

**SEMESTER - I DISCRETE MATHEMATICS - PCA701**

**UNIT-I Set Theory :** Introduction-Sets-Notations and Descriptions of Sets-Subsets-Operations on Sets-Properties of Set Operations-Verification of the Basic Laws of Algebra-Cartesian product of two sets-Relations-Representation of a Relation-Operations on Relations-Equivalence Relations-Partition and Equivalence Classes-Functions-One-to-one and Onto Functions-Special types of Functions-Invertible Functions-Composition of Functions. [18 HRS]

**Chapter 1:1 to 4, 6 to 8, Chapter 2:1 to 5, 7, Chapter 3:1 to 5,**

**UNIT-II**

Logic: Introduction-TF Statements- Connectives-Compound Statements-Truth Table of a Formula-Tautology-Tautology Implications and Equivalence of Formulae-Normal Forms-Principles of Normal Forms-Theory of Inference, simple problems . **Chapter 9:1 to 4, 6 to 8, 11 to 13** [ [18 HRS]

**UNIT-III**

Finite Automata-Definition of an Automaton- Representation of Finite Automaton-Acceptability of a string by a Finite Automaton-Languages accepted by a Finite automaton – Nondeterministic Finite automata - Acceptability of a string by Nondeterministic Finite Automata. **Chapter 12:1 to 8**[18 HRS]

**UNIT-IV**

Equivalence of FA and NFA- Procedure for finding an FA equivalent to a given NFA – Phase-structure Grammars . **Chapter 12:9,10,16**  
[18 HRS]

**UNIT-V**

Pushdown Automata-Definition of a Pushdown Automaton – Instantaneous Descriptions of a PDA- Important properties of move relation - Acceptance by PDA – Equivalence of two types of a Acceptance by PDA. **Chapter 12: 23 to 28**  
[18 HRS]

**Text Book:** Discrete Mathematics-Venkatraman M.K, Sridharan.N, Chandrasekaran.N , The National Publishing Company, Chennai, 2000.

**Reference Books:**1. Theory of Computer Science- K.L.P Mishra and N. Chandrasekaran ,Prentice Hall of India, Pvt Ltd

2. Discrete Mathematical Structures applications to Computer Science, Trembly & Manohar, Tata McGraw.
3. Introduction to Automata Theory, Languages and Computations, Hopcraft and Ullman, 2<sup>nd</sup> Edition, Pearson Education.
4. Discrete Mathematical Structures with Applications to Combinatorics, Ramaswamy V, University Press, 2006.
5. Veerarajan T, “ Discrete Mathematics with graph theory and combinatorics” , TMG, 2007,.

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**SEMESTER – I PROGRAMMING IN C - PCA702**

**Objective:** To develop programming skills using C language and to learn to use the specialties of 'C' language for programming.

**UNIT-I:** [15 Hrs]

**Introduction:** Identifiers - key words - data types access modifiers - data type conversions - operators - conditional controls - loop controls - i/o operations.

**UNIT-II:** [15 Hrs]

**Function prototyping** - function arguments - actual vs formal parameters - pointers - pointer variables - pointer concepts in functions - multiple indirection.

**UNIT-III:** [15 Hrs]

**Arrays** - accessing array elements - pointers and arrays - arrays as function arguments - function returning addresses - dynamic memory allocation - storage classes.

**UNIT-IV:** [15 Hrs]

**Structures** - unions - typeset - enema - array of structures - pointers to structures - macros and preprocessors. Character I/O - string I/O - formatting I/O - error handling during I/O - command-line arguments.

**UNIT-V:** [15 Hrs]

**Pointers** - Declarations - Passing pointers to functions - operation in pointers - pointers and arrays - Arrays of pointers - Structures and pointers – Files: Creating, processing, opening and closing - Bitwise Operations

**Text Books:**

1. Kanetkar Y. – “Let us C” – BPB Pub., - New Delhi – 1999.
2. B.S.Gottfried – “Programming with C” - Schaum’s Outline series – TMH Edition – 1997.
3. Brain W. Kernighan, Dennis M. Ritchie, “The C Programming Language”, Prentice Hall of India Pvt. Ltd., New Delhi, Second Edition, 1998.

