participate.

C. Process of writing

Unit V

Sentence Patterns and Paragraph writing. Logical writing - topical sentences - arrangement of facts -supporting materials.

Text Books

1. Tickoo and Subramanian, "Functional Grammar"
2. Pink and Thomas, " English Grammar. Composition and Commercial Correspondence"
3. Hema Srinivasan, Alamelu Ramakristhna, Valli Arunachalam "Communication Skills -A Practical Approach", Frank Bros. and Co.
4. Dr. V. Ayothi and Dr. R. Vedavali ," English for competitive examination", New century book house, 2002

FUNDAMENTALS OF COMPUTER SCIENCE

Unit I

Introduction to Computers- Generations of Modern Computers – Classification of digital Computer Systems- Anatomy of a Digital Computer

Unit II

Boolean Algebra and Logic Circuits
Input Devices: Keyboard, Mouse, Track ball, Joystick, Scanner, Digital Camera, MICR, OCR, Barcode Reader, Touch Screen, Light Pen.
Output Devices: Monitor, Printer, Plotter, Sound Card and Speaker.

Unit III

Memory Units: RAM, ROM, PROM, EPROM, and EEPROM
Auxiliary Storage Devices: Magnetic storage devices-Floppy Diskettes, Hard disks, Removable Hard disks, Magnetic Tapes. Optical Storage - CD-ROM.

Unit IV

Programming Languages; Machine Language, Assembly Language, High Level Language, Types of High Level Language, Compiler and Interpreters

Unit V

Introduction to Software Development: Defining the Problem, Program Design, Coding, Testing, Documenting, and maintaining the program.

Text Book

1. Alexis Leon and Mathews Leon "Introduction to Computers", Leon TECHWorld, 1999

Reference

1. Peter Norton's "Introduction to Computers, Fifth edition", Tata McGraw Hill Publications 2004

MAJOR PAPER – II

INFORMATION TECHNOLOGY

Unit I

Number Systems-Decimal, Binary, Octal, Hexadecimal Conversion from one number system to another, Complements, Binary coded Decimal, Bits, Bytes and Words

Unit II

Data Processing: Data Versus Information, File Processing, Data Processing – Introduction to DBMS, Distributed Systems

Unit III

Overview of Network, Communication Processors, Communication Media, Types of Network, Network Topologies, Network Protocols, Network Architecture. Introduction to Internet & WWW, E-mail, Intranet

Unit IV

Introduction to Multimedia-Multimedia Tools-Introduction to Virtual Reality-Electronic Commerce

Unit V

1. Introduction to Computer Security-Cryptography-Computer Viruses, Bombs & Worms

Text Books

1. Alexis Leon and Mathews Leon "Fundamentals of Information Technology", Leon TECWorld, 1999

2. Alexis Leon and Mathews Leon "Introduction to Computers", Leon TECHWorld, 1999

FIRST SEMESTER

MAJOR PAPER – III

PROGRAMMING CONCEPTS AND C

Unit I

Introduction to Programming – Algorithms, Flowchart, Source Program, Object Program, Compilers, Interpreters, Assemblers, Modular Programming: Structured Programming, Top-down approach, Stages of Program Development

Unit II

Introduction - C character set, Identifiers and keywords. Data type, Declarations, Expressions, statements and symbolic constants, Input-Output: getchar, putchar, scanf, printf, gets, puts, functions, Pre-processor commands, #include, define, preparing and running a complete C program. Operators and expressions: Arithmetic, Unary, Logical, bit-wise, assignments and conditional Operator, Library functions.

Unit III

Control statements: While, do-while, statement, nested loops, if-else, switch, break, continue and goto statements, comma operator. Arrays: Defining and processing. Multi dimensional arrays. Strings and operations on strings.

Unit IV

Functions: Defining and accessing: Passing arguments, Function prototypes, Recursion. Use of library functions, Storage classes: Automatic, external and static variables.

Unit V

Pointers: Declarations, Passing to a function. Operations on pointers, pointer and arrays. Array of pointers. Structure: Defining and processing. Passing to a function, Union.
Data Files: Open, close, create, process unformatted data files.

Text Book

1. Byron S. Gottfried, "Programming with C , Schaum's Outline Series", TMH ,2nd Edition 1998

References

1. Kris A. Jamsa , "Programming in C " , Galgotia Publications PVT.Ltd.,1998.
2. Kernighan, B.W..,and Ritchie, D.M.., "The C Programming Language" Prentice Hall of India, 1989.

ALLIED PAPER – I

MATHEMATICS FOR COMPUTER SCIENCE

Unit I

Matrices – definition – special types of matrices – operations – symmetric matrices – skew symmetric matrices – Hermitian and skew Hermitian matrices – Inverse – Orthogonal matrices – Solutions of Simultaneous equations – Rank of a matrix – Eigen values and eigenvectors – Cayley Hamilton Theorem.

Unit II

Mathematical Logic – Connectives – Statement Forms – Paranthesis – Truth Table – Tautology and Contradiction/Logical Implications and equivalences – Disjunctive and Conjunctive normal forms.

Unit III

Sets – Relation – functions – Poset – Hasse Diagram – Lattice and its Properties – Boolean Algebra – Properties – Karnaugh Map (Two, Three and Four Variables Only).

Unit IV

Graph Theory: Introduction – application of graphs – Finite and Infinite Graphs – Incidence and Degree – Isolated Vertex, Pendant Vertex and Null Graph. Paths and Circuits – Connected Graph, Disconnected Graphs and components – Euler Graphs – Operations on Graphs – Hamiltonian Paths and Circuits

Unit V

Trees and Fundamentals Circuits: Trees – Some properties of Trees – Pendant Vertices in a Tree – Distance and Centers in a Tree – Rooted and Binary Trees – On Counting Trees – Spanning Trees – Fundamental Circuits

Text Books

1. Manicavachagom Pillay and others ,"Algebra",11th Revised edition. Vol II.,S.V. Publications, (Unit – 1)
2. Narsingh Deo, "Graph Theory with applications to Engineering and Computer Science", PHI, 1997. (Unit –4, 5)
3. Trembly & Manohar, "Discrete Mathematics for Computer Science", TMH, 1997 (Units – 2, 3).

