BACHELOR OF SCIENCE
(INFORMATION TECHNOLOGY)

REGULATIONS, CURRICULUM & SYLLABI

(Effect from the Academic Year 2009-10)

PONDICHERRY UNIVERSITY
KALAPET
PONDICHERRY – 605 014.

PONDICHERRY UNIVERSITY

Bachelor of Information Technology
B. Sc (Information Technology)

REGULATIONS
(Effective from the academic year 2009 – 2010)

Aim of the Course

The Degree of Bachelor of Information Technology aims to introduce the students to Computer Science and Communication Technology. At the end of the course, the students are expected to have good working knowledge in Information Systems and Applications.

Eligibility for Admission

Candidates for admission to B.Sc. in Information Technology shall be required to have passed Higher Secondary Examination conducted by the Government of Tamil Nadu with Computer Science / Mathematics / Business Mathematics 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 Science
(Information Technology)
CURRICULUM

(Effective from the academic year 2009-10)

First Semester

Sl. No	Paper	Lecture Hrs/week	Practical Hrs/week	Duration of Exam	Max. Marks
1	Language I	6	-	3	100
2	English I	6	-	3	100
3	Main Paper I – Fundamentals of Information Technology	5	-	3	100
4	Main Paper II - Programming in C	4	-	3	100
5	Allied Paper I - Mathematics for Computer Science	5	-	3	100
6	Practical I -Office Automation Lab	-	2	3	100
7	Practical II – C Lab	-	2	3	100

Second Semester

Sl. No	Paper	Lecture Hrs/week	Practical Hrs/week	Duration of Exam	Max. Marks
1	Language II	5	-	3	100
2	English II	5	-	3	100
3	Main Paper III - Object Oriented Programming with C++	4	-	3	100
4	Main Paper IV – Fundamentals of Data Structures	5	-	3	100
5.	Allied Paper II - Numerical Methods	5	-	3	100
6	Practical III - OOP(C++) Lab	-	3	3	100
7	Practical IV - Data Structures & NM Lab	-	3	3	100

Third Semester

Sl. No	Paper	Lecture Hrs/week	Practical Hrs/week	Duration of Exam	Max. Marks
1	Communication Skills –I	5	-	3	100
2	Main Paper V – Digital Principles & Computer Organization	5	-	3	100
3	Main Paper VI - Data Base Management Systems	5	-	3	100
4	Main Paper VII - Java Programming	5	-	3	100
5	Allied Paper III – Principles of Management	4	-	3	100
6	Practical V – DBMS Lab	-	3	3	100
7	Practical VI - Java Lab	-	3	3	100

Fourth Semester

Sl. No	Paper	Lecture Hrs/week	Practical Hrs/week	Duration of Exam	Max. Marks
1	Communication Skills – II	5	-	3	100
2	Main Paper VIII- Data Communication & Computer Networks	5	-	3	100
3.	Main paper IX – Operating Systems	5	-	3	100
4	Main Paper X – E-Commerce	4	-	3	100
5	Main Paper XI – Visual Programming	5	-	3	100
6	Practical VII – Operating Systems & Computer Networks Lab	-	3	3	100
7	Practical VIII – Visual Programming Lab	-	3	3	100

Fifth Semester

Sl. No	Paper	Lecture Hrs/week	Practical Hrs/week	Duration of Exam	Max. Marks
1	Main Paper XII – Web Technology	4	-	3	100
2	Main Paper XIII - Information Security	5	-	3	100
3	Main Paper XIV - Software Engineering	5	-	3	100
4	Main Paper XV- Multimedia Technology	5	-	3	100
5	Elective – I	5	-	3	100
6	Practical IX- Web Technology Lab	-	3	3	-
7	Practical X – Multimedia Technology Lab	-	3	3	-

Sixth Semester

Sl. No	Paper	Lecture Hrs/week	Practical Hrs/week	Duration of Exam	Max. Marks
1	Main Paper XVI – Software Testing	5	-	3	100
2	Main Paper XVII – Mobile Computing	5	-	3	100
3	Elective – II	5	-	3	100
4	Practical XI – Software Testing CASE Tools Lab	5	-	3	100
5	Project Work	-	10	Viva - Voce	100*

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

List of Electives

1. Network Programming
2. TCP/IP
3. Cryptography
4. Client-Server Technology
5. Data Warehousing and Mining
6. Biometrics
7. Introducing to Bio-Informatics
8. Human Computer Interface
9. Software Quality Management
10. Middle Ware Technologies
11. Multimedia Database
12. Web Service

FIRST SEMESTER
MAIN PAPER – I
FUNDAMENTALS OF INFORMATION TECHNOLOGY

Unit-I

Introduction to Computers – Generation of Modern Computers-Classification of Digital Computer Systems – Anatomy of a Digital Computer –Input Devices**:** Keyboard, Mouse, Track Ball, Joystick, Digital camera, MICR, OCR, Barcode Reader, Touch Screen, Light Pen. Output Devices**:** Monitor, Printer, Sound Card, and Speaker.

Unit-II

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-III

Programming Languages: Machine Language, Assembly Language, High Level Language, Types of High Level Language, Compiler and Interpreter. .

Unit-IV

Number Systems: Decimal, Binary, Octal, Hexadecimal Conversion from one number system to another, Complements, Binary Coded Decimal, Bits, Bytes and Words. Overview of Network: Communication Processors, Communication Media, Types of Network, Network Topologies, Network Protocols, Network Architecture, Introduction to Internet & WWW, E-Mail, Intranet.

Unit-V

Introduction to Software Development: Defining the problem, Problem Design, Coding, Testing, Documentation and Maintenance the program. MS-Word, MS-Excel, Power Point.