**Reference Books:**

1. Robert A. Radcliffe - 'Encyclopedia C' - BPB Publications.
2. E. Balagurusamy – “Programming in ANSI C” – Tata McGraw Hill, Edition 2.1, 2002.

**SEMESTER – I    COMPUTER ORGANIZATION - PCA703****Objective:**

- ❖ To give the fundamental principles of digital electronics.
- ❖ To give the basic knowledge on various building blocks of a typical digital computer.

**UNIT - I:****[15 Hrs]**

**Number Systems** - Conversion from one number system to another –Complements - Binary Codes - Binary Logic - Logic gates - Truth Tables.

**UNIT - II:****[15 Hrs]**

**Boolean Algebra** – Simplification of Boolean Functions - Map Method(Upto 5 Variables) .Sequential Logic - Flip Flops – Registers - Counters

**UNIT – III:****[15 Hrs]**

**Central processing UNIT** : General register and stack organizations - Instruction formats - Addressing modes - Arithmetic, instruction and RISC pipeline - Computer Arithmetic - Addition and subtraction - Multiplication and Division Algorithms - floating point and decimal arithmetic operations.

**UNIT – IV:****[15 Hrs]**

**Input-Output organization** - peripheral devices, I/O Interfaces - Asynchronous data transfer - modes of transfer - Priority interrupt - direct memory access - I/O processor.

**UNIT – V:****[15 Hrs]**

**Memory Organization** - Memory hierarchy - main memory - Auxiliary memory - associative, cache and virtual memory .

**Text Books:**

1. M Morris Mano, “Digital Logic and Computer Design” - Prentice-Hall India.
2. M. M. Mano - “Computer System Architecture” - PHI, Third Edition.
3. J. P. Hayes – “Computer Architecture and Organization” – McGraw Hill, Third Edition.
4. Kai Hwang – “Advanced Computer Architecture”, Tata - McGraw Hill, Edition 2001.

**Reference Books:**

1. Thomas C Bartee - “Computer Architecture and logic Design” - TMH.
2. Malvino and Leech - “Digital Principles and Applications” - TMH

**SEMESTER – I OPERATING SYSTEMS - PCA704T****Objective:**

1. To enable the student to learn the operating system and the functioning.
2. To enable the student to understand the memory management, file management and I/O systems.

**UNIT – I:****[12 Hrs]**

**Introduction:** Mainframe Systems-Distributed systems- I/O structure - Hardware protection-Operating-System Calls-System Services- System programs.

**UNIT – II:****[12 Hrs]**

**Files and protection:** File concept-Access Methods-Directory Structure-Protection

**Secondary storage management** – File System structure – Allocation Methods - Free space management–Directory Implementation – Efficiency and Performance-Recovery

**UNIT – III:****[12 Hrs]**

**Process Management:** Process concept-Process Scheduling– Cooperating process- Interprocess communication.– CPU Scheduling – Scheduling Algorithms, Multiple processors Scheduling-Critical section problem-Semaphores, Classical problem of synchronization,

**Deadlocks:** Characterization, Prevention, Avoidance, and Detection.

**UNIT – IV:****[12 Hrs]**

**Storage Management:** Swapping – Contiguous Memory Allocation-Paging - Segmentation -Virtual Memory - Demand paging - Page replacement and algorithms.

**UNIT – V:****[12 Hrs]**

**Introduction to LINUX:** Shell kernel-pipes and redirection-shell as programming-shell syntax-variables-environmental variables-parameter variables-control structures-functions- Basic commands.