FIRST SEMESTER

PRACTICAL - I

OFFICE AUTOMATION LAB

MS-WORD

1. Text Manipulations and Text Formatting
2. Usage of Bookmarks, Footnotes, Columns & Hyperlink
3. Usage of Header, Footer, Bulleting and Numbering & Borders and Shading
4. Usage of Tables - Sorting & Formatting
5. Usage of Spell Check, Find and replace
6. Picture insertion and alignment
7. Creation of documents using templates
8. Mail Merge, Envelopes and Labels

MS-EXCEL

9. Cell Editing and Formatting
10. Usage of Formulae and Built-in functions
11. Data Sorting, filter, form, subtotal, validation, Goal seek
12. Inserting Clip arts, objects, pictures and Data Filter, Validation, Subtotals
13. Usage of auditing, comments
14. Graph
15. Usage of Auto Formatting, Conditional Formatting & Style

POWER POINT

16. Inserting New slides, text box, object, charts, tables, pictures, movies and sound
17. Slide layout, Colour Scheme, Background and Design template
18. Preparation of organizational charts
19. Preset and custom animation, action buttons and settings, Slide Transitions and animations, view show, slide sorter view
20. Presentation using Wizards
21. Usage of Design templates

FIRST SEMESTER

PRACTICAL - II

C LAB

1. Check for Prime Number, Armstrong number, Fibonacci
2. Summation of the series: Sin (x) , Cos(x), Exp(x)
3. String Manipulations
    a. Counting number of vowels, consonants, words, white spaces in a string
    b. Reversing a string and check for palindrome
    c. Finding the number of occurrences of a sub string in a given string
    d. Sub string replacing and removal
4. Recursion
    a. Factorial
    b. Reversing a string
    c. Fibonacci Sequence
    d. Tower of Hanoi
5. Matrix Manipulations using functions and Case structure
    a. Addition & Subtraction
    b. Multiplication
    c. Transpose
    d. Check if the given matrix is a Magic square
6. Searching
7. Sorting
8. Structures
9. Pointers
10. Files

ENGLISH II

Unit I

Study Skills:
a) How to use a dictionary and a library.
b) Effective writing -reasoning out passages.
c) Reading Comprehension.
d) Note-taking.

Unit II

Precise writing

Unit III

Report writing -Technical and Scientific report writing. Information Transfer -Tables, Graphs, Organograms, Pie-charts, Bar-charts, Schematic diagrams.

Unit IV

Commercial Correspondence (The form and arrangement of commercial letters -varieties)
a) Trade Inquiries
b) Orders, Offers, Quotations
c) Confirmation and Execution of orders
d) Refusal and Cancellation of orders
e) Letters of Complaints
f) Circular letters
g) Sales letters

Unit V

Drafting
a) Drafting of official/non-technical reports (routine and non-routine)
b) Drafting of minutes, short speeches, memoranda, News releases, Postal cards and Reply cards, Telegrams, Mailgrams, Cablegrams, Radiograms.
c) Application for a situation (Curriculum vitae etc.,)

Text Books

1. Hema Srinivasan, "Communication Skills: A Practical Approach"
2. Fletcher & Gowing," The Business Guide to Effective Writing", Newlight Publications, New Delhi.
3. Wilna R. Ebbit & David R. Ebbit, "Writers Guide (6th edition)".

SECOND SEMESTER

MAJOR PAPER – IV

OBJECT ORIENTED PROGRAMMING

Unit I

Introduction to Object Oriented Programming (OOP), C++ programming basics, Loops and decisions: Relational operators, loops, decision, logical operators, precedence.

Unit II

Structures, enumerated data types. Functions: Simple functions, passing argument to functions, returning values from functions, reference arguments, overloaded functions, inline functions, variable and storage classes

Unit III

Objects and classes: classes and Objects, Specifying the class, using the class, constructors, deconstructors, objects as function arguments, returning objects from function. Arrays: Arrays fundamentals, Arrays a Class member data, Array of objects, Strings. Operator overloading: unary operator, overloading binary operators, Data conversion, Pitfalls of Operator overloading and conversion.

Unit IV

Inheritance : Derived Base class, derived class constructors, overloading member functions, class hierarchies, public and private inheritance, levels of inheritance, multiple inheritance.Pointers: Address and pointers, pointers and arrays, pointer and functions, pointers and strings, Memory management, pointer to objects.

Unit V

Virtual functions and other functions: Virtual functions, Friend functions, Static functions, this pointer. Files and Stream: String I/O, Object I/O, I/O with multiple objects, file pointer, disk I/O with member functions.

Text book

1. Robert Lafore, "Object – Oriented Programming in C++ ", Galgotia Pub, 2001.

SECOND SEMESTER

MAJOR PAPER – V

FUNDAMENTALS OF DATA STRUCTURES

Unit I

Introduction – Sparks – How to create programs – How to analyse programs -Arrays: One-dimensional Array, Two-dimensional array, Application: Sparse matrices, String. Search - Linear search, Binary search and Hashing. Two- way merge-Sorting by Selection, Sorting by exchange, sorting by insertion, sorting by partitioning

Unit II

Stacks: User defined data structure, Stack- Operations on stack, Implementation of stack as an array, Application – Evaluation of Expression & Conversion -Queues: Queue, Operations on Queues, Implementing the queue, Application.

Unit III

Linked List: The Storage pool, List representations, Anatomy of a node, Implementing the list operations, inserting into an ordered list, deleting from a list , Doubly linked list, Keeping a stack in a linked list, keeping a queue in a linked list. Polynomial- Linked list representations.

Unit IV

Trees: Basic terminology, Binary tree, representation, traversal, Binary search tree, threaded binary tree, Application [game tree].

Unit V

Graph: Definition and Terminology, representation, traversals, Connected Components and Spanning Tree, Shortest Path

Text Book

1. Ellis Horowitz & Sahani, "Fundamentals of Data Structures", Galgotia Publications, New Delhi, 1983.

SECOND SEMESTER

ALLIED PAPER – II

PROBABILITY AND STATISTICS

Unit I

Introduction to Statistics – Nature and scope of statistical methods and their limitations - Primary and Secondary data – Classification, tabulation and diagrammatic representation of statistical data - Bar-charts, Pie-diagrams - Graphical Representation of data –Histograms, Frequency polygon, Ogives

Unit II

Measures of central tendency – Arithmetic mean, Median, Mode, Geometric mean, Harmonic mean- properties – merits and demerits – graphical location of median, quartiles, deciles, percentiles, and mode – Measures of dispersion – Quartile deviation – mean deviation & standard deviation characteristics – coefficient of dispersion – coefficient of variation – moments

Unit III

Skewness and Kurtosis – Pearson's coefficient of skewness – Bowley's coefficient of skewness – coefficient of skewness based upon moments - Simple correlation – Karl Pearson's coefficient. of correlation – Rank correlation – Regression – lines of regression – properties of regression coefficient

Unit IV

Events and sets – sample space – concept of probability – addition and multiplication theorem on probability – conditional probability and independence of events – Baye's Theorem- Concept of random variable – Discrete and Continuous random variable - Mathematical expectation – Simple problems based on Binomial, Poisson and Normal distribution

Unit V

Chi-square test for independence of attributes and contingency table – Test of significance for small samples – Students t distribution – t test for the significance of single mean – t test for difference between the means of two populations – paired t test - F test for variances of two populations – Analysis of Variance for one way & two way classification (problems only)

Text Book

1. Gupta S. C and Kapoor V. K., "Fundamentals of Mathematical Statistics", 11th Edition, S. Chand and Sons 2002.
2. Hooda R.P., "Statistics for Business and Economics", 3rd Edition, Mac Millan 2003.

Marks distribution

Theory – 40%
Problems – 60%

FUNDAMENTALS OF ACCOUNTANCY

Unit I

Accounting – Introduction-Meaning-Accounting and book keeping distinguished-objectives of accounting-Branches of accounting-accounting concepts and conventions-accounting standards in India-systems of Accounting

Unit II

Double entry system-personal accounts, real accounts, nominal accounts-journal-ledger-preparation of trial balance-rectification of errors.