Text Book:

1. Alexis Leon and Mathews Leon, "Fundamentals of Information Technology", Leon TECH World, 1999
2. Alexis Leon and Mathews Leon, "Introduction to Computers", Leon TECH World, 1999

Reference:

1. Peter Norton, "Introduction to Computers", TMH 6th Edition 1998 (for Units IV, V Chapters 13,14)

FIRST SEMESTER
MAIN PAPER –II
PROGRAMMING IN 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 statement, comma operator. **Array:** 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 Books:

1. "Programming in 'C' " by Byson.S.Gottfied, Schaum's Outline Series, 2nd Edition, Tata McGraw Hill, 2008.

Reference Book:

1. "Programming in C" by Kris A.Jamsa, Galgotia Publications PVT. Ltd, 1998.
2. "The C Programming Language" by Kernighan B.W. & Ritchie.D.M., Prentice Hall of India, 2nd Edition 2002.
3. E. Balaguruswamy, "Introduction to C"

FIRST SEMESTER

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, 2001. (Unit –4, 5)
3. Trembly & Manohar, "Discrete Mathematics for Computer Science", TMH, 2006 (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 and Footer, Bulleting and Numbering & Boarder 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 and 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, Validations, Goal seek
12) Inserting Clip Arts, Objects, Pictures and Data Filter, Validation, Subtotal
13) Usage of auditing, Comments
14) Graph
15) Usage of Auto Formatting, Conditional Formatting & Style.

POWER POINT

16) Inserting New Slides, Text Box, Objects, Charts, Tables, Pictures, Movies and Sound
17) Slide Layout, Color Schemes, Background and Design Template.
18) Preparation of Organization Charts
19) Preset and Custom Animation, Action Button 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 replace and removal
4. Recursion
    a. Factorial
    b. Reversing a string
    c. Fibonacci sequence
    d. Tower of Hanoi
5. Matrix Multiplication using functions and Case structure
    a. Addition and 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

SECOND SEMESTER

MAIN PAPER–III

OBJECT ORIENTED PROGRAMMING WITH C++

Unit - I

Object Oriented Programming: Software Evolution – OOP paradigm – Concepts, Benefits, Object Oriented Languages and Applications.

Unit – II

Introduction to the basic concepts of C++ language – Tokens, keywords, Identifiers, Data Types, Variables, Manipulations - Expressions and control structures – Functions: main function – function prototyping - call by reference - function overloading - friend and inline functions.

Unit - III

Classes and Objects – Constructors and Destructors – Operator Overloading – Type Conversions.

Unit - IV

Inheritance – Single Inheritance - Multiple Inheritance – Hierarchical, Hybrid Inheritance – Polymorphism – Pointers – Virtual Functions - Console I/O Operations.

Unit - V

Files – Classes for File Stream Operations –Opening, Closing and Processing files –End of file detection – File pointers - Updating a file – Error handling during file operations – Command Line Arguments – Templates – Exception handling.

Text Book:

1. E.Balaguruswamy, "Object Oriented Programming in C++" – Tata McGraw Hill Publishing Ltd., New Delhi., 2006.

Reference Book:

1) Robert Lafore , "Object Oriented Programming in C++" –Galgoita,2004.
2) Herbert Schilt, "C++ - The Complete Reference", 4th Edition, Tata Mcgrawhill, Pub-ltd., 2002
3) Yeswant Kanetkar , "Let us C++" – BPB Publications.,2008, 8th Edition.
4) John R.Hubbard , "Programming with C++" - Schaum's Outline Series 2007

SECOND SEMESTER
MAIN PAPER – IV
FUNDAMENTALS OF DATA STRUCTURES

Unit – I

Introduction: Sparks-How to create Programs – How to analysis Programs – **Arrays:** One Dimensional Array, Two - Dimensional Array, Application: Sparse Matrices, String Search – Linear Search, Binary Search and Hashing, Two-way Merge – Merge by Selection, Sorting by exchange, Sorting by Diminishing increment, sorting by partitioning .

Unit – II

Stacks: User defined data structure, stack- operations on stack, Implementation of stack as an array, Application- Maze Problem, 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, Doubly Linked List, Keeping a stack in a linked list, keeping a Queue in a linked list, Polynomial – Linked list representation.

Unit –IV

Trees: Basic Terminology, Binary Tree, Representation, Traversal, Binary Search Tree, Threaded Binary Tree, Binary Tree Representation of tree, Application: Game Tree, Minimum Spanning Tree, Krushkal's Algorithm and Prim's Algorithm.

Unit – V

Graph: Definition and terminology, Representation, Traversals, Shortest path.

Text Book:

1. **"Fundamentals of Data Structure"** by Ellis Horowitz & Sahani, Galgotia Publications, New Delhi.

Reference Book:

1. **"Theroy and Problem of Data Structure"** by Schaum's outling series, Tata McGraw Hill Publications.

SECOND SEMESTER
ALLIED PAPER – II
NUMERICAL METHODS

Unit - I

Solution of Transcendental and Polynomial Equations: Bisection methods – Newton Raphson Method – Methods of False Position – Secant Methods – Methods of Successive Approximations – Solution of Polynomial Equations by Newton Raphson Method.

Unit - II

Solutions to simultaneous equations by Back Substitution Method – Gauss Elimination Method – Gauss Jordan Method – Iterative Method - Gauss Seidel Method.

Unit - III

Interpolation – Finite Differences – Newton Forward and Backward Interpolation Formula – Operators and the relationship between them, Interpolations with unequal intervals, LaGrange's Interpolation formula.

Unit - IV

Numerical Differentiation – Difference Equations – Numerical Integration – Simpson's and Trapezoidal formulae.

Unit - V

Numerical Solutions of Ordinary Differential Equations (initial value problems) – Taylor Series Method – Euler Method, Runge Kutta Method – Predictor – Corrector Methods – Milness and Adams Method.

Text Book:

1) Rajaraman, "Computer Oriented Numerical Method" .

2) M.K.Venkataraman, "Numerical Methods in Science and Engg."

3) A.Singraavelu, "Numerical Methods for B.E.,B.Tech.,M.C.A" - Meenakshi Publications.