**Text Books:**

1. Silberschatz & Galvin & Gagne – “Operating System Concepts” – Addison – Wesley Publishing Co. (Sixth edition).
2. Achyut S. Godbole – “Operating Systems” – Tata McGraw Hill – 1999.
3. Neil Matthew, Richard Stones-“Beginning Linux Programming”-Wiley-India edition-4<sup>th</sup> edition.-2009(reprint) –Unit IV and V

**Reference Book:**

Andrew S. Tanenbaum – “Modern Operating Systems” – Prentice Hall of India Private Ltd.NewDelhi,1997

## SEMESTER – I PRINCIPLES OF PROGRAMMING - EPCA705S

### LANGUAGES

#### UNIT – I: [15 Hrs]

**Introduction:** The Study of Programming Languages – Why Study Programming Languages ? – A Short History of Programming Languages – What Makes a Good Language? – Effects of Environments on Languages. Language Design Issues: The Structure and Operation of a Computer – Virtual Computers and Binding Times – Languages Paradigms. Language Translation Issues: Programming Language Syntax – Stages in Translation – Formal Translation Models.

#### UNIT - II: [15 Hrs]

**Elementary and structured data type:** Data object variables, constants, data type, elementary data types, declaration, assignments and initialization, enumeration, characters strings.

Structured data type and objects: Specification of data structured types, vectors and arrays, records, variable size data structure, pointers and programmer constructed data structure, Set files.

Imperative Languages: Block structure, Scope rules, Parameter Passing, Construct like co-routines, Tasks etc.

#### UNIT - III: [15 Hrs]

**Object oriented languages:** The class notion- Information hiding and data abstraction using classes, derived classes and inheritance– Polymorphism – Parameterized types.

#### UNIT - IV: [15 Hrs]

**Functional languages:** Functional programming concepts – Referential transparency – Types – Type systems - Names, bindings, environment and scope – Recursive functions – Polymorphic functions – Type variables – High order functions – Curried functions – Lists and programming with lists – Definition of new user defined types in ML – Abstract data types – Evaluation methods.

#### UNIT - V: [15 Hrs]

**Logic languages:** Review of predicate logic – Clause-form logic – Logic as a programming language- Unification algorithm - Abstract interpreter for logic programs – Theory of logic programs – Applications of Logic programming - Introduction to Prolog, Data Structures in Prolog, Programming techniques, Control in Prolog

#### Text Books:

1. “Programming Languages – Design and Implementation” - by Terrence W. Pratt & Marvin V. Zelkowitz, Fourth Edition
2. “Programming Languages – Concepts & Constructs” - by Ravi Sethi, Pearson Education.

#### Reference Books :

1. “Programming Language Design Concepts”– by David A. Watt and William Findlay
2. “Fundamentals of Programming Languages” – by Ellis Horowitz – SecondEdition

**SEMESTER – I C PROGRAMMING LABORATORY - PCAP101S****Objective:**

To enable the students to learn structures, pointers and file concepts in C Programming.

1. Determining a given number is prime or not.
2. Pascal's triangle
3. String Manipulation
4. Matrix Multiplication.
5. Finding determinant of a Matrix.
6. Finding inverse of a Matrix.
7. Checking for tautologies and contradictions.
8. Euclidean's Algorithm for finding GCD.
9. Generating Permutation.
10. Computing Combinations.
11. Creating database for telephone numbers and related operations. Use file concepts.
12. Sorting & Searching
  - a) Insertion sort
  - b) Bubble sort
  - c) Selection sort
  - d) Linear search
  - e) Binary search

**SEMESTER – I LINUX LABORATORY - PCAP102S****Objective:**

- ❖ To enable the students to learn the basic commands of Linux with sample programs.
- ❖ To make the students acquire skill in Linux Programming.

1. Working with Basic Linux Commands
2. Finding the Sum of the Series
3. Arguments Checking
4. Fibonacci Series
5. Finding the given String is Palindrome or not
6. Performing Menu Driven program
7. Sorting
8. Extension Conversion
9. File Manipulation
10. Pay Slip Generation
11. Creating a Electricity Bill
12. Generating student mark list

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**SEMESTER – II C++ AND DATA STRUCTURES - PCA806S****Objective:**

- ❖ To provide a sound understanding of the fundamental concepts of the object technology and to learn the realistic application of object oriented software systems using C++.
- ❖ To enable the student to learn the object oriented concepts and various types of data structures.