Unit III

Subsidiary books including cash book , bank Reconciliation statement

Unit IV

Preparation of trading account- preparation of profit and loss account and balance sheet-Final accounts with adjustments

Unit V

Basics of cost Accounting – Basic Concepts- Elements of cost – prime cost – works cost – cost of production – concept of inventory – reorder level – minimum level – maximum level – average level – safety stock

Ratio Analysis – Liquidity ratios – activity ratios – structural ratios – Profitability ratios – dupont analysis

Text Books

1. S.N. Maheswari, "Advanced Accountancy Vol I", Vikas Publishing
2. R.L. Gupta, "Advanced accounting", S. Chand & Co. New Delhi
3. Pillai and Baghawati, "Cost Accounting"
4. Jam and Narang, "Cost Accounting", Kalyani Publications
5. T.S. Reddy & Murthy, "Financial Accounting"
6. Jain & Narang, "Financial Accounting"
7. M. C. Shukla & T.S.Grewal, "Financial Accounting"

Mark Distribution:

Theory -20 marks
Problem - 80 marks

SECOND SEMESTER

PRACTICAL - III

OOP (C++) LAB

1. Simple Programs using decisions, loops and arrays
2. Simple functions & Inline functions
3. Function overloading & Operator Overloading
4. Usage of classes and Objects
5. Constructors and Destructors
6. Inheritance & Multiple Inheritance
7. Pointers
8. Virtual Functions, Friend functions, this pointer and Static functions
9. Files
10. Streams

SECOND SEMESTER

PRACTICAL - IV

DATA STRUCTURES LAB

1. Linear Search
2. Binary Search
3. Sort by Selection
4. Sort by Exchange
5. Quick sort
6. Stacks, Queues using arrays
7. Linked List: Insertion and Deletion
8. Polynomial addition using linked list
9. Stack and Queue using Linked List
10. Doubly linked List: Insertion and Deletion
11. Binary tree Traversal [inorder, preorder, postorder]
12. Graph Traversal [breadth first, depth first]

COMPUTER ORGANIZATION

Unit-I

NUMBER SYSTEMS : Decimal – Binary – BCD – Octal – Hexadecimal and other number systems – Binary arithmetic operations.

BOOLEAN ALGEBRA AND GATES : Boolean algebra – DeMorgan's theorem – Derivations of Boolean expressions – sum of products and product of sums – K Map method for simplifying expressions – Design using NAND and NOR gates.

Unit-II

LOGIC DESIGN : Binary Half adder, Full adder, binary parallel adders, multiplexer, decoder, encoder, demultiplexer. Flip-flops – shift register – counters. Functional units of computer – operational concepts – stored program concept.

Unit-III

Processor Logic Design – Processor Organization – Arithmetic Logic Unit – Design of Arithmetic Circuit – Design of Logic Circuit – Design of Arithmetic and Logic Unit – status register – Design of Accumulator.

Unit-IV

MEMORY ORGANIZATION : Memory hierarchy – Main memory operations – memory mapping.
ADDRESSING METHODS AND MACHINE PROGRAM SEQUENCE : Instruction formats – Instruction sequencing – Addressing Modes – Stacks – subroutine and linkage.

Unit-V

INPUT-OUTPUT ORGANIZATION : Peripheral Devices – I/O Interface – Asynchronous Data Transfer – Modes of Transfer – DMA.

Text Books

1. Morris Mano, Digital Logic and Computer Design, PHI 1987.
2. M.Morris Mano, Computer System Architecture, PHI 1986.
3. Ramesh S. Gaonkar , Microprocessor architecture, Programming and Application, Wiley Eastern Limited, 1985.

Reference Book
1. V.Karl Hamacher, Zvokog G. Vranesic and Safwat G.Zaky, Computer Organization, McGraw Hill ISE, 1984.

JAVA PROGRAMMING

Unit I

Object Oriented Concepts : Encapsulation, Inheritance, Polymorphism. Introduction to Java -Features of Java - Data Types -Variables -Arrays -Operators -Control Statements.

Unit-II

Introducing Classes – Methods and Classes – Inheritance

Unit-III

Packages and Interfaces-Exception Handling – Multithreaded Programming

Unit-IV

String Handling – The Java I/O classes and Interfaces: File, Byte Stream, Character Stream - Applet Class - Event Handling

Unit-V

Introduction to AWT: Working with Windows, Graphics and Text – Using AWT Controls, Layout Managers and Menus - Images

Text Book

1. Herbert Schildt "Java2 (The Complete reference) – Fourth Edition" TMH, Fifth Reprint 2002 (Chapters 2,3,4,5,6,7,8,9,10,11,12,13,17,19,20,21,22)

MAJOR PAPER – VIII

COMPUTER ALGORITHMS

UNIT I

Introduction – What is an algorithm? Writing structured programs – Analyzing Algorithms –Heap and heap sort – Graphs- hashing.

UNIT II

Divide and Conquer ; The general method – Binary search – Finding the maximum and minimum – Merge Sort – quick sort – selection – Strassen's matrix multiplication .

UNIT III

The Greedy method ; the general method – optimal storage on tapes – knapsack problem – job sequencing with deadlines-optimal merge patterns –minimum spanning tree- tree vertex splitting.

UNIT IV

Dynamic programming ; General method – multistage graphs .Backtracking – The General method – The 8 Queen problems – Sum of subsets –Graph coloring

UNIT V

Branch and bound – The Greedy method-0/1 Knapsack problem – Traveling Salesman problem.

TEXT BOOK

Ellis Horowitz and Sartaj Sahni, "Fundamentals of Computer Algorithms", Galgotia Publications Pvt. Ltd.

REFERENCE

Aho A.V. & Hopercraft.E. , "Design and Analysis of algorithms "
Addison Wesley.

ALLIED PAPER – IV

FINANCIAL MANAGEMENT

Unit I

Indian Financial System – India Capital market – India Money Market – Their characteristic features – Commercial Banks and reserve bank of India – Their functions – Developmental Financial Institutions – UTI – IDBI – IFCI – ICICI – SIDBI

Unit II

Stock exchange – functioning – SEBI – Powers and functions of SEBI – Merchant banking underwriting – stock broking and trading systems - OTCEI

Unit III

Management of financial services – Factoring – Forfeiting – Leasing – credit and credit rating – Mergers, restructuring takeovers – venture capital financing – project financing

Unit IV

Financial Management – Meaning – Objectives – Importance – Capital Budgeting – Traditional Techniques – discounted cash flow Techniques – NPV Vs IRR cost capital – Leverage – EBIT – EPs analysis

Unit V

Working capital management – Operating cycle – Inventory management – EOQ – Cash management – Accounts receivables management

Text Books

1. M. Y. Khan and Jain, " Financial Management", TMH, New Delhi
2. I. M. Pandey, "Financial Management", Vikas New Delhi
3. S. N. Maheswari, "Financial Management", Sultan Chand & Sons
4. Prasanna Chandra, "Financial Management, Theory and Practice", Tata Graw Hill
5. Ramachandran & Srinivasan , "Management Accounting – Theory & practice"

Note:
Theory 60 Marks
Problem 40 Marks

ALLIED PAPER – V

OPERATION RESEARCH

Unit I

Introduction to Operations Research - Principal components of decision problems - phases of OR study.