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 and Multiple Inheritance
7. Pointers
8. Virtual Functions, friend functions, this pointer and static functions
9. Files
10. Streams.

SECOND SEMESTER
PRACTICAL – IV
DATA STRUCTURES & NM LAB (Using C)

Data Structures

1. Linear Search & Binary Search
2. Sort by selection, exchange, quick sort
3. Stacks, Queues using arrays & Linked List
4. Singly Linked List : Insertion & Deletion
5. Doubly Linked List: Insertion & Deletion
6. Binary Tree Traversal (Inorder, Preorder, Postorder)

Numerical Methods

1. Solve f(x)=0 by Bi-Section Method
2. Find square root of N by Newton -Raphson Method
3. Solve n simultaneous equations with n – variables by Gauss – Sidel Method.
4. Tnterpolate the value of y for given value of x by Lagrange's Interpolation Method
5. Evaluate f(x) dx by Simpsons $1/3^{rd}$ rule
6. Solve dy/dx = f(x,y),y(x0)=y0 by R-K Method

THIRD SEMESTER

COMMUNICATION SKILLS - I

Unit - I

i) Communication – Purpose, Need, Importance, Types
ii) Role of communication skills
iii) Role of context and content

Unit - II

Written communication

i) Mechanics of writing – Research, Organization Pattern and Planning
ii) Logical sequencing of ideas and sentences
iii) Length of sentence and choice of words
iv) Using charts, Tables and Graphs

Unit - III

Editing – Omission of repetition, need for Brevity and substituting simple words for complex ideas, avoidance, of unfamiliar words

Unit - IV

Spoken communication

i) Role of speaker and audience
ii) Style – Choice of words, accent
iii) Tone, intonation – stress and Resonance
iv) Body language and voice modulations

Unit - V

Presentation Skills and Delivery

(i) Effective delivery – notes and scripts
(ii) Handling stage freight
(iii) Public speaking – Tips – Language and Gestures
(iv) Jackling questions and criticism
(v) Using Audio visual aids like OHP, Slides, Computer and Charts and LCD, Projectors.

Text Book:

1.How to write and speak better – Readers Digest Editor John Ellison Kahn

Reference:

1. Communication Skills: A Practical Approach, Hema Srinivasan
2. Effective communication (11^{th} Edition)
3. Writers Guide (13^{th} Edition) : Wilna R. Ebbit & David R. Ebbit.

THIRD SEMESTER

MAIN PAPER – V

DIGITAL PRINCIPLES & COMPUTER ORGANIZATION

Unit – I

Number Systems & Codes: Number System - Base Conversion - Binary Codes - Code Conversion. Digital Logic: Logic Gates - Truth Tables - Universal Gates - Boolean Algebra – Map Simplification – Combinational Circuits – Flip-flops – Sequential Circutis.

Unit – II

Digital Components Integrated Circuits – Decoders – Multiplexers – Registers – Shift Registers - Binary Counters – Memory Unit.

Unit – III

Data Representation Data types – Complements – Fixed Point representations – Floating Point representations – Other binary codes – Error Detection Codes.

Unit – IV

Register Transfer and Micro operations. Register Transfer Language – Register transfer – Bus and Memory Transfer – Arithmetic Micro Operations – Logic Micro operations – Shift Micro Operations – Arithmetic Logic Shift Unit.

Unit – V

Central Processing Unit General Register organization – Stack organization – Instruction formats – Addressing modes – Data transfer and Manipulation – Program Control – Reduced Instruction Set Computer (RISC).

Text Book

1. M.Moris Mano, Digital Logic and Computer Design, PHI, 2001.

THIRD SEMESTER

MAIN PAPER – VI

DATA BASE 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

Criteria affecting physical Organization – differences between physical and logical organization – addressing techniques – Indexed sequential organization- Hashing- Pointers- Chains and Ring structure

Unit-IV

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

Unit-V

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

Text Book

1. James Martin, "Computer Database Organization", 2nd edition- PHI, 2001
2. Kevin Loney, George Koch , "Oracle 8i The Complete Reference- 10th Edition"

THIRD SEMESTER

MAIN PAPER – VII

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 – Interfaces - Exception Handling – Multithreaded Programming - String Handling

Unit – IV

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

Unit – V

The Java I/O classes and Interfaces: File, Byte Stream, Character Stream

Text Book:

1. Herbert Schildt – Java2 (The Complete reference) – Fourth Edition – TMH, Fifth Reprint 2008
(Chapters 2,3,4,5,6,7,8,9,10,11,12,13,17,19,20,21,22)

THIRD SEMESTER

ALLIED PAPER – III

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, programmers, 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

THIRD SEMESTER

PRACTICAL - V

DBMS LAB

Use the concepts of data normalization, link between tables by means of foreign keys and other relevant database concepts for the following applications.

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

PRACTICAL VI

JAVA 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. Color and Font

FOURTH SEMESTER

COMMUNICATION SKILLS – II

Unit – I

SPOKEN ENGLISH: Communication and Language, Phonetic symbols, Diphthongs, Consonants, Vocabulary – Synonyms, Antonyms, Homonyms, Prefixes and Suffixes Reference words, Phrasal verbs and prepositional phrases**.**

Unit – II

COMPUNICATION: E-mail, E-mail auto response, FTP**,** Unmoderated usenet newsgroup, Internet relay chat**,** Cu-see me, Maven**,** Broadcast messages, Voice Mail, Voice Recognition

Unit – III

CONVERSATIONAL ENGLISH: Conversational English**,** Group Discussion**,** Interview**,** Debate**,** Meeting**,** Dialogue Writing

Unit - IV

WRITING SKILLS: Technical Writing – the structure of organized writing – paragraph writing, coherence, cohesion (use of Discourse Markers) and punctuation, Use of titles, nonverbal devices – Layout – Revision strategies – Reading techniques.

Unit - V

LETTER WRITING: Personal/Informal letters: Letters to family members and friends Business / Formal letters: Letters thanking the recipients, announcing functions, extending invitations, congratulating associates on important occasions, letters of application (Resumes), apology and complaint, letters to the editor.