**UNIT - I:****[15 Hrs]**

**Introduction to OOPS:** OOPS Concepts and Applications– Overview of C++ - classes & Objects – Friend functions – friend classes – inline functions – constructors & destructors – static members – scope resolution operator – passing objects to functions – function returning objects - function overloading.

**UNIT - II:****[15 Hrs]**

**Operator Overloading and Inheritance:** Operator overloading – member operator overloading – friend operator overloading – overloading some special operators like [ ], ( ), a and comma operator – inheritance – types of inheritance – virtual base class – polymorphism - virtual function – pure virtual functions.

**UNIT - III:****[15 Hrs]**

**Class Templates:** Class templates and generic classes – function templates and generic functions – overloading a function template – power of templates – exception handling – derived class exception – over handling generic functions – exception handling function – terminate() unexpected ()- uncaught – exception ().

**UNIT - IV:****[15 Hrs]**

**Linear Data Structure:** General lists – Stacks – Queues – Circular queues – Evaluation of expressions-Singly linked lists – Circular linked lists – Doubly linked lists.

**UNIT - V:****[15 Hrs]**

**Non-Linear Data Structures:** Trees – binary trees –binary tree representations – binary search trees – binary tree traversals– application of trees (sets) – Graphs-representation of graphs – graph implementation – graph traversals – application of graph traversals – minimum cost spanning trees – shortest path problems.

**Text Books:**

1. Herbert Schildt, “C++: The Complete Reference” - Third Edition – Tata McGraw Hill, 1999.
2. Robert Lafore - “Object Oriented Programming in Turbo C++” - Galgotia 2001.
3. E. Balagurusamy - “Object Oriented Programming with C++” - TMH, New Delhi.
4. E. Horowitz, S. Sahni and Mehta – Fundamentals of Data structures in C++ - Galgotia – 1999.

**Reference Books:**

1. J.P. Cohen and J.W. Davidson – “C++ program design – An introduction to programming and object-oriented design – second edition – McGraw Hill – 1999.
2. Gregory L.Heileman – “Data structures, Algorithms and Object Oriented Programming” – Tata McGraw Hill International editions – 1996.

**SEMESTER – II DESIGN AND ANALYSIS OF ALGORITHM - PCA807S****Objective:**

- ❖ To enable the student to understand what an algorithm is and to teach the designing of an algorithm.
- ❖ To give an exposure in the development of algorithms.

**UNIT - I:****[15 Hrs]**

**Introduction to Divide and Conquer:** Algorithm – complexity analysis – introduction to random algorithm – general method – finding maximum and minimum – Strassen's matrix multiplication – quick sort – selection sort.

**UNIT - II:****[15 Hrs]**

**Greedy method:** General method – tree vertex splitting – job sequencing with dead lines – shortest path – knapsack 0/1. Dynamic Programming – general method – multistage graphs – string editing – traveling salesman problem.

**UNIT - III:****[15 Hrs]**

**Back tracking:** general method – Four Queens Problem – Eight Queens Problem – sum of subsets – graph coloring – depth first search – breadth first search.

**UNIT - IV:****[15 Hrs]**

**Branch and Bound:** General method – 0/1 Knapsack problem – traveling salesperson – algebraic manipulation.

**UNIT - V:****[15 Hrs]**

**Lower bound theory:** Comparison trees – Oracles and advisory arguments – lower bounds through reduction – basic concepts of NP-Hard and NP-Complete.