Unit-II

Linear Programming - graphical solution - simplex method including artificial variable technique - duality.

Unit III

Transportation and assignment models - Sequencing

Unit IV

Game theory - optimal solution of two-person zero-sum games - mixed strategies - graphical solution of (2 X n) and (m X 2) games - solution of (m X n) games by linear programming.

Unit V

PERT and CPM - network diagrams - determination of the floats and critical path - probability considerations in project scheduling.

Text Books

1. Treatment as in Hamdy A.Taha "Operations Research - An introduction (III edition)", chapters 1, 2, 3 (omit 3.4), 4 (omit 4.4, 4.5), 5 (omit 5.4), 11 (omit all sections except 11.4 only), 12 (omit 12.3, 12.5).
2. R.L. Ackoff and M.W.Sasieni "Fundamentals of O.R.". (For Sequencing)

THIRD SEMESTER

PRACTICAL V

JAVA PROGRAMMING LAB

I Application

1. Finding area and Perimeter of a circle. Use buffered reader class
2. Substring removal from a string. Use StringBuffer class
3. Determining the order of numbers generated randomly using random class
4. Implementation of Point class for image manipulation
5. Usage of calendar class and manipulation
6. String manipulation using char array
7. Database creation for storing telephone numbers and manipulation
8. Usage of vector classes
9. Implementing thread based applications and exception handling
10. Implementing Packages

II Applets

11. Working with frames and various controls
12. Dialogues and Menus
13. Panel and Layout
14. Graphics
15. Colour and Font

THIRD SEMESTER

PRACTICAL VI

FINANCIAL & STATISTICAL PACKAGES LAB

Unit – I
    Financial Packages such as TALLY

Unit-II

1. Diagramatic Representation : Bar-charts, Pie-diagrams
2. Graphical Representation of data –Histograms, Frequency polygon
3. Measures of central tendency – Arithmetic mean, Median, Mode
4. Measures of dispersion
5. Skewness and Kurtosis
6. Simple correlation
7. Regression – lines of regression
8. Tests of significance based on t
9. Tests of significance based on chi-square
10. Tests of significance based on F

Note: The above mentioned statistical problems can be solved using SPSS or Excel Worksheet

FOURTH SEMESTER

MAJOR PAPER – IX

OPERATING SYSTEMS

Unit I

Operating Systems – Introduction – Basic Concepts and terminology – As OS Resource Manager – OS process view point – OS hierarchical and extended machine view – Memory management: Single contiguous memory allocation – Introduction to multiprogramming – Partitioned memory management.

Unit II

Memory management: Relocatable partitioned memory management – Paged memory management – Demand paged memory management – Segmented memory management – Segmented and Demand – Paged memory management – Swapping and Overlays.

Unit III

Processor management – State model – Job scheduling - Process scheduling – Multi Process system – Process Synchronization.

Unit IV

Device Management: Techniques for Device Management – Device Characteristics – Channels and Control Unit – Device Allocation – I/O Controller, Scheduler, Device Handler-Virtual Devices

Unit V

Information Management : A simple file system- General Model of a File System – Symbolic File System – Basic File System – Access Control Verification – Logical file system – Physical file system – Allocation strategy module.

Text Book

1. Stuart E.Madnick and John Donovan "Operating System",TMH Fifth Reprint 2000. (Chapter 1,3,4,5,6)

FOURTH SEMESTER

DATA COMMUNICATION AND NETWORKS

Unit-I
Introduction: Data Communications, Networks, Protocols and Standards. Basic Concepts: Line Configuration, Topology, Trans mission mode, Categories of Networks.**OSI Model:** Layered architecture, Functions of the layers, TCP/IP Protocol suite

Unit—II
Signals: Analog and digital, periodic and aperiodic signals, analog signals, Digital signals.
Transmission media: Guided media, unguided media. **Multiplexing**: FDM, WDM,TDM, Multiplexing Application-The Telephone system.LAN: Project, Ethernet, Other Ethernet networks, Token bus, Token Ring, FDDI, Comparision.

Unit-III
Switching: Circuit Switching, Packet Switching, Message Switching. **ISDN:** Services, ISDN Layers, Broadband ISDN. **Frame Relay:** Introduction, operation, Congestion control. **ATM:** ATM Layers applications**. SONET:** physical configuration, SONET layers, Applications

Unit-IV
Networking and internet working devices: Repeaters, Bridges, Routers, Gateways, other devices, Routing algorithms, Distance vector routing , link state routing. **Transport layer**: Duties ,Connection
TCP/IP Protocol suite: **Overview of TCP/IP**: Internet protocol, Addressing, Subnetting.

Unit-V
Other protocols in the network layer: ARP, RARP, ICMP, IGMP Transport layer: TCP UDP
TCP/IP Protocol suite : PART-2 Application ayer: Client server model, BOOTP,DHCP
DNS, FTP,SMTP,,WWW,HTTP.

Text-Book
> Data Communication & Networking – Behuouz A. Forouzan, 2nd Edition Tata McGraw-hill Edition

References:
1.   Computer Networks – A.S Tanenbaum, Pearson Education
2.   Data and Computer communications Seventh edition William Stallings PHI

VISUAL PROGRAMMING

UNIT I

Introduction to GUI - Visual Basic : Starting and Exiting Visual Basic – Project Explorer – Working with Forms – Properties Window – Using the Toolbox – Toolbars – Working with Projects – Programming Structure of Visual Basic applications – Event and Event driven procedures

UNIT II

Adding code and using events: Using literals – data types - declaring and using variables – using the operator – subroutines and functions – looping and decision control structures – if then else structure – select structure , for next , do.. loop and while.. wend.- Using intrinsic Visual basic Controls with methods and Properties: Label ,Text box, Command button, Frame, Checkbox, option button, List box, Combo box, Drive List box, directory List box and file list box – Formatting controls – control arrays, Tab order

UNIT III

Functions and Procedure - Passing arguments by value and reference – Arrays, dynamic arrays – User defined data types – symbolic constants – using Dialog boxes: Input box , Message box functions - String functions, date and Time function , numeric functions

UNIT IV

Menus: creating menus, adding code to menus, using MDI forms - MDI form basic – building MDI form – creating MDI Child Forms

UNIT V

Database object (DAO) and properties – accessing Recordset objects – Move first, MoveLast, MovePrevious and MoveNext methods – Begin , Commit and Rollback transaction – accessing Microsoft Access files. Active Data Objects (ADO) ADO and OLE DB and ADO Primer – What are OLE DB and ADO? – ADO object Model – Converting DAO Code to Use ADO – Connecting to the database – Retrieving a recordset – Creating a query dynamically – Using a parameterized query – using action queries - Adding records – Editing records –closing the database connection*.*

TEXT BOOKS
1. Gary Cornwell "Visual basic 6", Tata McGraw –Hill
2. Scott warner "Teach yourself Visual basic 6", Tata McGraw-Hill
3. Noel Jerke "The Complete Reference", Tata McGraw-Hill
4. Eric A. Smith, Valar Whisler, and Hank Marquis "Visual Basic 6 programming"

MAJOR PAPER – XII

DATABASE MANAGEMENT SYSTEMS

Unit - I

Introduction to Database System- Objectives- Entities and Attributes – Data Models

Unit-II

Database Management Systems – Tree Structures – Plex Structures – Data Description Languages. Relational Databases – Third Normal Form – Canonical Data structures - Varieties of data independences.

