PONDICHERRY UNIVERSITY
BACHELOR OF SCIENCE
(COMPUTER SCIENCE)
REGULATIONS
(Effective from the academic year 2009-2010)

Aim of the Course

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

Eligibility for Admission

Candidates for admission to B.Sc. in Computer science shall be required to have passed Higher Secondary Examination conducted by the Government of TamilNadu 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 / Computer Technology / Information 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
(COMPUTER OF SCIENCE)
CURRICULUM
(Effective from the academic year 2009 – 2010)

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 Computer Science	5	-	3	100
4.	Main Paper – II- Digital Electronics	4	-	3	100
5.	Allied – I – Mathematics for Computer Science	5	-	3	100
6.	Practical –I. Computer Practice Lab	-	2	3	100
7.	Practical -II. Digital Electronics Lab	-	2	3	100

SECOND SEMESTER

Sl. No.	Paper	Lecture hrs/week	Practical hrs/week	Duration of Exam	Max. Marks
1.	Language –II	6	-	3	100
2.	English-II	6	-	3	100
3.	Main Paper –III-Principles of Programming and C	5	-	3	100
4.	Main Paper – IV- Computer Organization	4	-	3	100
5.	Allied – II – Numerical Methods	5	-	3	100
6.	Practical –III- Advanced Programming in C	-	2	3	100
7.	Practical -IV.- Numerical Methods Lab (Using C)	-	2	3	100

THIRD SEMESTER

Sl. No.	Paper	Lecture hrs/week	Practical hrs/week	Duration of Exam	Max. Marks
1.	English – Communication Skills -I	5	-	3	100
2.	Main Paper –V- Data Structures	5	-	3	100
3.	Main paper –VI- Object Oriented programming	5	-	3	100
4.	Main Paper-VII- Microprocessors and Assembly language Programming	4	-	3	100
5.	Allied – III - Probability and Statistics	5	-	3	100
6.	Practical –V- Data Structure and OOPs lab	-	3	3	100
7.	Practical –VI- Microprocessors and Assembly language Programming Lab	-	3	3	100

FOURTH SEMESTER

Sl. No.	Paper	Lecture hrs/week	Practical hrs/week	Duration of Exam	Max. Marks
1.	English – Communication Skills -II	5	-	3	100
2.	Main Paper –VIII- Java programming	5	-	3	100
3.	Main paper –IX- Computer Algorithm	5	-	3	100
4.	Main Paper –X -Operating System	4	-	3	100
5.	Main Paper-XI- Data Base Management System	5	-	3	100
6.	Practical –VII- JAVA Lab	-	3	3	100
7.	Practical –VIII- RDBMS Lab	-	3	3	100

FIFTH SEMESTER

Sl. No.	Paper	Lecture hrs/week	Practical hrs/week	Duration of Exam	Max. Marks
1.	Main Paper –XII- Computer Network	5	-	3	100
2.	Main Paper –XIII – Visual Programming	4	-	3	100
3.	Main paper –XIV- Software Engineering	5	-	3	100
4.	Main Paper –XV- System Software	5	-	3	100
5.	Elective –I	5	-	3	100
6.	Practical –IX- Computer Networks Lab and OS (UNIX)Lab	-	3	3	100
7.	Practical –X-Visual Programming Lab	-	3	3	100

SIXTH SEMESTER

Sl. No.	Paper	Lecture hrs/week	Practical hrs/week	Duration of Exam	Max. Marks
1.	Main Paper –XVI- Artificial Intelligence	5	-	3	100
2.	Main Paper –XVII-Web Technology	5	-	3	100
3.	Elective –II	5	-	3	100
4.	Practical –XI-Web Technology Lab		3	3	100
5.	Project		12	Viva-Voce	100*

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

LIST OF ELECTIVES

1. Multimedia Concepts
2. Resource Management Techniques
3. Distributed Computing
4. Information Security
5. Software Testing
6. Soft Computing
7. Computer Graphics
8. Data Warehousing and Mining
9. Mobile Computing
10. Compiler Design
11. Automata Theory
12. Software Project Management

FIRST SEMESTER

MAIN PAPER - I

FUNDAMENTALS OF COMPUTER SCIENCE

UNIT I

Introduction of computers- Generations of Modern computers Classification of digital Compuer. Memory Units: RAM, ROM, PROM, EPROM, and EEPROM Auxilary Storage Devices: Magnetic storage devices-Floppy Diskettes,Hard disks,Removable Hard disks,Magnetic Tapes,Optical Storage-CD-ROM.

UNIT II

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

Programming Languages; Machine Language, Assembly Language, High Level Language, Types of High Level Language - Introduction to Software Development: Defining the Problem, Program Design, Coding, Testing, Documenting, and maintaining the program.

UNIT IV

Introduction to C- Character set,Tokens, Identifiers and keywords. Data type, Declarations, Expressions, statements and symbolic constants, Input-Output: getchar, putchar, scanf, printf, gets, puts, Pre-processor commands, #include, define, preparing and running a complete C program.

UNIT V

Operators and expressions: Arithmetic, Unary, Logical, bit-wise, assignments and conditional operator, comma operator , Library functions. Control statements: While, do, for statement, jump in loops, nested loops, if-else, switch, break, continue and goto statements.

TEXT BOOK

1.Alexis Leon and Mathews Leon, "Introduction to Computers", Leon TECHWorld, 1999.
2.E. Balagurusamy , "Programming In ANSI C", Tata McGraw Hill , 2004
REFERENCE

1.Peter Norton, "Introduction to Computers", Second edition, Tata McGraw Hill Publications 1998.
2.Byron S. Gottfried, "Programming with C" , Schaum's Outline Series, TMH ,2nd Edition 1998.