**Text Books:**

1. E. Horowitz, S. Sahni and S. Rajasekaran – “Computer Algorithms” – Galgotia.

**Reference Books:**

1. E. Horowitz, S. Sahni and Mehta – “Fundamentals of Data structures in C++” - Galgotia – 1999.
2. Gregory L. Heileman – “Data structures, Algorithms and Object Oriented Programming” – Mc Graw Hill International editions – 1996.
3. G. Brassard and P. Brateley – “Fundamentals of Algorithms” – PHI.
4. Baase, “Computer Algorithms” - 2000, Pearson Education.
5. S. Lakshmivarahan, Sundarshan K. Dhall, “Analysis and Design of Parallel Algorithms”.
6. Mark Allen Weiss - “Data Structures and Algorithm Analysis in C”

**SEMESTER – II COMPUTER GRAPHICS - PCA808****Objective:**

- ❖ To enable the students to learn about the working of input output devices.
- ❖ To learn the concepts of 2D and 3D transformations models and generation algorithms.
- ❖ To understand computer graphics and various graphic algorithms.

**UNIT-1:****[15 Hrs]**

**Video display devices:** – Raster scan systems – input devices – hardcopy devices – graphics software – output primitives – attributes of output primitives.

**UNIT-2:****[15 Hrs]**

**Two-dimensional transformation:** – clipping – window-view port mapping.

**UNIT-3:****[15 Hrs]**

User dialogue – input of graphical data – input functions – input device parameters – picture construction techniques – virtual reality environments.

**UNIT-4:****[15 Hrs]**

**Three dimensional concepts:** – 3D transformations – 3D viewing.

**UNIT-5:****[15 Hrs]**

**Visible surface detection:** – backface detection – depth buffer method – scan line method – a buffer method – properties of light infinitive color concepts – RGB color models – computer animation.

**Text Books:**

D. Hearn and M. P. Baker – “Computer Graphics” – PHI.

**Reference Books:**

1. W. M. Neumann and R. F. Sproull – “Principle of interactive computer graphics” – TMH, New Delhi.
2. D. F. Rogers, – “Procedural elements for Computer Graphics” - 2nd Edition, 2001, Tata McGraw-Hill, New Delhi.
3. Steven Harrington – “Computer Graphics – A programming Approach” – Mc Graw Hill, 1983.
4. Harry Katyon Jn. – “Microcomputer Graphics and Programming Techniques” – Van Nostrand Reinhold, 1982.
5. S. Harrington, 1989, Fundamentals of Computer Graphics, Tata McGraw-Hill, New Delhi.
6. Foley, Van Dan, Feiner, Hughes, 2000, Computer Graphics, Addison Wesley, Boston.
7. D. F. Rogers, J. A. Adams, 2002, Mathematical elements for Computer Graphics, 2nd Edition, Tata McGraw-Hill, New Delhi.

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**SEMESTER – II RELATIONAL DATA BASE - PCA809S  
MANAGEMENT SYSTEMS****UNIT-I:****[15 Hrs]**

**Sql Basics:** Introduction to RDBMS –Normalization: First Normal form-Second Normal form-Third Normal form-Creating a Table-Select, from, where and Order by-Logic and Value: Single value tests-LIKE-NULL and NOT NULL-Simple tests against a list of values-Combining logic-Dropping tables-Altering a table: Adding or modifying a column-Changing Data: insert-multiple inserts-update-merge-delete-rollback-commit and Save point

**UNIT-II:****[15 Hrs]**

**Sql Concepts:** Data types-String functions-Single value functions-Aggregate functions-List functions-Findings Rows with MAX or MIN-Date functions-Conversion functions-Transformation functions: Translate-Decode-Creating a view: Stability of a view-Order by views-Creating a read only view -Grouping Things Together: The use of group by and having-views of Groups-Sub queries-Advanced Sub queries-Outer joins-Natural and inner joins-Union, Intersect, and minus

**UNIT-III:****[15 Hrs]**

**Advanced Sql Concepts:** Decode and Case: if, then, else-Decode and Case-Creating a table from a table-Using Partitioned Tables: Creating a Partitioned Table-Creating Sub partitions-Indexes-Clusters-Sequences.