Unit -III
Basic SQL reports and commands – Datatypes and notations – String functions – Data functions – Unions – Joints – DDL – DML – DLL.

Unit-IV
PL/SQL: Approach and Advantages –PL/SQL Blocks -Variables-Manipulating Data – Triggers – Procedures, functions and packages - Exception handling

Unit-V

Locking Techniques – Time stamp ordering – Validation techniques - Granularity of data items – Recovery Concepts -   log based Recovery – Database Security issues – Access Control – Statistical Database Security.

Text Book

1. James Martin, "Computer Database Organization", 2nd edition- PHI, 2001
2. Kevin Loney, George Koch , "Oracle 8i The Complete Reference- 10th Edition"
3. Henry F. Korth Abraham Silberschatz , "Database System Concepts ",
   Fourth Edition – McGraw – Hill International Editions 2002

FOURTH SEMESTER

ALLIED PAPER – VI

PRINCIPLES OF MANAGEMENT

Unit I

Meaning, Definition and importance of Management-Functions of a Manager-Management process-Role of a manager-Social responsibility of management-Co-ordination-Meaning and scope requirements of effective co-ordination-problems in co-ordination.

Unit II

Meaning and purpose of planning – steps in planning process-limitations-Types of plans, objectives, Strategies, policies, procedures, programmes, management by objectives (MBO) – Decision making- Types of decisions-process of decision making-difficulties in decision making

Unit III

Nature and purpose of organizations-different forms of organizations-merits and demerits – linear and staff concepts- organisational charts- departmentations - bases for departmentation - product, function and territory-span of management

Unit IV

Authority-responsibility-accountability-delegation of authority-principles of delegation-unity of command – centralization and decentralization –advantages and disadvantages

Unit V

Nature and scope of direction-motivation meaning-major theories of motivation – Maslow's theory - Herbertg's two factor theory-Leadership styles-Nature and purpose of controlling

Text Book

1. Kathiresan and Radha, " Business Management", Bhavani publications, Chennai

Practical VII

VISUAL PROGRAMMING AND RDBMS LAB (SQL)

Unit – I (Visual Basic)

1. Building simple applications
2. Working with intrinsic controls and ActiveX controls
3. Application with multiple forms
4. Application with dialogs
5. Application with Menus
6. Application using data controls
7. Application using Common Dialogs
8. Drag and Drop Events
9. Database Management
10. Creating ActiveX Controls

Unit – II (SQL)

Use the concepts like data normalization, link between table by means of foreign keys and other relevant database concepts for the following applications. The implementation of each should have necessary input screen (forms) Menu-driven query processing and reports. Necessary validations should be made for each table

1. Library information system
2. Students mark sheet processing
3. Telephone directory maintenance
4. Gas booking and delivering
5. Electricity bill processing
6. Bank Transaction
7. Pay roll processing
8. Personal information system
9. Question database and conducting Quiz
10. Personal diary

Practical VIII

COMPUTER NETWORKS LAB

Implementation using JAVA

1. Text Message Sending and Receiving
2. File Transmission
3. Basic Chat Application
4. Simple Mailing Application
5. Client Server Application

SOFTWARE ENGINEERING

Unit-I

Introduction to Software Engineering: Definitions -Size Factors -Quality and Productivity Factors -Managerial Issues-Planning a software project: Defining the problem –Developing a Solution Strategy -Planning the Development Process –Planning an Organization structure -Other Planning Activities.

Unit-II

Software Cost Estimation: Software cost factors - Software Cost Estimation Techniques - Staffing-level Estimation -Estimating Software Maintenance Costs -The Software Requirements specification -Formal Specification Techniques - Languages and Processors for Requirements Specification.

Unit-III

Software Design: Fundamental Design Concepts - Modules and Modularization Criteria - Design Notations –Design Techniques -Detailed Design Considerations -Real-Time and Distributed System Design -Test Plans -Milestones, walkthroughs, and Inspections. I

Unit-IV

Implementation issues: Structures Coding Techniques -Coding Style -Standards and Guidelines –Documentation guidelines -Type Checking -Scoping Rules –Concurrency Mechanisms.

Unit-V

Quality Assurance -Walkthroughs and Inspections - Static Analysis :.- Symbolic Execution -Unit Testing and Debugging -system Testing

Text Book

1. R. Fairley, "Software Engineering Concepts", Tata McGraw Hill Edition -1997.

FIFTH SEMESTER

MAJOR PAPER – XIV

.NET FRAMEWORK

Unit I

Introduction to the .NET Platform – Common Language Runtime(CLR) – The Common Type Specification(CTS) – The Common Language Specifications (CLS) – Assemblies - .NET Base Classes – CLR Debugger.

Unit II

Introduction to C# - Data Type – Operators – Flow Control and Iteration – Arrays and Strings – Basics of C# Classes – Boxing and Unboxing – Reflection – Interoperability – The Preprocessors – Attributes – Name Spaces.

Unit III

Object-Oriented Programming in C# - Encapsulation, Inheritance , and Polymorphism – Exception Handling – Garbage Collection – Input and Output (Directories ,Files, and Streams).

Unit IV

Implementing the IC1oneable and IComparable Interfaces – Introduction to .NET Collections (including Custom Collections) – Custom Indexers, Delegates and Events – Multithreading and Synchronization – Type Reflection and Attributes – Programming the Windows Registry.

Unit V

GDI+ Graphics Tutorial(including Fonts, Brushes, Images, and using .NET Resources) – COM, COM+, and .NET Interoperability – ADO.NET for Database Programming with Datasets and Object Model. – Windows Applications: Winforms – Winforms Namespace – Creating Winforms Applications in VS.NET – Developing Windows Applications.

Textbooks

1. 1.Robert J.Oberg, "Introduction to C# using .NET",PHI,2002.
2. 2.Andrew Troelsen, "C# and .NET Platform**,**Apress, 1ˢᵗ edition,2001.