3. Kris A. Jamsa , "Programming in C " , Galgotia Publications PVT.Ltd. (1988).

4.Kernighan, B.W..,and Ritchie, D.M.., "The C Programming Language" Prentice Hall of India, 1989.

MAIN PAPER – II

DIGITAL ELECTRONICS

UNIT I
Binary systems – Boolean Algebra and Logic Gates – Simplification of Boolean Functions – Product of Sums simplification – The Map method – Two, Three, Four and Five Variable Maps – Don't Care conditions.

UNIT II
Combinational Logic: Design Procedure – adders – subtractors – code conversion – multilevel NAND circuits- multilevel NOR circuits.

UNIT III
Combinational Logic: With MSI and LSI: Binary parallel adder – decimal adder – magnitude comparator – decoders – multiplexers – ROM - Programmable logic array.

UNIT IV
Sequential logic: Flip flops – Types – Trigerring of Flip flops – Master Slave flip flop – Edge triggered flip flop – Analysis of clocked sequential circuits – state reduction and assignment.

UNIT V
Design of sequential circuits : Flip flop excitation table – design procedure – design with unused state – design of counters – design of BCD counters – design with state equation.

TEXT BOOK

1.M. Morris Mano, "Digital Logic and Computer Design ",Prentice – Hall India Private Limited. 29th reprint, August 2002.   (Chapters 1 to 7)

REFERENCE

1.Albert Paul Malvino & Donald P. Leach "Digital Principle & Applications",Mc-Graw Hill International editions, 5th edition.

2. Roger L. Tokheim, " Digital Principles", Mc-Graw hill International editions. 2nd edition.

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, 1997. (Unit –4, 5)
3. Trembly & Manohar, "Discrete Mathematics for Computer Science", TMH, 1997 (Units – 2, 3).

FIRST SEMESTER

PRACTICAL – I

COMPUTER PRACTICE 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

MS - 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

Introdcution to C- PROGRAMMING

22. Check for Biggest Number ,Prime Number, Armstrong number,
23. Fibonacci Series
24. Summation of the series: Sin (x) , Cos(x), Exp(x)

FIRST SEMESTER
PRACTICAL- II
DIGITAL ELECTRONICS LAB

1. Study of the logic gates
    - i)   AND
    - ii)   OR
    - iii)   Inverter
    - iv)   Buffer

2. Study of the logic gates
    - i)   NAND
    - ii)   NOR
    - iii)   XOR
    - iv)   EXCLUSIVE – NOR

3. Simplification of Boolean functions XY+X'Z + YZ

4. Simplification of Boolean functions $F = X'YX + X'YZ' + XY'Z' + xy'z$

5. Design the HALF-ADDER.

6. Design the HALF-SUBTRACTOR

7. Design the FULL-ADDER circuit.

8. Design the FULL-SUBTRACTOR circuit.

9. Design the Decoder.

10. Design the Multiplexer.

SECOND SEMESTER

MAIN PAPER – III

PRINCIPLES OF PROGRAMMING AND C

UNIT I

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

UNIT II

Arrays: Defining and processing.   One dimensional arrays- Two dimensional arrays. Initializing One and Two dimensional arrays- Multi dimensional arrays. Character Arrays and Strings- Introduction. Declaring   and initializing String variables – Comparison of Two Strings –String -handling functions, Table of Strings

UNIT III

Functions: Defining and accessing: Passing arguments, Function prototypes, Function calls- Categories of functions- Nesting of functions- Recursion. Use of library functions, Scope , Visibility and Lifetime of variables.

UNIT IV

Structure: Defining and processing. Structure initialization – Operations on individual members—Arrays of structures – Arrays within Structures– Structures and Functions- Passing to a function, Union.

UNIT V

Pointers: Declarations and initialization of pointer variables ,Accessing pointer variables, Passing to a function. Operations on pointers, pointer and arrays. Array of pointers, Pointer to Functions. Data Files: Open, close, create, process unformatted data files.

TEXT BOOK

1.E.Balagurusamy, "Programming in ANSC C", Tata McGraw Hill, 2004
2. Byron S. Gottfried, "Programming with C" , Schaum's Outline Series, TMH ,2nd Edition 1998.

REFERENCE

1. Kris A. Jamsa , "Programming in C " , Galgotia Publications PVT.Ltd. (1988)
2. Kernighan, B.W..,and Ritchie, D.M.., "The C Programming Language" Prentice Hall of India, 1989.

SECOND SEMESTER

MAIN PAPER – IV

COMPUTER ORGANIZATION

UNIT I

Sequential Logic: Design of shift registers – design of ripple counters with examples – Design of synchronous counter with examples – timing sequences.

UNIT II

Register transfer logic – Inter register transfer – Arithmetic, Logic and shift micro – operations – Conditional control statements – fixed point binary data – overflow – Arithmetic shifts – Instruction codes – Design of simple computer.

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 Shifter – Processor Unit – Design of Accumulator.

UNIT IV

Control Logic Design – Control Organization – Hard Wired Control with example – Microprogram Control – Control of Processor Unit – PLA Control with example – Microprogram Sequencer.

UNIT V

Instructions: Basic sets of instruction – Addressing modes – STACK – Subroutines and Interrupts. Memory Organization: RAM and ROM chips – RAM, ROM types – Memory Address Map – Memory Connections to Microprocessor.