Text Book:

1. Tickoo, Champa and Sasikumar Jaya, **Writing with a Purpose,** Oxford University Press, 2002.
2. Anita and Abraham, *Practical Communication,* Shankar Printers, Chennai, 1999.

References:

1.Green, David, **Contemporary English Grammar Structures and Composition,** Macmillan India Limited, 2000.

2. Pillai, Radhakrishna and Rajeevan, **Written English for You,** Chennai, Emerald Publishers, 2002.

3. Tickoo and Subramanian **Functional Grammar**

4. Srinivasan, Hema, **Communication Skills – A Practical Approach**

FOURTH SEMESTER

MAIN PAPER VIII

DATA COMMUNICATION & COMPUTER NETWORKS

Unit - I:

Introduction to Data Communication. Network, Protocols & standards and standards organizations - Line Configuration - Topology - Transmission mode - Classification of Network - OSI Model - Layers of OSI Model.

Unit - II:

Parallel and Serial Transmission - DTE/DCE/such as EIA-449, EIA-530, EIA-202 and x.21 interface - Interface standards - Modems - Guided Media - Unguided Media - Performance - Types of Error - Error Detection - Error Corrections.

Unit - III:

Multiplexing - Types of Multiplexing - Multiplexing Application - Telephone system - Project 802 - Ethernet Token Bus - Token Ring - FDDI - IEEE 802.6 - SMUS - Circuit Switching - Packet Switching - Message switching - Connection Oriented and Connectionless services.

Unit - IV:

History of Analog and Digital Network - Access to ISDN - ISDN Layers - Broadband ISDN - X.25 Layers - Packet Layer Protocol - ATM ATM Topology - ATM Protocol.

Unit - V:

Repeaters - Bridges - Routers - Gateway - Routing algorithms - TCP/IP Network, Transport and Application Layers of TCP/IP - World Wide Web.

Text Book

1. Behrouz and Forouzan - Introduction to Data Communication and Networking - 2nd Edition - TMH - 2008.

Reference:

1. Jean Wairand - Communication Networks (A first Course) - Second Edition - WCB/ McGraw Hill - 2006.

FOURTH SEMESTER
MAIN PAPER IX
OPERATING SYSTEMS

Unit - I

Operating System – Introduction – Basic Concepts and Terminology – An OS Resource Manager – OS process view point – OS hierarchical and extended machine view – Memory Management: Single Contiguous Allocation – Introduction to Multiprogramming.

Unit - II

Memory Management: Relocatable Partitioned Memory Management – Paged Memory Management – Demand Memory Management – Segmented Memory Management – Segmented and Demand-Paged Memory Management – Swapping and Overlays.

Unit - III

Job and Processor scheduling: Process Control Block – Scheduling Policies – Scheduling Algorithms : In non multiprogramming environment – In multiprogramming environment.

Unit - IV

Process Synchronization: Race Conditions – Hardware solution to mutual exclusion problem, Test and set instruction – Wait and signal mechanism – semaphores, Dead Lock conditions – Prevention – Banker's Algorithm – Detection and Recovery.

Unit - V

Device Management: I/O Devices – Device Management Functions – Serial and direct access storage devices – Disk Scheduling – File Management: Functions – file organization – allocation methods.

Text Book:

1. Operating System by Stuart E Madnick and John Donovan, Tata McGraw Hill
2. Fundamentals of Operating System by Prof. R Sridhar, Dynaram Pub. – Bangalore.

FOURTH SEMESTER
MAIN PAPER X

E-COMMERCE

Unit – I

Welcome to Electronic Commerce: Electronic Commerce – Type of Electronic Commerce Solutions – Electronic Data Interchange – Major Projects in Electronic Communication – Electronic Payments – Applications.

Unit – II

Electronic Communication : Data communication – Forms of Data Communication – Data Transmission Techniques – Types of Communication Channels – Methods of Data Transmission – Transmission Modes – Introduction to FDM, TDM, ISDN and ATM – Definition of LAN, MAN and WAN – An Introduction to Network Topology – Private, Value added, Public, Circuit Switching and Packer – Switching Networks.

Unit – III

TCP/ IP and Network Security : Introduction – Architecture of TCP/IP – Applications of TCP/IP – Security in Introduction to Internet, Intranet and extranet.

Unit – IV

Technologies Of Electronic Commerce: Introduction – Electronic Data interchange – uses – Evolution of EDI – Benefits of EDI – Understanding EDI works – Introduction to EDIFACT.
EDIFACT and SOFTWARE – The PEDI Protocol – EDI and X.400 – Business Features of EDI – EDI Administration – EDI security – Security Mechanisms.

Unit – V

Reengineering For Electronic Commerce : An introduction to Enterprise Resource Planning – Evolution and characteristics of ERP – Features of ERP – Components of ERP – ERP Vendors – Business process Reengineering – The future of ERP System - Information Technology plan for ERP System.

Text Book*:*

Doing Business on the Internet E-COMMERCE, By S.Jaiswal, 1st Edition 2000, Galgotia Publications.

Reference Book*:*

Electronic Commerce, By Gary P.Schneider James T.Perry, 2nd Edition 2001, Thomson Learning.

FOURTH SEMESTER
MAIN PAPER XI
VISUAL PROGRAMMING

Unit - I

Introduction to GUI- Introduction to Visual Basic- Customizing a Form – First Steps in building the User Interface

Unit - II

Introduction to Programming: Statements in VB, Variables, Setting Properties with code, Data Types, Working with variables, Strings, Numbers, Constants, Input Boxes. Displaying Information – Controlling Program Flow.