**Users, Roles and Privileges:** Creating a user-Password Management-Standard Roles-Format for grant command-Revoking privileges-What users can Grant: Moving to another user –Create synonym-Create a role-Granting privileges to a role-Granting a role to another role-Adding password to a role-Removing password from a role –Enabling & Disabling roles-Revoking privileges from a role-Drop a role

**UNIT-IV:****[15****Hrs]**

**Using SQL\*Loader to load data:** The Control file-Loading Variable length data-Starting the load-Syntax-Managing the data loads-Tuning Data loads-Using External Tables: Access an external data-External table: Creation-Limitation-Benefits.

**Object-Relational Databases:** Implementing Types-Object Views- Methods-Collectors (Nested Tables and Varying Arrays)-Using Large Objects-Advanced Object –Oriented Concepts.

**UNIT-V:****[15 Hrs]**

**Introduction to PL/SQL:** Declarations section-Executable commands section-Exception handling section-Triggers: Syntax-Types of Triggers: Row level- Statement level-before & after-Instead of Schema-Database level triggers-Enabling & Disabling triggers-Procedures, Functions & Packages-Cursor M

**Text Book:**

ORACLE DATABASE 10g-The complete reference- **KEVIN LONELY**, Tata McGraw-Hill Publishing Company Ltd 2004.

**Reference Book:** Oracle 9i- A Beginner's Guide-Michael Abhey, Mike Corey and Ian Abramson, Tata McGraw – Hill Publishing Company Ltd.,-2002.

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**SEMESTER – II MICROPROCESSOR AND ITS APPLICATIONS**  
**EPCA810S**

**Objective:**

- ❖ To enable the student to learn the programming concepts in microprocessors.
- ❖ To enable the student to understand assembly languages.

**UNIT-I:****[12****Hrs]**

**Introduction to 8086 assembly language programming:** – Development steps – Construction – Writing programs and development tools – Standard program structures – Simple programs – Jumps – while-do, repeat-until, delay loops.

**UNIT-II:****[12****Hrs]**

**Strings and Macros:** Strings – Procedures – Macros – Instruction descriptions – Assembler directives.

**UNIT-III:****[12 Hrs]**

**8086 microcomputer:** – Observing bus signals – Minimum mode system – Troubleshooting – 8086 Interrupts – Interrupt applications – Programmable Timer/Counter – Interrupt controller

**UNIT-IV:****[12 Hrs]**

**Handshaking and Interfacing:** Parallel ports – Handshaking – Interfacing digital devices – Analog Interfacing.

**UNIT-V:****[12 Hrs]**

**DMA:** DRAM's – Cache memory – Co-Processors – EDA Tools

**Text Books:**

1. Douglas V Hall – “Microprocessors and Interfacing – Programming and Hardware” – TMH – 1999.
2. K. Udayakumar and B.S. Umashankar – “Advanced Microprocessors and IBM PC Assembly language programming” – TMH - 1998.

**Reference Book:**

Mohammad Rafiguzzaman - “Microprocessor and microcomputer based system Design” - Universal Bookstall, 1990.

**SEMESTER – II FUZZY LOGIC SYSTEM****UNIT – I:****[12 Hrs]**

**INTRODUCTION:** Crisp sets: an overview - Basic types of fuzzy sets - Basic Concepts of fuzzy sets- Characteristics and Significance - Fuzzy sets Vs Crisp sets - Additional properties of Alpha Cuts - Representation of Fuzzy sets - Extension principle for Fuzzy sets - Operations on Fuzzy Sets - types of operations- Fuzzy compliments, Union, Intersection - Combination of Operations - Aggregation Operations- Fuzzy Arithmetic - Fuzzy numbers - Linguistic variables - Arithmetic Operation on Intervals And Fuzzy numbers - Lattice of Fuzzy numbers - Fuzzy Equation.