TEXT BOOK

1. M. Morris Mano, "Digital Logic and Computer Design", Prentice – Hall of India Pvt. Limited. 29th Reprint-2002.

REFERENCE BOOK

1. Albert Paul Malvino & Donald P. Leach "Digital Principle & Applications" Mc-Graw Hill International editions, 5th edition.

SECOND SEMESTER

ALLIED PAPER – II

NUMERCIAL 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, Horner's Method.

UNIT II

Solutions to simultaneous equations by Back substitution method – Gauss elimination method – Gauss Jordan method – Iterative method - Gauss Seidel method and Finding Inverse of a Matrix.

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, Newton's Divided Differences Interpolation formula.

UNIT IV

Numerical Differentiation – 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 – Milnes and Adams method.

TEXT BOOK

1.S.S. Sastry, "Introductory Methods of Numerical Analysis", PHI, Third Edition

2.M.K. Venkataraman, "Numerical Methods in Science and Engg" The National Publishing Company , Madras Third Edition July 1995.

3.A.Singaravelu, ".Numerical Methods for B.E., B.Tech., M.C.A" , Meenakshi Publications New Edition June 2002.

SECOND SEMESTER

PRACTICAL - III

PROGRAMMING IN C

1. Array Operations
2. 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

3. Using Functions
4. Recursion
    a. Factorial
    b. Reversing a string
    c. Fibonacci Sequence
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

SECOND SEMESTER

PRACTICAL – IV

NUMERICAL METHODS LAB USING C

1. Solve f(x) = 0 by Bi-section method.

2. Solve f(x) = 0 by Newton – Raphson method.

3. Solve n simultaneous equations with n – variables by Gauss – Seidel method

4. Construct a finite difference table.

5. Interpolate the value of y for given value of x by Lagrange's Interpolation formula.

6. Evaluate $\int_a^b f(x)\,dx$ by Simpsons $1/3^{rd}$ rule.

7. Evaluate $\int_a^b f(x)\,dx$ by Trapezoidal rule.

8. Solve dy/dx = f(x,y), $y(x_0) = y_0$ by R-K method.

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

THIRD SEMESTER

MAIN PAPER – V

DATA STRUCTURE

UNIT I
Introduction –How to create programs- How to analyze programs – Ordered lists-Sparse Matrices – Stacks- Queues.

UNIT II
A mazing problem – Evaluation of Expressions – Multiple Stack and Queues – Linked Lists – Single Linked Lists – Linked Stacks and Queues – Polynomial Addition.

UNIT III
More on Linked Lists – Double Linked Lists – Dynamic storage Management garbage collection and compaction

UNIT IV
Trees – basic terminology – Binary Trees – Binary tree representations – Binary Tree traversal – Threaded Binary Trees – Applications of Trees.

UNIT V
Graphs – Terminology and Representations- Traversals- Shortest path- Connected Components – Networking Activity - Critical Paths.

TEXT BOOK

1. Ellis Horowitz and Sartaj Sahni , " Fundamentals of Data Structures ", Galgotia Book Source – New Delhi.

REFERENCE

1. Bhagat Singh And Thomas L.Nayos , "Introduction to Data Structure" ,Galgotia Book Source

MAIN PAPER – VI

OBJECT ORIENTED PROGRAMMING

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

UNIT II
Structures, enumerated data types. Function: 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, destructors, object as function arguments, returning object from function. Arrays: Arrays fundamentals, Array a Class member data, Array of objects, Strings. Operator overloading: unary operator, overloading binary operators, Data 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, pointers 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 with multiple objects, file pointer, disk I/O with member functions.

TEXT BOOK

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

REFERENCE

1. Stephen Parta , " C++ Primer Plus " , Galgotia Pub.
2. E.Balagurusamy , Object Oriented Programming with C++"

THIRD SEMESTER

MAIN PAPER – VII

MICROPROCESSOR and ASSEMBLY LANGUAGE PROGRAMMING

UNIT I

Organization of Microcomputer - What is microprocessor – Introduction to microprocessor families up to date – Buffer – Decoder – Encoder – Latch – examples of latches – Tri-state Devices – Internal architecture of 8085 Microprocessor – functions of various block and signals – demultiplexing address and data bus – generating control signals. Brief Introduction to the architecture of Z80 – Comparison of Z80 and 8085 – Introduction of Intel 8086/8088 Microprocessor (H/W & S/W components only).

UNIT II

Detailed study of 8085 – addressing modes, Instructions, classifications and format, Types of instructions – arithmetic, logical, data transfer, branch, stack, I/O and machine control instructions – subroutines – Instructions and Operation stat us – Instruction Cycles – machine cycle – T-state – fetch & execute cycles.

UNIT III

Assembly Language Programming in 8085 – data transfer operations in blocks (move, exchange, copy) – arithmetic operations – evaluation of simple arithmetic expression – Sorting of unsigned numbers – Logical operation – Code conversion – handling subroutines, writing program in Assembler.

UNIT IV

Interfacing Memory and I/O devices – address space partitioning – Memory interfacing – Memory mapped I/O and I/O mapped I/O – Parallel I/O interfacing basic concepts – PPI.

UNIT V

Methods of data transfer – Programmed data transfer schemes namely synchronous, asynchronous and interrupt driven methods – 8085 interrupts – hardware and software interrupts – enabling, disabling and masking of interrupts – DMA method of data transfer, Software Controlled asynchronous I/O using SID and SOD lines. Applications of microprocessor – A temperature monitoring System.