Unit - III

Built-in functions – User Defined Functions and Procedures – Lists, Arrays, using lists and arrays with Functions and Procedures, Sorting and searching, Records, With Statement – Control Arrays – Lists and Combo Boxes, The Flex Grid Control

Unit - IV

Building Larger Projects – VB Objects and an Introduction to Object – Oriented Programming – Finishing the Interface – Tools and Techniques for Testing, Debugging and Optimization

Unit - V

Basic File Handling – File System Controls and File System Objects-Database Development using Visual Basic

Text Book:

1. Gary Cornell "Visual Basic 6 from ground up", TMH 2002. (Chapters 3,4,5,6,7,8,9,10,11,12,14,15,18,19,22)

Reference

1. Noel Jerke "Visual Basic 6 (The Complete Reference)", Tata McGraw Hill – 2006.

FOURTH SEMESTER

PRACTICAL VII

OPERATING SYSTEMS & COMPUTER NETWORKS LAB

The following concepts to be implemented in C/C++/Java.

1. Memory Allocation (Monoprogramming)
2. Memory Allocation (Multiprogramming)
3. Job Scheduling (Monoprogramming)
4. Job Scheduling(Multiprogramming)
5. Process Scheduling (Round Robin)
6. Process Synchronization
7. Information Management (Access Control Verification)
8. General File Management

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

PRACTICAL –VIII
VISUAL PROGRAMMING LAB

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

FIFTH SEMESTER

MAIN PAPER XII

WEB TECHNOLOGY

Unit - I

Introduction to Internet – Resource H/W & S/W requirement of Internet – Domain Naming System Registering our Domain Name – URL protocol server name port relative URLs – Overview of Web browser – ISDN Dialup or Leased Line Connection – Internet Service Providers – Internet Services protocols Concepts – Internet Client and Internet Server Introduction to 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 – Defining 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 – Cascading Style Sheet

Unit - IV

Introduction to VBScript – Declaration Variables – Adding Data and Time Function to Scripts – Using Mathematical operators and Functions – Using conditional statement – Creating Functions – Using Logical Connectives and operators – A Sample Page VBScript and forms to server scripts.

Unit - V

Introduction to ASP – ASP Objects - Database access with ASP pages.

Text Book:

1. Graham, “HTML 4.0 Source Book”.
2. Ackermann, “Learning to use the Internet”
3. Mary Jane Mara, “VB Scripts Source Book”
4. Complete Reference Intermet

FIFTH SEMESTER
MAIN PAPER – XIII
INFORMATION 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 -5th Edition", PHI,2009.

Reference:

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

FIFTH SEMESTER
MAIN PAPER - XIV
SOFTWARE ENGINEERING

Unit - I

Introduction to Software Engineering: Defining – 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 Organizational Structure.

Unit - II

Software Cost Estimation: Software Cost Factors, Software Cost Estimation Techniques, Staffing Level Estimation, Estimation Software Maintenance Costs.

Unit - III

Software Requirements Definition: The Software requirements specification, Formal specification Techniques, Language and Processors for requirements specification.

Unit - IV

Software Design: Fundamental Design Concepts, Models and Modularization criteria, Design Notations, Design Techniques, Detailed design considerations, Real-time and Distributed System Design, Test Plan, Milestones, walkthroughs and Inspection, Design Guidelines.

Unit - V

Implementation Issues: Structured Coding Techniques, Coding Style, Standards and Guidelines, Documentation Guidelines.

Test Book:

1. Software Engineering Concepts By Richard Fairley, McGraw Hill Pub.

Reference:

1. Software Engineering By R S Pressman, McGraw Hill 7th Edition

FIFTH SEMESTER

MAIN PAPER - XV

MULTIMEDIA TECHNOLOGY

Unit - I

Multimedia – Definition: CDROM and the Multimedia High Way, Where to use Multimedia – Introduction to Making Multimedia – Multimedia Skills

Unit - II

Multimedia Hardware and Software: Macintosh and Windows production Platform, Basic Software Tools: Making Instant Multimedia – Multimedia Authoring Tools.

Unit - III

Multimedia Building Blocks: Text – Sound – Images – Animation – Video

Unit - IV

Multimedia and Internet: The Internet and How it Works – Tools for the World Wide Web – Designing the World Wide Web

Unit - V

Assembling and Delivering the Project: Planning and Costing – Designing and Producing – Content and Talent – Delivering

Text Book:

1. Tay Vaughan, "Multimedia – Making it with", 5th Edition, Tata McGraw Hill, 2001.

FIFTH SEMESTER
PRACTICAL IX
WEB TECHNOLOGY LAB

1. HTML

1. Usage of simple HTML commands.
2. Usage of Graphics and image formats and hyperlinks.
3. Usage of Tables, Forms
4. Usage of Frames
5. Usage of Background Graphics and Sound.

2. VBScript

6. Simple animation
7. Dynamic style sheet
8. Cascading style sheet.
9. Pay roll processing.

3. **Project**

10. Web page for an Organization

FIFTH SEMESTER
PRACTICAL –X
MULTIMEDIA TECHNOLOGY LAB

1. Text editing
2. Text Rendering
3. 2D and 3D Animation
4. Mixing and Editing Sound Files(Wave, mp3, mid, rmid)
5. Creating Ad banners using Flash
6. Image Morphing
7. Designing Logo using Macromedia
8. Designing of a Portal for the College
9. Project Work – A Comprehensive project on any particular topic that is to be presented as a Multimedia presentation
10. Project Work – Creating a comprehensive help file on any particular topic that is to be presented as a Multimedia Presentation.

SIXTH SEMESTER

MAIN PAPER – XVI

SOFTWARE TESTING

Unit - I

Introduction: What is software testing and why it is so hard?, Error, Fault, Failure, Incident, Test Cases, Testing Process, Limitations of Testing, No absolute proof of correctness, Overview of Graph Theory.

Unit - II

Functional Testing: Boundary Value Analysis, Equivalence Class Testing, Decision Table Based Testing, Cause Effect Graphing Technique. Structural Testing: Path testing, DD-Paths, Cyclomatic Complexity, Graph Metrics, Data Flow Testing, Mutation testing.