**UNIT – II:****[12 Hrs]**

**FUZZY RELATION:** Fuzzy Relation - Crisp & Fuzzy Relations - Projections & Cylindric Extensions - Binary Fuzzy Relations - Binary Relations on a Single Set - Fuzzy Equivalence Relations - Fuzzy Compatibility Relations - Fuzzy Ordering Relations - Fuzzy Morphisms - Compositions of Fuzzy Relation - Fuzzy Relation Equations - General Discussion - Problem Partitioning - Solution Method - Fuzzy Relation Equation Based on  $\text{Sup}_i \& \text{Inf}_i$  Completions - Approximate Solutions - The use of Neural Networks - Possibility Theory - Fuzzy Measures - Evidence Theory - Possibility Theory - Fuzzy Sets & Possibility Theory - Possibility Theory Vs Probability Theory.

**UNIT- III:****[12 Hrs]**

**FUZZY LOGIC:** Fuzzy Logic - Classical logic - Multi valued Logic - Fuzzy Propositions & Quantifiers - Linguistic Hedges - Inference from Conditional Fuzzy Propositions - Inference from Conditional & Qualified Propositions - Inference from Quantified Propositions - Uncertainty Based Information - Information & Uncertainty - Non specificity of Crisp Sets & Fuzzy sets- Fuzziness of Fuzzy sets - Uncertainty in Evidence Theory - Uncertainty Measures - Principles of Uncertainty - Approximate Reasoning - Fuzzy Expert Systems - Fuzzy Implication & Its selections - Multi conditional Approximate Reasoning - The Role of Fuzzy Relation Equations - Interval Valued Approximate Reasoning

**UNIT – IV:****[12 Hrs]**

**FUZZY SYSTEMS:** Fuzzy Systems - General Discussion - Overview of Fuzzy Controllers and Example - Fuzzy systems & Neural Networks - Fuzzy Neural Networks - Fuzzy Automata - Fuzzy Dynamic Systems - Pattern Recognition - Introduction - Fuzzy clustering - Fuzzy Pattern Recognition - fuzzy Image Processing- Fuzzy Databases & Information Retrieval Systems - General Discussion - Fuzzy Databases -Fuzzy Information Retrieval.

**UNIT- V:****[12 Hrs]**

**APPLICATIONS:** Engineering & Other applications - Introduction - Civil Engineering - Mechanical Engineering - Industrial Engineering - Computer Science Engineering - Reliability Theory - Robotics - Medicine - Economics - Decision Making - Fuzzy Systems & Genetic Algorithms - Fuzzy Regression - Interpersonal Communication.

**Text Books:**

1. George J. Klir & Bo Yuan, "Fuzzy Sets And Fuzzy Logic Theory And Applications.

**Reference Books:**

1. George J. Klir & Tina A. Folger, "Fuzzy Sets Uncertainty & Information", PHI, 2001.
2. J.S.R.Jang, C.T.Sun, E.Mizutani, "Neuro - Fuzzy and Soft Computing ", PHI, 2003

**SEMESTER – II C++ WITH DATA STRUCTURES - PCAP203S****LABORATORY****Objective:**

To make the students to implement data structures concepts using Object Oriented Programming.

1. Binary search using recursion.
2. Implementation of stack using arrays.
1. Implementation of stack using pointers.
2. Implementation of queue using arrays.
3. Implementation of queue using pointers.
4. Converting infix to postfix.
5. Evaluation of expression.
6. Polynomial addition using arrays.
7. Tree traversals.
8. Linked list.
9. Circular list.
10. Doubly linked list.
11. Binary tree traversal.

**SEMESTER – II RELATIONAL DATA BASE - PCAP204S****MANAGEMENT SYSTEMS LABORATORY****Objective:**

To enable students to write SQL queries and work with PL/SQL.

1. Writing Basic SQL Statements
2. Restricting and Sorting Data
3. Working with Built-in-functions of SQL.
5. Displaying Data from Multiple Tables.
6. Writing Sub queries
7. Creating PL\SQL blocks.
8. Handling Exceptions
9. Creating Stored procedures, functions and packages.
10. Working with Cursors.
11. Creating Triggers.
12. Working with Abstract Data Types
  - i) Types
  - ii) Object Views
  - iii) Methods
  - iv) Nested Tables
  - v) Varying arrays.