TEXT BOOK

1. Ramesh S. Gaonkar , Microprocessor architecture, Programming and Application " ,Wiley Eastern Limited, 1985.
2. A.P. Mathus , " Introduction to Microprocessor " , Tata McGraw Hill Publishing co, 3rd edition.

THIRD SEMESTER

ALLIED – III

PROBABILITY AND STATISTICS

UNIT I

Introduction – Motivation – Probability Models Sample Space Events – Algebra of Events – Graphical methods of representing events using the graph – Probability Axioms – Combinational Problems – Conditional Probability – Independence of Events - Baye's rule – Bernoulli trials.

UNIT II

Discrete Random variable: Introduction – Random variables and their event spaces – The probability Mass function. Distribution functions – Special discrete distributions: The Bernoulli PMF. Bernoulli – Poisson, continuous random variable – normal distribution.

UNIT III

Expectation – Introduction – Moments – Expectation of functions of more and than one random variable.

UNIT IV

Test of Hypothesis: Introduction – Procedure of testing hypothesis – Type 1 & Type 2 Errors – Standard errors & Sampling distribution – Test for significance for large samples

UNIT V

Test of significance for sample's – Students T distributions – Test the Significant of the mean of random sample – Tests for difference between the mean's of two samples [Independence samples – Dependent samples] F.

TEXT BOOK

1. S. P. Gupta, "Statistical Methods", S. Chand and Sons.
2. S. C Gupta and V. K. Kapoor, "Fundamentals of Mathematical Statistics", 11th Edition, S. Chand and Sons.

THIRD SEMESTER

PRACTICAL - V

DATA STRUCTURE and OOPS LAB

DATA STRUCTURES

1. Stacks, Queues using arrays
2. Linked List: Insertion and Deletion
3. Polynomial addition using linked list and Arrays
4. Stack and Queue using Linked List
5. Doubly linked List: Insertion and Deletion
6. Binary tree Traversal [inorder, preorder, postorder]
7. Graph Traversal [breadth first, depth first]

OOPS LAB
1. Simple functions & Inline functions
2. Function overloading & Operator Overloading
3. Usage of classes and Objects
4. Constructors and Destructors
5. Inheritance & Multiple Inheritance
6. Pointers
7. Virtual Functions, Friend functions, this pointer and Static functions
8. Files

THIRD SEMESTER

PRACTICAL – VI

MICROPROCESSOR AND ASSEMBLY LANGUAGE PROGRAMMING

1. Addition and Subtraction

2. Multiplication and Division

3. Sorting

4. Evaluation of expression

5. Block operations

6. Code Conversion

7. Applications

FOURTH SEMESTER

ENGLISH – COMMUNICATION SKILLS - 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

UNI T 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.,)

TEXTBOOKS

1.Communication Skills: A Practical Approach, Hema Srinivasan
2.Market Reports: Lorenzo
3.The Business Guide to Effective Writing: Fletcher & Gowing, Newlight Publications, New Delhi.
4.Writers Guide (6th edition) : Wilna R. Ebbit & David R. Ebbit.
5. Effective communication (7th Edition)
6.Business Correspondence: Lorenzo
7. Commercial Correspondence: M. Majumdar

FOURTH SEMESTER

MAIN PAPER - VIII

JAVA PROGRAMMING

UNIT I
Basic concepts of Oops : objects and classes, Abstraction , encapsulation , Inheritance ,polymorphism-constructor- and destructors.

UNIT II
Introduction to JAVA : JAVA features, Java program structure – Java tokens – Java Literals –Java Datatypes-Type Casting Operators –Arrays, Multi Dimensional array –Control statements.

UNIT III
Classes-Objects-Methods-method Overloading –Array of Objects .
Inheritance: Types-Method Overriding , Abstract classes-Interfaces , packages

UNIT IV
Overviews of Applets : Applet basics – Applets life cycle-creating an executable Applet in Html file AWT : working with graphics – working with frame window- Using Awt Controls : label – Buttons – Checkbox- Check Box Groups- Choice control.-text field-Multi Threading - Creating Thread – Extending Threads .

UNIT V
Event handling : Event classes – Event Listener Interfaces-handling Mouse Events- Exception handling : Fundamental –using try and catch –throw-finally statements. I/O basics: Input Stream – Output stream-file input stream – file output stream –data input stream –data output stream.

TEXT BOOK

Herbert Schildt - JAVA 2 (The Complete Reference)- Fourth Edition – TMH ,Fifth Reprint 2002, BPB Publications.

REFERENCE

1. E.Balagurusamy , "Programming with Java", 2 nd Edition , Tata Mc.Graw-Hill publishing company Ltd .

2. C.Xavier , "Programming with Java2 ",Scitech Publications Ltd.

FOURTH SEMESTER

MAIN PAPER – IX

COMPUTER ALGORITHM

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

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

REFERENCE

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

FOURTH SEMESTER

MAIN PAPER - X

OPERATING SYSTEM

UNIT I
Operating System – Introduction – Basic Concept and Terminology - An OS Resource Manager – OS process view point – OS hierarchical and extended machine view – Memory management: Single Contiguous memory allocation – Introduction to multiprogramming.

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
Job and Processor scheduling: Process control block – scheduling policies – scheduling algorithms: In non multiprogramming environment – In multiprogramming environment.