References

1. Ben Albahari, Peter Drayton and Brad Merrill, "C# Essentials",SPD,2001.
2. "Microsoft C# Language Specifications", WP Publishers and Distributors Pvt.Ltd.,2001

MAJOR PAPER – XV

E-COMMERCE

Unit – I

Electronic Commerce Environment and Opportunities: Background – The Electronic Commerce Environment – Electronic Marketplace Technologies – Modes of Electronic Commerce: Overview – Electronic Data Interchange – Migration to Open EDI – Electronic Commerce with WWW/ Internet – Commerce Net Advocacy – Web Commerce going forward

Unit – II

Approaches to safe Electronic Commerce: Overview – secure Transport Protocols – Secure Transactions – Secure Electronic Payment Protocol(SEPP) – Secure Electronic Transaction (SET) – Certificates for Authentication - Security on Web Servers and Enterprise Networks – Electronic cash and Electronic payment schemes: Internet Monetary payment and Security requirements – payment and purchase order process – Online Electronic cash

Unit – III

Internet/ Intranet Security issues and solutions: The need for Computer Security – Specific Intruder Approaches – Security strategies – Security strategies – Security tools – Encryption – Enterprise Networking and Access to the Internet – Antivirus programs – Security Teams

Unit – IV

MasterCard / Visa secure Electronic Transaction: Introduction – Business Requirements – Concepts – Payment processing – E-mail and secure e-mail technologies for electronic commerce: Introduction – The Mean of Distribution – A model for message handling – How does e-mail work? MIME: Multipurpose Internet Mail Extensions – S/MIME: Secure Multipurpose Internet Mail Extensions – MOSS: Message Object Security Services

Unit – V

Internet and Web site establishment: Introduction – Technologies for Web servers – Internet tools relevant to Commerce – Internet Applications for Commerce – Internet charges – Internet Access and Architecture – Searching the Internet

Text Books

1. Daniel Minoli & Emma Minoli, "Web Commerce Technology Handbook", TataMcGraw-Hill, 1999.
2. K.Bajaj & D.Nag, "E-Commerce", TataMcGraw-Hill, 1999.

WEB TECHNOLOGY

Unit-1

Introduction to Internet – Resource of internet H/W & S/w requirement of Internet – Domain Naming system Registering our Domain name – URL protocol Server name Port Relative URLs- overview of web browsers – ISDN Dialup or Leased Line Connection – Internet Service Providers – Internet Services Protocols concepts Internet client and internet server introduction to WWW, HTTP, TCP/IP, FTP, SMTP, POP3 (Brief Treatment).

Unit-II

Introduction to HTML – Elementary tags in HTML – List in HTML – Displaying Text in Lists – Using Ordered List – Using Unordered Lists- Directory Lists - Definition Lists – combining List Typed – Graphics and Image Formats – Graphics and HTML document- image and hyperlink anchors – Image maps – Tables – Frames – Forms – Background Graphics and Color

Unit-III

Introduction to DHTML – Introduction to style sheets – Setting the default style sheet language – Inline style information – External Style sheets – Cascading Style sheets.

Unit-IV

Introduction to VBscript- declaring variables-adding Date and Time Function to Scripts-using Mathematical operators and functions- Using Conditional statement. Creating Functions-using Logical connectives and operators. A simple page VBscript and forms to server scripts.

Unit-V

Introduction to ASP – Database Management with ASP: Database access with ADO, working with ADO's Connection object, Using Command objects, Working with ADO's Recordset Object.

Text Books

1. Complete Reference: Internet
2. Elisabeth Freeman and Eric Freeman, " Head First HTML with CSS & XHTML (Head First",O'Reilly , 2005
3. Teach Yourself VBscript in 21 Days (Sams Teach Yourself Series.) by Keith Brophy and Timothy Koets
4. A.Russell Jones, "Active Server Pages 3", BPB Publications, 2000
5. Mary Jane Mara, " VB Scripts Source Book"
6. Paul Lemax and Reenald Petusha, " Learning VB Script"

FIFTH SEMESTER

PRACTICAL IX

WEB TECHNOLOGY LAB

1. Usage of Simple HTML commands, Graphics and image formats and hyperlinks
2. Usage of Tables, Frames, Forms, Background Graphics and Color
3. Simple Website using HTML
4. Simple DHTML and Cascading style sheet
5. Simple Vbscript
6. Web page using VBScript
7. ASP Application 1
8. ASP Application 2

FIFTH SEMESTER

PRACTICAL X

.NET LAB

Developing simple applications using C#

MAJOR PAPER – XVII

MULTIMEDIA APPLICATIONS

Unit I
Introduction: Multimedia elements – multimedia applications – System architecture – evolving technologies – defining objects – data interface standards – need for data compression – multimedia databases

Unit II
Multimedia data compression: Types of compression — color, gray scale and still video image compression – video image compression – audio compression . Data and file formats: RTF – TIFF – RIFF, MIDI, JPEG, AVI video file formats, MPEG standards.

Unit III
Multimedia I/O technologies: Pen input – Video and Image display systems – Print output technologies image scanners – digital voice and audio – digital camera – Video images and animation – full motion video. Multimedia storage and retrieval technologies: Optical media – hierarchical storage management – cache management for storage systems.

Unit IV
Multimedia application design: Types of Multimedia systems – Virtual reality design – components of multimedia systems Multimedia authoring systems: Hypermedia application design considerations. Hypermedia Messaging:mobile messaging Hypermedia message components, Hypermedia Linking and Embedding

Unit V
Distributed Multimedia Systems: Components – Distributed Client-Server operation – multimedia object servers – Multi-Server network topologies – Distributed multimedia databases – Managing distributed objects.

Text Books

1. Prabhat K. Andleigh, Kiran Thakrar, "Multimedia Systems Design", PHI 2002.

References

2. Tay Vaughan, "Multimedia making it works" Fifth Edition, TMH, 2001.
3. Jeffery Jefcoat, "Multimedia Systems and Application", TMH.
4. Fred Halsall, "Multimedia Communication Application Networks, Protocols and Standards", Addison Wesley, 2001.

PRACTICAL X

Multimedia LAB

1. Creating Title
2. Clip art Logo
3. Animated Buttons and Menus
4. Text Graphics
5. Morphing
6. Shape and Motion Tween
7. Creating Web site
8. Template
9. Working with Audio and video
10. Creation of banner

Tools Required:

Adobe/Macromedia studio Ver8.0 or higher
Sound Forge Ver 6.0 or Higher

INTRODUCTION TO WEB USER INTERFACE DESIGN

Unit – I
Introducing Web Navigation – Considering Navigation – The need for navigation – Web navigation design – Understanding Navigation – Information seeking – Seeking Information Online – Web browsing behavior – Information Shape – Experiencing information.

Unit – II
Mechanisms of Navigation – Step Navigation – Paging Navigation – Breadcrumb Trail – Tree navigation – Site Maps – Directories – Tag Clouds – A-Z Indexes – Navigation Bars and Tabs – Vertical menus – Dynamic Menus – Drop Down Menus – Visualizing Navigation – Browsing Mechanisms.

Unit – III
Types of Navigation - Categories of Navigation – Page types – Labeling Navigation – The Vocabulary Problem – Aspects of Good Labels – Labeling Systems.

Unit – IV
Evaluation - Qualities of successful navigation – Evaluation Methods.

Unit – V
Architecture – Persuasive Architecture – Navigation Concept – Information Structures – Organizational Schemes – Site maps.

Text Book :

1. James Kalbach, Designing Web Navigation Optimizing the User Experience,

O'Reilly Publications**.**

IT PROJECT MANAGEMENT

Unit I

The Nature of Information Technology Projects – Conceptualising the IT Project - Developing the Project Charter and Baseline Project Plan

Unit II

The Human Side of Project Management - Defining and Managing Project Scope

Unit III:

The Work Breakdown Structure and Project Estimation - The Project Schedule and Budget - Managing Project Risk

Unit IV

Project Communication, Tracking and Reporting– IT Project Quality Management

Unit V

Managing Organizational Change, Resistance and Conflict – Project Implementation, Closure and Evaluation.