Unit - III

Reducing the number of test cases: Prioritization guidelines, Priority category, Scheme, Risk Analysis, Regression Testing, Slice based testing.

Unit - IV

Testing Activitie**s:** Unit Testing, Levels of Testing, Integration Testing, System Testing, Debugging, Domain Testing.

Unit - V

Object Oriented Testing: Issues in Object Oriented Testing, Class Testing, GUI Testing, Object Oriented Integration and System Testing. Testing Tools: Static Testing Tools, Dynamic Testing Tools, Characteristics of Modern Tools..

Text Books:

1 William Perry, "Effective Methods for Software Testing", John Wiley & Sons, New York, 3rd Edition, 2006.
2. Louise Tamres, "Software Testing", Pearson Education Asia, 2002
3. Robert V. Binder, "Testing Object-Oriented Systems-Models, Patterns and Tools", Addison Wesley, 2005.

References:

1. Cem Kaner, Jack Falk, Nguyen Quoc, "Testing Computer Software", Second Edition, Van Nostrand Reinhold, New York, 1999.
2. K.K. Aggarwal & Yogesh Singh, "Software Engineering", 7th Ed., New Age International Publishers, New Delhi, 2005
3. Boris Beizer, "Software Testing Techniques", Second Edition, Wiley-Dreamtech India, New Delhi, 2003

SIXTH SEMESTER
MAIN PAPER – XVII
MOBILE COMPUTING

Unit - I

Introducing the Mobile Internet: The Mobile Internet is here, The Rise of Mobile data. Key Services for the mobile Internet, Business opportunities.

Unit - II

WAP: the Mobile Internet Standard: Making the Internet Mobile: Challenges and Pitfalls, Overview of the Wireless Application Protocol

Unit - III

Implementing WAP Services: The Wireless Markup Language, Enhanced WML: WML Script and WTAI, User Interface Design: Marking Wireless Applications Easy to Use.

Unit - IV

Advanced WAP: Tailoring Content to the Client, Push Messaging, Wireless Telephony Applications, Building and Deploying End-to-End WAP Services.

Unit - V

The Mobile Internet Future

Text Book:

1.Sandeep Singhal, "The Wireless Application Protocol, Writing Applications for Mobile Internet", Pearson Education, 2001

SIXTH SEMESTER
PRACTICAL –XI
SOFTWARE TESTING CASE TOOLS LAB

1. **Study of testing tools**.- Tool support for testing

   Test tool classification, Tool support for management of testing and tests, Tool support for static testing, Tool support for test specification, Tool support for test execution and logging, Tool support for performance and monitoring, Tool support for specific application areas.

2**. Testing Tools – Case study and Practice**
   WinRunner, QARun, Silk Test
3.Test case design for functional testing.
4. Test case design for loop testing.
5. Test case design for synchronization.
6. Test case design in batch mode
7. Testing of GUI Application.
8. Testing of object oriented application.
9. Testing with Data Driver Wizard

ELECTIVE -I

NETWORK PROGRAMMING

Unit I

Introduction to Socket Programming – Overview of TCP/IP Protocols –Introduction to Sockets – Socket address Structures – Byte ordering functions – address conversion functions – Elementary TCP Sockets – socket, connect, bind, listen, accept, read, write, close functions – Iterative Server – Concurrent Server.

Unit II

TCP Echo Server – TCP Echo Client – POSIX Signal handling – Server with multiple clients – boundary conditions: Server process Crashes, Server host Crashes, Server Crashes and reboots, Server Shutdown – I/O multiplexing – I/O Models – select function – shutdown function – TCP echo Server (with multiplexing) – poll function – TCP echo Client (with Multiplexing)

Unit III

Socket options – get socket and set socket functions – generic socket options – IP socket options – ICMP socket options – TCP socket options – Elementary UDP sockets – UDP echo Server – UDP echo Client – Multiplexing TCP and UDP sockets – Domain name system – gethostbyname function – Ipv6 support in DNS – gethostbyadr function – getservbyname and getservbyport functions.

Unit IV

Ipv4 and Ipv6 interoperability – threaded servers – thread creation and termination – TCP echo server using threads – Mutexes – condition variables – raw sockets – raw socket creation – raw socket output – raw socket input – ping program – trace route program.

Unit V

SNMP network management concepts – SNMP management information – standard MIB's – SNMPv1 protocol and Practical issues – introduction to RMON, SNMPv2 and SNMPv3.

TEXT BOOKS

1. W. Richard Stevens, "UNIX NETWORK PROGRAMMING Vol-I" Second Edition, PHI / Pearson Education, 1999. (Units – I, II, III & IV.) (Chapter – 1-10, 23, 25)
2. William Stallings, "SNMP, SNMPv2, SNMPv3 and RMON 1 and 2", Third Edition, Addison Wesley, 1999. (Unit - V) (Chapter – 4-7)

REFERENCE

1. D.E. Comer, "Internetworking with TCP/IP Vol- III", (BSD Sockets Version), 5th Edition, PHI, 2006.

ELECTIVE -II
TCP/IP

Unit I

Introduction to TCP/IP - The OSI Model and TCP/IP Protocol Suites - Underlying Technologies

Unit II

IP Addressing - Sub netting and Super netting - Delivery and Routing of IP Packets -Internet Protocol (IP) - ARP and RARP

Unit III

Internet Control Message Protocol (ICMP) - Internet Group Management Protocol (IGMP) - User Datagram Protocol (UDP) -Transmitting Control Protocol (TCP)

Unit IV

Routing Protocols (RIP, OSPF and BGP) - Application Layer and Client-Server Model - BooTP and DHCP - Domain Name System (DNS) - Talent and Rlogin

Unit V

File Transfer Protocol (FTP) - Trivial File Transfer Protocol (SMTP) - Simple Network -Management Protocol (SNMP)- Hyper Text Transfer Protocol (HTTP)

Text Book

1. Forouzan BA -TCP/IP Protocol Suite 2nd Edition, TMH (2002) Chapters 1 to 22

ELECTIVE - III
CRYPTOGRAPHY

Unit – I

Overview - Symmetric Ciphers - Classical Encryption Techniques

Unit - II

Block Ciphers And The Data Encryption Standard - Introduction To Finite Fields - Advanced Encryption Standard

Unit - III

More On Symmetric Ciphers - Confidentiality Using Symmetric Encryption

Unit - IV

Public-Key Encryption And Hash Functions - Introduction To Number Theory - Public-Key Cryptography And Rsa

Unit-V

Key Management; Other Public-Key Cryptosystems - Message Authentication And Hash Functions

Text Book:

1. William Stallings, "Cryptography and Network Security", 4th Edition, PHI, 2006

ELECTIVE -IV

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", 2nd Edition, 1994.