UNIT V
Process Synchronization: Race Condition – Hardware solution to mutual exclusion problem: Test and Set instruction – Wait and Signal mechanism – semaphores. Deadlock: 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. Stuart E. Madnick and john Donovan , " Operating System ", Tata McGraw – Hill

2. Prof. R. Sriddhar , "Fundamentals of Operating System" , Dynaram Publication , Bangalore Company

FOURTH SEMESTER

MAIN PAPER – XI

DATA BASE MANAGEMENT SYSTEMS

UNIT I

Introduction – Basic Terminology – Data Base definition – Objectives of Data Base Organization – File System versus Database System – Entities and Attributes – Schemes and Sub-schemes – Data Base Management System – DBMS Architecture.

UNIT II

Data Models – Tree Structures – Plex Structure – Relational Data Base – Third Normal Form – Canonical Data Structures – Data Independence – Enhanced E.R. Modeling.

UNIT III

SQL Statements: Data Retrieval: SELECT, Data Definition Languages: CREATE, ALTER, DROP, RENAME, TRUNCATE, Data Manipulation Language : INSERT – UPDATE, DELETE –MERGE. Transactional Control: COMMIT, ROLLBACK, SAVEPOINT, Data Control Language: GRANT, REVOKE – SELECT ORDER BY – SELECT GROUP BY – Searches Involving Multiple Tables – Natural Join – Outer Join – Creating and Manipulating Views.

UNIT IV

Difference between the Physical and Logical Organization – Addressing Techniques – Hashing – Indexed searching techniques, chains and Rings structures.

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 Data base Organization ", Second Edition – Prentice – Hall
2. Henry F. Korth Abraham Silberschatz , "Database System Concepts ", Fourth Edition – McGraw – Hill International Editions 2002

REFERENCE

1. C.J. Date, "An Introduction to Database System", seventh edition, pearson Education, New Delhi, 2002.

FOURTH SEMESTER

PRACTICAL VII

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. Colour and Font

FOURTH SEMESTER

PRACTICAL VIII

RDBMS LAB

1. Creating tables.
2. Manipulation of tables.
3. Practising all Sql Queries.
4. Creating Pl- Sql programs for any 3 applications
5. Generating reports.
6. Relating databases using keys and generating required reports such as
   Electricity bill processing
   Pay roll processing
   Personal information system
   Question database and conducting Quiz

FIFTH SEMESTER

MAIN PAPER – XII

COMPUTER NETWORK

UNIT I
Introduction – Uses of Computer Networks – Networking Hardware-Networking Software – Reference Models- OSI, TCP/IP comparison of OSI and TCP/IP Model- Network Standardization – Metric units.

UNIT II
The Physical Layer –Guided transmission media-wireless transmission – Communication satellite – public switched network –Mobile telephone system. Data Link layer- Design Issues- error detection and correction – Elementary and Link protocols – Data Link layer in the Internet.

UNIT III
The Medium Access Sub Layer – The Channel Allocation problem- Multiple access protocols –Aloha. Carrier sense multiple access protocols , Collision free protocols – IEEE 802 for LANs and MANs- wireless LANs –802.11, Data Link layer switching –Repeaters, Hubs, Bridges, switches , Routers and Gateways.

UNIT IV
The Network layer –Design issues-routing algorithms-shortest path, flooding, Flow-based routing, Hierarchical Routing – Broadcasting routing- congestion control algorithms – General principles- congestion prevention policies, Internetworking – Network layer in the Internet- IP Protocol , IP Address, internet Multicasting- Mobile IP

UNIT V
The Transport Layer – Transport Service- Elements of transport protocols – UDP , Remote procedure Call –TCP , TCP Connection management, wireless TCP and UDP. The Application Layer- Domain name system- electronic Mail- The world wide web – network security- Cryptography – Introduction to Cryptography – Substitution ciphers – Transposition ciphers – Fundamental Cryptographic principles- web security-Threats, secure naming , SSL- The secure sockets Layer.

TEXT BOOK

1. Andrew S. Tannenbaum , "Computer Networks" , Fourth Edition –EEE

REFERENCE

1. Cerd E.Keiser , "LOCAL AREA NETWORKS " , Mc.Graw.Hill.

MAIN PAPER – XIII

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 datatypes – 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"

MAIN PAPER – XIV

SOFTWARE ENGINEERING

UNIT – I

Software – Software characteristics – software applications Software Engineering – A Generic view – Software process – Software process model – The Linear sequential Model – Prototyping Model – RAD Model – Fourth Generation Techniques.

UNIT – II

Measures, Metrics and Indicators – Software metrics – Process metrics – Project metrics. Software measurement – size oriented metrics – Function oriented metrics – Measuring Quality – Metrics for small organization – Establishing a software metrics program.

UNIT – III

Software Project Planning – objectives – Feasibility – Software project Estimation – Empirical Estimation models. The structure of Estimation models – COCOMO model. Software Risks – Software Quality Assurance.

UNIT – IV

Software Testing Technique - Software Testing Fundamentals Testing objectives – Testing Principles - Testability - Test case Design – White Box Testing - Basic path testing – Control Structure Testing – Black Box Testing.

UNIT – V

Software Testing Strategies – A strategic approach to Software testing – Verification and validation – strategic issues – UNIT testing – Integration testing – Validation Testing – System testing – The Art of Debugging.

TEXT BOOK

1. Pressman. R.S. , "Software Engineering " , McGraw – Hill 2nd Edition.

REFERENCE

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

MAIN PAPER – XV

SYSTEM SOFTWARE

UNIT I
Background: Machine structure – memory - register – data – instructions – special features.
Assembly languages: Address modifications – Using instruction – Using index register – looping – simple assembly language programs.

UNIT II
Assemblers: Purpose – pass 1 and pass 2 of assembly with flow chart – symbol table – literal table – base table generation.