Text Book

Jack T.Marchewka, "Information Technology and Project Management", John Wiley & sons P.Ltd,2003.

ELECTIVE - III

COMMUNICATION SKILLS

Unit-I

The fact and meaning of communication: the need for communication, the communication process, interpersonal communication, business communication, characteristics of business communication, many meaning of communication; direct communication, non-direct of written communication, non-method of communication, non-verbal communication, visual communication, audio-visual communication, Tele-communication.

Unit-II

Objectives of communication process, types of communication-internal and external communication, formal and informal channels, the grapevine, internal communication networks, downward communication, upward communication, horizontal communication, barriers to communication and how to hurdle them.

Unit-III

Public relations advertising- concepts and types, interviews: types and techniques, meetings, committees, conference and communication problems.

Unit-IV

Business reports, memoranda and representation, business correspondence: theory-principles of business correspondence, parts of a letter, forms / formats of letters.

Unit-V

Business correspondence in practice- applications, reference, testimonials, appointments, confirmation, promotion, termination, resignation enquiries and replies, orders and acknowledgements, substitute and firm offers, complaints and adjustments, credit & status enquiries, collection or settlements, circulars, sales, agency correspondence, import &export correspondence, insurance correspondence, secretarial correspondence, public speaking, precise writing.

Text Book
1. Rajendra Pal & J.S. Korlahalli, "Essentials of Business Communications", Sultan Chand & Sons
2. Ramesh C. pattanchetty, "Business communication"

CLIENT SERVER TECHNOLOGY

Unit – I

Introduction to Client/Server Computing - Mainframe centric Client/Server computing – Downsizing and Client/Server Computing – Preserving mainframe application investments through porting. Client/Server development tools – Client/Server Models- Advantages of Client/Server computing.

Unit – II

Components of Client/Server applications – The Client – Request for services – RPC, Window services, Fax/Print Services – Remote Boot services – other remote services – Utility and other services – DDE – OLE & CORBA. The server – Distributed Server Functionality – Request processing – File services – Fax/Print/Image services – Database Services – The NOS – Novell Netware – LAN manager.

Unit – III

Server OS – IBM LAN server – Banyan VINES – PC Network File Services – The Server OS: Netware, OS/2, Windows NT, Unix – System Application Architecture (SNA)

Unit – IV

Components of Client/Server Application - Connectivity – Open System Interconnect – Communication Interface technology – IPC

Unit – V

Client/Server Development- WAN Technology – Frame Relay – Switched Multi megabit Data services (SMDS) – ATM in Wide-area networks – ISDN – Client/Server Development Software – Platform Migration and Reengineering of existing system – Client/Server Hardware components – Client Hardware –Server Hardware – Client/Server connectivity components – Data Storage – power protection devices.

Text Book

1. Steve Guengrich & Patrick Smith, "Client/Server Computing"

Reference

1. Robert Orfali, Dan Harkey and Jerri Edwards, "Essentials of client/server computing"

WEB SERVICES

UNIT – I

Introduction to Web Services – SOAP – WSDL – UDDI – The Evolution of Web Application – Web Services & Enterprises – XML fundamentals

UNIT – II

SOAP and WSDL – The SOAP model – SOAP messages – SOAP Encoding - SOAP RPC – SOAP Encoding – REST Architecture – WSDL – Using SOAP and WSDL

UNIT – III

UDDI – UDDI Business Registry – UDDI Specification – Accessing UDDI – UDDI and Lifecycle Management – UDDI and Dynamic Access Point Management

UNIT – IV

Advanced Web Services Technologies and Standards – Conversations – Overview – Conversational requirements for B2B Interactions – Web Services Conversation Language – Relationship between WSCL and WSDL – WORKFLOW – business Process Management – Workflows and Workflow Management Systems – Business Process Execution Language for Web Services (BPEL)

UNIT V

TRANSACTIONS – ACID Transactions – Distributed Transactions and Two phase Commit – Dealing with Heuristic outcomes – scaling transactions to Web Services – OASIS Business transaction Protocol – SECURITY – Web Service Security issues

TEXT BOOK

1. Sandeep Chatteree & James Webber , " Developing Enterprise Web Services – An Architect's Guide " , Pearson Education

REFERENCE BOOK

2. Sanjiva weerawarana, Francisco Curbera," Web Services platform architecture ",
Prentice Hall, 2005

BIO-INFORMATICS

Unit – I

Introduction – Importance of Bioinformatics – Biological Sequence Structure – Deficit – Genome Projects – Status – Sequence analysis – Homology and analogy. EMBNET – NCBI – virtual Tourism. Primary Sequence Databases Biological data base – Primary Sequence Database – Composite Protein Sequence Database – Secondary Database - Composite Protein – Pattern database structure and classification of database.

Unit – II

Genome Information Resources - DNA Sequence data base – Specialised genomic Resources. DNA Sequence analysis : Why analyse DNA? – Gene structure – Features of DNA sequence analysis – Issues in the interpretation and EST search – Approach of Gene hunting – Cell CDNA libraries and ESTs – Approaches to EST analysis – Effect of EST data on DNA data base examples of EST analysis.

Unit – III

Data Base Searchers and Pair Wise Alignment Data base searching – Alphabets and Complexity – Comparing Two Sequences – Sub-Sequence – Identity and Similarity – Dot plots – Simple alignment – Gaps – Scoring Matrices – Dynamic programming – BLAST and its relatives – FASTA and related algorithms – Alignment scores and statistical significance of data base sequences. Global and local Alignments : Algorithms – Similarities – Semi global alignment

Unit – IV

Multiiple Sequence Alignment : Goal – Definition – Consensus – Complex – methods – Database of multiple Alignment – searching database with multiple alignment. .

Unit – V

Methods of Phylo Genetics.: Distance Based Methods – Character Based Methods – Comparison RNA Structure: Amino Acids – Polypeptide Composition – Modeling protein folding prediction, Tools – RNA Sequence Structure. Proteomics: Classification – Techniques.

Text Book

1.T.K.Attwood, D.J. Parry-Smith, " Introduction to Bioinformatics", Pearson Education Asia, 2003.

2.Dan E. Krane, Michale L. Raymer, " fundamental Concepts of Bioinformatics", Pearson Education Asia, 2003.

MOBILE COMMUNICATION

Unit I

Introduction − Medium access control − Telecommunication systems − Satellite systems − Broadcast systems.

Unit II

Standard − Wireless LAN − IEEE 802.11 − HIPERLAN − Bluetooth.

Unit III

Adhoc Networks − Characteristics − Performance issues − Routing in mobile hosts.

Unit IV

Network Issues − Mobile IP − DHCP − Mobile transport layer − Indirect TCP − Snooping TCP − Mobile TCP − Transmission / time-out freezing − Selective retransmission − Transaction oriented TCP.

Unit V

Application Issues − Wireless application protocol − Dynamic DNS − File systems − Synchronization protocol − Context − aware applications − Security − Analysis of existing wireless network.

Text books

1. J.Schiller, "Mobile Communication", Addison Wesley,2000.
William C.Y.Lee, "Mobile Communication Design Fundamentals", John Wiley,1993.