Reference

1. Robert Orfali, Dan Harkey and Jerri Edwards, "Essentials of client/server computing", 3rd Edition, 1999.

ELECTIVE-V

DATA WAREHOUSING AND MINING

Unit - I

Introduction: Definitions – Taxonomy of data mining tasks - Steps in data mining process –Overview of data mining techniques.

Unit - II

Predictive modeling: Predictive modelling – Classification – Decision trees – Patterns – Association rules – Algorithms

Unit - III

Other approaches: Visualization – Statistical perspective – Clustering – Regression analysis – Time series analysis – Bayesian learning – Inductive logic programming.

Unit - IV

Data warehousing: Design – Dimensional modelling – meta data – Performance issues and indexing – VLDB issues – Development life cycle – Merits.

Unit - V

Applications**:** Tools – Applications.

Text Book:

1. Jiawei Han, Micheline Kamber, Data Mining : Concepts and Techniques, Motgan Kaufmann Publishers, 2006 2nd Editon.
2. Usama M.Fayyad, Gregory Piatetsky – Shapiro, Padhrai Smyth and Ramasamy Uthurusamy, Advances in knowledge discover and data mining, The M.I.T. press, 2004.
3. Ralph Kimball, The data warehouse life cycle toolkit, John Wiley & sons Inc., 2008.
4. Sean Kelly, Data warehousing in action, John wiley & sons, 2007.
5. Alex Berson, Stephen Smith, Kurt Thearling, Building Data mining Applications for CRM, Tata McGraw Hill, 2000.
6. Sam Anahory, Dennis Murrary, Data warehousing in the real world, Addition Wesley, 1997.

ELECTIVE-VI
BIOMETRICS

Unit–I

Introduction to biometrics – Fingerprint verification – Face recognition.

Unit-II

Hand geometry based verification - Recognizing persons by their Iris pattern – Retina identification.

Unit-III

Automatic online signature verification- Speaker recognition - Infrared identification of faces and body parts – Keystroke dynamics based authentication.

Unit-IV

Automatic gait recognition – Objective odour measurements - Ear biometrics – DNA based identification.

Unit-V

Large scale systems – Multimodal biometrics – Smartcard based authentication.

Text Book:

1. Anil Jain, Ruud Bolle, Sharath Pankanti, *Biometrics – Personal Identification in Networked Society*, Kluwer Academic Publishers, 1999, ISBN: 0-7923-8345-1 (Chapters 1-16, 18).

Reference:

1. Samir Nanavati, Micheal Thieme, Raj Nanavati, *Biometrics – Identity Verification in a Networked World*, Wiley, 2002, ISBN: 81- 265- 0273 – 8.

ELECTIVE-VII

INTRODUCTION TO BIOINFORMATICS

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

Multiple 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.

ELECTIVE-VIII

HUMAN COMPUTER INTERFACE

Unit - I

Introduction: Importance of user Interface – definition, importance of good design. Benefits of good design. A brief history of Screen design,

Unit - II

The graphical user interface – popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface.

Unit - III

Design process – Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions.

Unit - IV

Screen Designing:- Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics – Technological consideration in interface design.

Unit - V

Windows – New and Navigation schemes selection of window, selection of devices based and screen based controls.

Text Book:

1. The essential guide to user interface design, Wilbert O Galitz, Wiley DreamTech. 2. 2.
2. Designing the user interface. 3rd Edition Ben Shneidermann , Pearson Education Asia, 2008.

Reference Book:

1. Human – Computer Interaction. Alan Dix, Janet Fincay, Gre Goryd, Abowd, Russell Bealg, Pearson Education
2. Interaction Design Prece, Rogers, Sharps. Wiley Dreamtech,
3. User Interface Design, Soren Lauesen , Pearson Education.

ELECTIVE-IX

SOFTWARE QUALITY MANAGEMENT

Unit I

Software Quality: views of quality - hierarchical modeling - Boehmn and Mccalls models - quality criteria – interrelation -measuring quality - quality metrics - overall measure of quality.

Unit II

Developments in measuring quality: Gilb approach-quality prompts- Management of quality - tools for quality-quality standards.

Unit III

Quality Management System: Historical perspective elements of QMS - Human factors - Time management - QMS for software-quality assurance - ISO9000 series-a generic quality management standard.

Unit IV

Principles and Practices in QMS: Process-product-project-people in software development-management spectrum -W5HH principle - critical practices - ISO 9001 and capability maturity models.

Unit V

Measures and metrics in Process and Project domains: Metrics for software quality - Integrating metrics within Software engineering process - Metrics for small organizations.

Text Books

1. Alcon Gillies: “Software quality: Theory and management”, International Thomson, Computer press 1997; Chapters: 1,2,3,5,6,7.
2. Stephen H.Kan, “Metrics and models in software quality Engg”, Addision – Wesley1955; Chapter: 4
3. Roger S. Pressman, “Software Engineering-A Practitioner’s Approach”, 5th Edition, McGraw Hill pub.2001; Chapter: 4.
4. Humphrey Watts, “Managing the Software process” Addison Wesley, 1986.