UNIT III
Macros: Concept – definition – macro call – macro call with arguments – conditional macros – nested macros.

Macro processor: Definition – generation of macro definition table – macro name table – argument list array – two pass-macro processors – simple two-pass algorithms.

UNIT IV
Loaders: concept – General loader scheme – four functions of a loader – allocation – relocation – linking and loading as accomplished by absolute – relocating and direct – linking loader.

UNIT V
Features of High level languages: PL/1 – language – data types and structure – storage allocation and scope of names – accessing flexibility - functional modularity – asynchronous operation.

Compiler: Definition – lexical analysis – syntax analysis interpretation – parse tree – storage allocation – code generation – optimization – structure of compiler.

TEXT BOOK

1. John J. Donavan ," System programming " .
2. Leland L.Beck "System Software – Introduction to system program "
3. Damdhare., "Introduction to system software "

FIFTH SEMESTER

PRACTICAL -IX

COMPUTER NETWORKS LAB and OS(UNIX) LAB

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

OS (UNIX) LAB

1. Practicing UNIX Commands   System Calls
2. Shell Programming
3. Inter Process Communication (Message passing)

FIFTH SEMESTER

PRACTICAL -X

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. Library information system
11. Students mark sheet processing
12. Telephone directory maintenance
13. Gas booking and delivering

SIXTH SEMESTER

MAIN PAPER –XVI

ARTIFICAL INTELLIGENCE

UNIT I

What is Artificial Intelligence – A definition – Underlying Assumption – A.I. Technique – space search – Production systems – Control Strategies – Heuristic search – Problem characteristics – Production system characteristics.

UNIT II

Basic problem solving methods – Forward Versus backward reasoning – Problem trees versus problem graphs – Heuristic search Techniques: Generate and test – Hill climbing – Breadth First Search – Breadth First Search – Problem reduction constraint satisfaction – Means – ends analysis – Knowledge representation issues: Representation and Mapping – Approaches to Knowledge representation.

UNIT III

Predicate logic: Representing simple facts in logic – representing Instance and Is a relationship – Computable functions and Predicates – Resolution. Frames – strong slot and filler structures: Conceptual Dependency – Scripts. Advanced Problem – Solving System.

UNIT IV

Game playing – The minimax search Procedure – Adding Alpha – Beta cut offs – Planning Overview – An Example Domain: The Blocks World – Components of Planning – Nonlinear planning – Using Constraint Posting – Hierarchical Planning – Other planning Techniques – The black board approach – Delta –min communication through objects.

UNIT V

Experts Systems – Definition of Expert Systems – Characteristics of an Expert Systems – Architecture of Expert Systems – role of expert system knowledge acquisition – advantages and limitation of expert system – example expert System: MYCIN.

TEXT BOOK

1. Elaine Rich, Kevin Knight , "Artificial intelligence", Mc.Graw – Hill edition

2. S.Janakiraman, K. Sarukesi, GopalKrishnan.P, "Foundations of Artificial intelligence and expert systems", Macmillan Series.

SIXTH SEMESTER

MAIN PAPER –XV II

WEB TECHNOLOGY

UNIT I

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 of leased line connection – Internet service providers – Internet services protocols concepts, Internet client and Internet servers, 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 lists – using unordered lists – Directory list.

Definition Lists – combining List Types Graphics and image Format – Graphics and HTML Documents.

Images 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 VB Script – Declaring variables – Adding data and Time Function to scripts – Using mathematical operators and functions using conditional statements. Creating functions using logical connectives and operators, A simple page VB Script and forms. Introduction to server side 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 BOOK

1. HTML 4.0 Source Book
2. Ackermann, " Learning to use the Internet"
3. Mary jane Mara , " VB Script Source Book"
4. Scot Johnson, " Using Active Server Pages "

SIXTH SEMESTER

PRACTICAL - XI

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

SIXTH SEMESTER

ELECTIVE - 1

MULTIMEDIA CONCEPTS

UNIT I
Multimedia – Definition – Applications – Types – Specification: Hardware and Software – Authoring tools – Needs.

UNIT II
Multimedia Components Audio: Definition – MDI and digital audio – file extensions.
Text: Definition – Fonts – Titling – Hypertext – Text edition tools – File extensions.
Graphics: Colors – Graphics in multimedia. Source of Images – 3D graphics – Raster and Vector graphics – hyper graphics, Image Processing software tools – File extensions.
Animation: Object and cell animation. 2D and 3D animation techniques – software tools – File extensions.
Video: Digital video – Full motion and full screen videos – cut, copy and paste and zooming – File extensions.

UNIT III
Digital video and Image compression: Evaluating a compression system, redundancy and visibility – video compression techniques – Images compression – JPEG, M PEG, DVD, CD Family CO family – CDI-overview.

UNIT IV
Multimedia Project – Multimedia Project Design concept – Project Planning and Costing – The Multimedia Team – Delivering a Multimedia Project.

UNIT V
Multimedia in Internet – Designing for the WWW – Working on the web – Text, Images, Sound and Animation for web.
Introduction to basic HTML tags.

TEXT BOOK

1. John I.Kogel Buford ,” Multimedia System:” , Addison Wesley Press.
2. S.Gokul. , Multimedia Magic , BPB Publication.
3. Tay Vaughan ,”Multimedia: Marketing it Work.”, Tata McGraw Hill publishing company Ltd.