NETWORK SECURITY

Unit – I

Introduction –Attacks- Services- Mechanisms- Conventional Encryption-Classical and Modern Techniques-Encryption Algorithms-Confidentiality

Unit – II

Public key encryption- RSA- elliptive curve cryptography-number theory concepts

Unit – III

Message authentication-hash functions- digest functions-digital signatures – authentication protocols

Unit – IV

Network security practice-authentication applications-electronic mail security – IP security Web security

Unit – V

System security-firewalls-current standards

Text Book:

1. William Stallings, "Cryptography and Network Security -4th Edition", PHI,2005

Reference:

1. Bruce, Schneider, "Applied Cryptography,2nd Edition", Toha Wiley & Sons,1996.
   Dougals R.Stinson, "Cryptography- Theory and Practice",CRC Press,1995.

DATA WAREHOUSING AND MINING

Unit – I

Evolution of database technology – Introduction to Data warehousing and data mining

Unit – II

Data warehouse: Differences between operational database systems and data warehouses, multidimensional data model, data warehouse architecture, Data warehouse implementation

Unit – III

Data mining: Data preprocessing, Data mining primitives, languages & system architectures, concept description: characterization and comparison, Mining association rules, classification and prediction

Unit – IV

Applications and trends in data warehousing and data mining

Unit – V

Introduction to Microsoft's OLE DB for data mining, DBMiner.

Text Books

1. Sam anahory and Dennis murray, "Data warehousing in the real world", Addison Wesley, 1997.
2. Jiawei Han, et.al., "Data mining: concepts and techniques", Morgan Kaufmann publishers, 2001.

SOFTWARE TESTING

Unit – I

Software Testing Principles – Need for Testing – Psychology Of Testing - Testing Economics – White Box, Black Box, Grey Box Testing – SDLC and Testing – Verification & Validation – Weyker's Adequacy Axioms

Unit – II

Testing Strategies – White Box Testing Techniques – Statement Coverage – Branch Coverage – Condition Coverage – Decision/ Condition Coverage – Multiple Condition Coverage – Dataflow Coverage – Mutation Testing – Automated Code Coverage Analysis – Black Box Testing Techniques – Boundary Value Analysis –Robustness Testing –Equivalence Partitioning – Syntax Testing – Finite State Testing – Levels of Testing – Unit, Integration and System Testing

Unit III
Testing Object Oriented Software – Challenges – Differences from testing non-OO Software – Class testing strategies – Class Modality – State-based Testing – Message Sequence Specification.

Unit IV

Testability And Related Issues – Design for Testability – Observability & Controllability – Built-in Test – Design by Contract – Precondition, Post condition and Invariant – Impact on inheritance – Applying in the real world Regression Testing - Challenges – test optimization.

Unit V

Miscellaneous Topics – Automated Tools for Testing – Static code analyzers – Test case generators – GUI Capture/Playback – Stress Testing – Testing Client – server applications – Testing compilers and language processors – Testing web-enabled applications.

References

1. Glenford J.Myers, "The Art of Software Testing", John Wiley & Sons, 1979.
2. Boris Beizer, "Black – Box Testing Techniques for Functional Testing of software and systems", John Wiley & Sons, 1995.
3. P.C.Joregensen, "Software Testing – A Craftman's Approach", CRC Press, 1995.
4. William E.Perry, "Effective Methods for Software Testing (2nd Edition)", John Wiley & Sons, 2000.
5. Robert V.Binder, "Testing Object-Oriented Systems: Models Patterns and Tools", Addison Weasley, 2000.
6. Boris Beizer, Van Nostrand Rein hold, "Software Testing`` Techniques (2nd Edition)", 1990.

INTRODUCTION TO INTELLIGENT SYSTEMS

UNIT-I
Introduction : Intelligent Agents – Search Strategies – Solving Problems by Searching – Breadth–First – Depth-First – Depth-Limited – Iterative Deepening – Bidirectional – Informed Search Methods – A* - AO* - Games as Search Problems – Alpha-Beta Pruning.

UNIT-II
Representation: Propositional Logic – First Order Logic –Frame Systems and Semantic Networks

UNIT-III
Reasoning: Inference in First-Order Logic – Forward and Backward Chaining – Resolution – Unification- Logical Reasoning Systems.

UNIT-IV
Planning: Simple Planning Agent – From Problem Solving to Planning – Basic Representations for Planning – Practical Planners – Hierarchical Decomposition – Resource Constraints – Uncertainty – Probabilistic Reasoning Systems.

UNIT-V
Learning: General Model of Learning Agents – Inductive Learning - Computational Learning Theory – Learning in Neural and Belief Networks – Reinforcement Learning – Types of Communicating Agents – Robotics: Tasks, Parts, Configurations Spaces, Navigation and Motion Planning.

TEXTBOOK

1.Stuart J.Russell and Peter Norvig, **"**Artificial Intelligence", Tata McGraw Hill
 Publisher, 2nd Edition.

REFERENCE BOOKS

1. Elaine Rich and Kevin Knight, "Artificial Intelligence", Tata McGraw Hill
   Publisher-2nd Edition.
2. Dan W.Patterson, "Introduction to Artificial Intelligence and Expert Systems",
   Prentice Hall of India.
3. Patrick Henry Winston, "Artificial Intelligence", 3rd Edition, AW, 1999.
4. Nils.J.Nilsson, "Principles of Artificial Intelligence", Narosa Publishing House, 1992.

DISTRIBUTED DATABASE MANAGEMENT SYSTEM

Unit 1

Features of Distributed versus Centralized Databases – Why Distributed Databases – Distributed Database Management Systems (DDBMSs)- Review of Databases – Review of Computer Networks-Levels of Distribution Transparency- Reference Architecture for Distributed Databases.

Unit-2

Types of Data Fragmentation – Distribution Transparency for read-only Applications – Distribution transparency for Update Applications – Distributed Database Access Primitives – Integrity Constraints in Distributed Databases – A Framework for Distributed Database Design – The Design of Database Fragmentation – The Allocation of Fragments.

Unit-3

Equivalence Transformations for Queries – Transforming Global Queries into Fragment Queries – Distributed Grouping and Aggregate Function Evaluation – Parametric Queries - optimization of Access Strategies – A Framework for Query Optimization – Join Queries – General Queries.

Unit-4

A Framework for Transaction Management – Supporting Atomicity of Distributed Transactions – Concurrency Control for Distributed Transactions – Architectural Aspects of Distributed Transactions - Foundations of Distributed Concurrency Control – Distributed Deadlocks – Concurrency Control Based on Timestamps – Optimistic Methods for Distributed Concurrency Control.

Unit-5

Reliability – Basic Concepts – Non-blocking Commitment Protocols – Reliability and Concurrency Control – Determining a Consistent View of the Network – Detection and Resolution of Inconsistency – Checkpoints and Cold Restart - Distributed Database Administration – Catalog Management in Distributed Databases – Authorization and Protection.

Recommended Texts
1. Stefano Ceri, Giuseppe Pelagatti, Distributed Databases Principles & Systems, McGraw-Hill.
2. M.Tamer Ozsu, Patrick Valduriez, Distributed database systems, 2nd Edition, Prentice Hall of India, New Delhi.