ELECTIVE-X

MIDDLEWARE TECHNOLOGIES

Unit I

Client – Server – File Server, Database server, Group server, Object server, Web server .Middleware – General middleware – Service specific middleware. Client / Server Building blocks – RPC – Messaging – Peer – to- Peer.

Unit II

EJB – EJB Architecture – Overview of EJB software architecture – View of EJB – Conversation – Building and Deploying EJBs – Roles in EJB.

Unit III

EJB Session Beans – EJB entity beans – EJB clients – EJB Deployment – Building an application with EJB.

Unit IV

CORBA – Distributed Systems – Purpose – Exploring CORBA alternatives – Architecture overview – CORBA and networking model – CORBA object model – IDL – ORB – Building an application with CORBA.

Unit V

COM – Data types – Interfaces – Proxy and Stub – Marshalling – Implementing Server / Client – Interface Pointers – Object Creation, Invocation , Destruction – Comparison COM and CORBA – Introduction to .NET – Overview of .NET architecture – Marshalling – Remoting.

Text Book:

1. Robert Orfali, Dan Harkey and Jeri Edwards, "The Essential Client/Server Survival Guide", Galgotia Publications Pvt. Ltd., 2002. (Unit 1)

2. Tom Valesky,"Enterprise Java Beans",Pearson Education, 2002.(Unit 2 & 3)

3. Jason Pritchard,"COM and CORBA side by side", Addison Wesley,2000 (Unit 4 & 5)

4. Jesse Liberty, "Programming C#", 2nd Edition, O'Reilly Press, 2002. (Unit 5)

Reference:

1. Mowbray,"Inside CORBA", Pearson Education, 2002.

ELECTIVE-XI

MULTIMEDIA DATABASE

Unit-I

Introduction : An introduction to Object-oriented Databases; Multidimensional Data Structures: k-d Trees, Point Quad trees, The MX-Quad tree, R-Trees, comparison of Different Data Structures

Unit-II

Image Databases : Raw Images, Compressed Image Representations, Image Processing: Segmentation, Similarity-Based Retrieval, Alternative Image DB Paradigms, Representing Image DBs with Relations, Representing Image DBs with R-Trees, Retrieving Images By Spatial Layout, Implementations

Unit-III

Text/Document Databases : Precision and Recall, Stop Lists, Word Stems, and Frequency Tables, Latent Semantic Indexing, TV-Trees, Other Retrieval Techniques

Unit-IV

Video Databases : Organizing Content of a Single Video, Querying Content of Video Libraries, Video Segmentation, video Standards
Audio Databases : A General Model of Audio Data, Capturing Audio Content through Discrete Transformation, Indexing Audio Data
Multimedia Databases : Design and Architecture of a Multimedia Database, Organizing Multimedia Data Based on The Principle of Uniformity, Media Abstractions, Query Languages for Retrieving Multimedia Data, Indexing SMDSs with Enhanced Inverted Indices, Query Relaxation/Expansion

Unit-V

Creating Distributed Multimedia Presentations : Objects in Multimedia Presentations, Specifying Multimedia Documents with Temporal Constraints, Efficient Solution of Temporal Presentation Constraints, Spatial Constraints.
Spatial Concepts and Data Models: Models of spatial information, Design extending the ER model with spatial concepts, Extending the ER model pictograms, Object oriented data model with UML.

TEXT BOOKS :
1. Principles of Multimedia Database Systems, V.S. Subrahmanian, Elseveir(Morgan Kauffman).
2. Spatial Databases, Shashi Shekhar, Sanjiv Chawla, Pearson Education.

REFERENCES :
1. Multimedia Databases: An object relational approach, Lynne Dunckley, Pearson Education.
2. Multimedia Database Systems, Prabhakaram, Springer

ELECTIVE-XII
WEB SERVICES

Unit – I

Introduction – What are web services? SOAP WSDL UDDI-Why web services are important ? - The evolution of web applications Not just another distributed computing platform – Web services and enterprises.

Unit –II

XML Fundamentals: XML: The Lingua Franca of web services- XML Documents- XML namespaces Explicit and Default namespaces, Inheriting namespaces, And not inheriting namespaces, Attributes and namespaces - XML Schema XML schema and namespaces, A first schema, Implementing XML schema types, The any Element, Inheritance, Substitution groups, Global and local type declarations, Managing Schemas, Schemas and instance documents, XML schema best practices- Processing XML SAX: Simple API for XML, DOM: Document object Model, XSLT, XPATH

Unit – III

SOAP and WSDL: The SOAP Model- SOAP- SOAP Messages SOAP Envelope, SOAP Header, SOAP Body, SOAP Faults- SOAP encoding – SOAP RPC- Using alternative SOAP Encodings, Document, RPC, Literal, Encoded SOAP RPC and SOAP Document-Literal, SOAP web serices and the REST Architecture- Looking back to SOAP 1.1 Syntactic differences between SOAP 1.2 and SOAP 1.1- Changes to SOAP-RPC- SOAP Encoding- WSDL structure, The stock quote WSDL interface, definitions, The type element, bindings, services, managing WSDL descriptions, Extending WSDL – Using SOAP and WSDL

Unit – IV

UDDI: UDDI at a glance- The UDDI Business registry- UDDI under the covers – Accessing UDDI- How UDDI is playing out - Conversations: Overview – web services-web services Conversation Language – WSCL Interface components – The Bar scenario conversations – Relationship between WSCL and WSDL - Workflow: Business Process Management – Workflow and Workflow management systems – Business process execution language for web service

Unit – V

Transactions: ACID Transactions – Distributed Transactions and two phase commit – Dealing with Heuristic outcomes – Scaling transactions to web services – OASIS business transaction protocol

Text Book:

1. Developing Enterprise web services - An Architect's Guide – Sandeep Chatterjee, James Webber, Pearson Education– Second Indian Reprint 2005.

Reference Book:

1. Understanding SOA with web services , Eric Newcomer, Greg Lomow, Pearson Education, First Indian Reprint 2005.