ELECTIVE- II

RESOURCE MANGEMENT TECHNIQUES

UNIT I
Concept and scope of operation research (OR) – Development of OR – Phases of or – Model in OR.Linear proframming : Methods of soulation –Graphical and SIMPLEX methods of solution – Standard form and pivoting, canonical form, optimal, unbounded and infeasible forms, solving linear programs in canonical forms, obtaining canonical forms from standard form, the SIMPLEX algorithm

UNIT II
Integer Programming: The Integer Programming Problem – Implicit Enumeration – Solution by Branch and Bound – 0-1 Integer Programs – Integer Programming Formulation Examples – Integer Programming Formulation Techiques.

UNIT III
LP Transportation Model: Definition and application of the transportation model, solution of the transportation model, the assignment model, the transshipment model, Travelling Salesman problems.

UNIT IV
Network Scheduling by PERT/CPM : Introduction, Network and basic components, Rules of network construction, time calculation in networks, critical path method(CPM), PERT, PERT calculations, Negative float and negative slack, advantages of PERT/CPM.

UNIT V
Sequencing models and related problems : Processing   n   Jobs through two Machines, Processing n Jobs through three Machines, Processing two Jobs through m Machines, Processing n Jobs through m Machines.

TEXT BOOK

1. Operations Research by Hamdy A.Taha (Publishers: Macmillan copyright 1989.)
2. Operations Research by Kanti Swarup, P.K. Gupta & Manmohan. S.chand & Company Ltd.
3. Introduction to Operations Research Jpseph G. Edker Michael Kupferschmid John Wiley & Sons, Inc

ELECTIVE - 3

DISTRIBUTED COMPUTING

UNIT I
Introduction –Evolution of Distributed computing system- Distributed computing System modules- Why are Distributed computing system gaining popularity -What is Distributed operating system -Issues in Designing a Distributed operating system.

UNIT II
Introduction to Distributed computing Environment (DCE)-DCE components Communication protocols-Example of message transfer in the OSI modules- Message passing-Desirable features of a good message passing system-Issues in IPC By message passing-Synchronization-Buffering

UNIT III
Synchronization-Introduction-Clock Synchronization-Issues-Algorithms –Event Ordering-Mutual Exclusion – Election Algorithms

UNIT IV
Process Management-Process Migration –Features of a Good process Migration Mechanism- Process Migration Mechanism-Freezing and Restarting a Process –-Threads-Motivations of using Threads-Models for Organizing Threads- Issues in designing a Thread package

UNIT - V
Security-Introduction - Potential attacks to computer systems- Cryptography Basic concepts and Terminology –Access control –Protection Domains –Access Matrix- Design Principles.

TEXT BOOK
1. Andrew S. Tanenbaum & Maarten van Steen, "Distributed Systems – Principles and Paradigms", Prentice-Hall India, 2002."

REFERENCE
1. Pradeep K .Sinha, " Distributed Operating System-concepts and Design "- PHI-2002.

ELECTIVE – 4

INFORMATION SECURITY

UNIT I
Introduction to Computer Security: information security and network basics; information security and its role in an organization; legal and regulatory issues; government homeland security initiatives and how they impact business and individuals

UNIT II
Threats; internal threats: employees, contractors, third parties; external threats: criminals, corporate espionage, hackers, cyber warfare, cyber terrorism; psychology of computer criminals and info-terrorists and associated ethical issues

UNIT III
Cryptography -Secret Key Cryptography -Public Key Cryptography -Key Distribution and Management

UNIT IV
OS Security -Access Control -Vulnerability Analysis -Computer Viruses and Worms

UNIT V
Network Security --TCP/IP Security -Application Level Protocol Security -Web Security -Intrusion Detection

TEXTBOOK

1. M. Bishop, "*Computer Security Art and Science*", Addison Wesley**,**

2. Michael E. Whitman and Herbert J. Mattord ,*"Principles of Information Security",* *Thomson/Course Technology*

3. Christopher King, Ertem Osmanoglu, Curtis Dalton *"Security Architecture: Design, Deployment and Operations", McGraw-Hill Osborne Media; 1st edition (July 30, 2001)*

ELECTIVE - 5

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.

REFERENCE

 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.

ELECTIVE -6

SOFT COMPUTING

UNIT I

ARTIFICIAL NEURAL NETWORKS
Basic concepts - Single layer perception – Multilayer perception – Supervised and unsupervised learning – Back propagation networks –

UNIT   II

FUZZY SYSTEMS
Fuzzy sets and Fuzzy reasoning – Fuzzy matrices – Fuzzy functions – Decomposition – Fuzzy automats and languages – Fuzzy control methods – Fuzzy decision making.

UNIT III

NEURO-FUZZY MODELING
Adaptive networks based Fuzzy interface systems – Classification and Regression Trees – Data clustering algorithms – Rule based structure identification – Neuro-Fuzzy controls – Simulated annealing

UNIT IV

GENETIC ALGORITHMS
Survival of the Fittest – Fitness computations – Cross over – Mutation – Reproduction – Rank method – Rank space method.

UNIT V

SOFTCOMPUTING AND CONVENTIONAL AI
AI search algorithm – Predicate calculus – Rules of interference – Semantic networks – Frames – Objects

REFERENCE

1. Jang J.S.R.,Sun C.T. and Mizutani E, " Neuro-Fuzzy and Soft computing ", Prentice Hall 1998
2. Timothy J.Ross, " Fuzzy Logic with Engineering Applications ", McGraw Hill,1997
3. Laurence Fausett, " Fundamentals of Neural Networks ", Prentice Hall,1994
4. George J.Klir and BoYuan, " Fuzzy sets and Fuzzy Logic ",Prentice Hall,USA 1995
5. Nih J.Nelsson, " Artificial Intelligence – A New Synthesis ",Harcourt Asia Ltd.,1998
6. D.E.Goldberg, " Genetic Algorithms: Search, Optimization and Machine Learning ",Addison Waslay N.Y.,1989

ELECTIVE-7

COMPUTER GRAPHICS

UNIT I
Introduction to computer graphics – display devices- Hardcopy devices – interactive input devices – display processors-graphic adaptors-graphics software – output primitives.

UNIT II
Two-dimensional transformations- windowing and clipping- cliping algorithms

UNIT III
Segmented display files-display file compilation-modeling and sodeling transformation.

UNIT IV
Three-dimensional concepts-three-dimensional representations-three-dimensional transformations.

UNIT V
Three-dimensional viewing-hidden surface and hidden line removal-shading and color models

TEXT BOOK

1. Computer Graphics by Donald hearn and Pauline baker, Prentice hall, New delhi,1986.

REFERENCE

1. Computer Graphics, A programming approach by Steven Harrington, McGraw hill, 1986.

ELECTIVE – 8

DATA WARE HOUSING 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

UNIT V

Applications and trends in data mining

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.

ELECTIVE – 9

MOBILE COMPUTING

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.
2. William C.Y.Lee, "Mobile Communication Design Fundamentals", John Wiley,1993.

<center>**ELECTIVE -10**</center>

<center>**COMPILER DESIGN**</center>

UNIT I

Introduction to compilers-what is a com piler-overview of the Compilation Process –Typical Compiler Structures- Implementing a compiler- Programming Language Grammar-Elements of a Formal Language Grammar-Derivation, Reduction- and Syntax Trees- Ambiguity –Regular Grammars and Regular Expressions-Important Definitions and relations concerning Grammars Scanning and parsing Techniques-The Scanner Top Down Parsing-Bottom Up Parsing –syntax Directed Translation.

UNIT II

Symbol Table Organization-Elementary symbol-Table organisation – Hash Table Organisation-Linked List and Tree Structured Symbol Tables.

UNIT III

Compilation of Expressions-Intermediate Code-Forms-Code Generation for Expressions.

UNIT IV

Compilation of control structures- Control Transfers-procedure Calls-Conditional Execution-Iteration Control Constructs.

UNIT V

Error Detection, Indication and Recovery –Code Optimization-Lexical and Syntax Errors-Semantic Errors-The Error Print Routine-Run Time Errors –Debugging Aids and options.

TEXT BOOK

1. Compiler Construction Principles and practice by D.M. Dhamdhere

REFERENCE

1. Prinicples of Complier Design Alfred V.Aho & Jeffrey D.Ullman.

ELECTIVE -11

AUTOMATA THEORY

UNIT I
Preliminaries-Strings,alphabets and languages-Graphs and trees-inductive proofs-set notation-relations-Finite Automata and Regular Expressions-Finite State systems-basic definitions Nondeterministic finite automata-finite automata with E moves-Regular expressions-automata with output-Applications of finite automata.

UNIT II
Properties of Regular Sets-The pumping lemma for regular sets-Closure properties of regular sets.

UNIT III
Context-free Grammar-Motivation and introduction-context-free grammars-Derivations trees-Simplification of context-free grammars-chomsky normal form-Greibach normal form.

UNIT IV
Pushdown Automata – Informal description-definitions-Pushdown automata and context-free languages. Properties of context-free languages-the pumping lemma for CFL's-closure properties of CFL's.

UNIT V
Turing Machines-Introduction-The turing machine model-Computable languages and functions-Techniques for Turing machine construction-Modifications of Turing machines.

TEXT BOOK

1. Introduction to Automata Theory, Languages and Computation by John E.Hopcroft and Jeffery D.Ullman

ELECTIVE-12

SOFTWARE PROJECT MANAGEMENT

UNIT I
Introduction to Project Management Importance of software project management -Project Problems with Software Projects . Project Management- Stages of Project .. The Feasibility Study - The Cost-benefit Analysis

UNIT –II
 Planning-. Project Execution--Project and Product Life Cycle-The Stakeholder of Project - All parties of project - The Role of Project Manager- Project Management Framework-Software Tools for Project Management - Project Planning

UNIT – III
Scope Management -Methods for Selecting Projects - Project Charter- Scope Statement-Work Breakdown Structure - Stepwise Project Planning-Overview - Main Steps in Project Planning - Use of Software (Microsoft Project) to Assist in Project Planning Activities Project Scheduling .

UNIT – IV
Importance of Project Schedules -. Schedules and Activities . Sequencing and Scheduling Activity Project Network Diagrams Network Planning Models Duration Estimating and Schedule Development Critical Path Analysis -Program Evaluation and Review Technique (PERT) to Assist in Project Scheduling -. Project Cost Management .

UNIT -V
 Importance and Principles of Project Cost Management - Resource Planning - Cost Estimating Types of Cost Estimates . Expert Judgment -   Quality of Information Technology Projects Risk management-The Importance of Project Risk Management Common Sources of Risk in IT projects Risk Identification   Risk Quantification Risk Response Development and Control   Using Software to Assist in Project Risk Management

TEXT BOOKS

1. Information Technology Project Management   Kathy Schwalbe, International Student Edition, THOMSON Course Technology, 2003
2. Software Project Management   Bob Hughes and Mike Cotterell, Third Edition, Tata McGraw-Hill
3. Microsoft Office Project 2003 Bible , Elaine Marmel, Wiley Publishing Inc.