MCA New Syllabus

COURSE	SEM	CODE	COURSE TITLE	L-T-P	Credits	Internal Marks	External Marks	Total Marks
PGDIT	I	CS111	Probability & Statistics	3-1-0	4	30	70	100
		CS112	Mathematical Foundation of Computer Science	3-1-0	4	30	70	100
		CS113	Programming with C	3-1-0	4	30	70	100
		CS114	E-Commerce	3-1-0	4	30	70	100
		CS115	English Language Communication Skills	3-1-0	4	30	70	100
		CS116	**Tarseel-e-Urdu	3-0-0	---	30	70	100
		CSL17	Lab-I : Computer Programming Using C	0-0-3	2	50	50	100
		CSL18	Lab-II: PC Software	0-0-3	2	50	50	100
			Total		**24**			**700**
	II	CS121	Computer System Architecture	3-1-0	4	30	70	100
		CS122	Object Oriented Programming Using C++	3-1-0	4	30	70	100
		CS123	Data Structures	3-1-0	4	30	70	100
		CS124	Operating Systems	3-1-0	4	30	70	100
		Elective-I		3-1-0	4	30	70	100
		CSL26	Lab III : OOPS Using C++	0-0-3	2	50	50	100
		CSL27	Lab IV: Data structures Using C	0-0-3	2	50	50	100
			Total		**24**			**700**
M. Sc IT	III	CS231	Data Base Management System	3-1-0	4	30	70	100
		CS232	Analysis & Design of Algorithms	3-1-0	4	30	70	100
		CS233	Computer Networks	3-1-0	4	30	70	100
		CS234	Java Programming	3-1-0	4	30	70	100
		Elective-II		3-1-0	4	30	70	100
		CSL36	Lab V: DBMS	0-0-3	2	50	50	100
		CSL37	Lab VI: Java Programming	0-0-3	2	50	50	100
			Total		**24**			**700**
	IV	CS241	Software Engineering	3-1-0	4	30	70	100
		CS242	Data Warehousing and Data Mining	3-1-0	4	30	70	100
		CS243	Formal Language & Automata Theory	3-1-0	4	30	70	100
		CS244	Computer Graphics	3-1-0	4	30	70	100
		Elective-III		3-1-0	4	30	70	100
		CSL46	Lab VII: UML	0-0-3	2	50	50	100
		CSL47	Lab VIII: Linux Programming	0-0-3	2	50	50	100
			Total		**24**			**700**
M.C.A	V	CS351	Cloud Computing and Virtualization	3-1-0	4	30	70	100
		CS352	Web Technology	3-1-0	4	30	70	100
		CS353	Cryptography & Network Security	3-1-0	4	30	70	100
		CS354	Artificial Intelligence	3-1-0	4	30	70	100
		Elective-IV		3-1-0	4	30	70	100
		CSL56	Lab IX: Web Technology	0-0-3	2	50	50	100
		CSL57	Lab –X: Artificial Intelligence	0-0-3	2	50	50	100
			Total		**24**			**700**
	VI	CSP61	Project	----	16	200	200	400
		CSP62	Seminar	-----	4	50	50	100
			Total		**20**			**500**

Elective-I	Elective-II	Elective-III	Elective-IV
CSE21- Accounting and Financial Management CSE22- Multimedia Applications CSE23-Client Server Computing CSE24- Soft Computing CSE25- Information Security and Cyber Laws	CSE31- Mobile Computing CSE32- Advance Operating System CSE33-Componet Based Software Engineering CSE34- Information Retrieval Systems	CSE41- Distributed System CSE42- Software Testing and Quality Assurance CSE43- Software Project Management CSE44- Compiler Design	CSE51- Software Agent CSE52- Advance Computer Network CSE53- Software Quality Engineering CSE54- Distributed Database

**Tarseel-E-Urdu is treated as a non credit course, hence the marks will not be added in the result.
* For M.Sc (IT) degree, the student will follow the sixth semester in place of fourth semester.

PGDIT (Valid Credits: 48)	M. Sc.(IT) (Valid Credit: 96)	MCA (Valid Credits: 140)

PROBABILITY AND STATISTICS

CS: 111   **L-T-P: 3-1-0**

UNIT I :Probability: Sample space and events – Probability – The axioms of probability - Some elementary theorems –Addition theorem on probability & problems, Multiplication theorem &Conditional probability – Baye's theorem and related problems.

UNIT II :Random variables – Discrete and continuous – Distribution – Distribution function. Distribution - Binomial, poisson and normal distribution – related properties,moments,central moments,moment generating function and related problems.

UNIT III :Sampling distribution: Populations and samples - Sampling distributions of mean (known and unknown) proportions, sums and differences. Estimation: Point estimation – interval estimation - Bayesian estimation.

UNIT IV :Test of Hypothesis – Means and proportions – Hypothesis concerning one and two means – Type I and Type II errors. One tail, two-tail tests.Tests of significance – Student's t-test, chi square – test of goodness of fit and test of independence.

UNIT V :Curve fitting: The method of least squares – Inferences based on the least squares estimations -

Curvilinear regression — correlation coefficients-Karl persons and Spearman's rank correlation cofficient

TEXT BOOKS:

1. Probability and statistics for engineers (Erwin Miller And John E.Freund), R A Johnson

And C.B.Gupta.. 7th edition, Pearson Education / PHI.

2. Introduction to Probability and Statistics, 12th edition, W.Mendenhall, R.J.Beaver and

B.M.Beaver, Thomson. (Indian edition).

REFERENCE BOOKS:

1. Text book of Probability and Statistics Dr.Shahnaz Bathul, V.G.S.Publishers 2003.

2. Probability and Statistics in Engineering, 4th Edition, William W.Hines, Douglas

C.Montgomery, David M.Goldsman, Connie M.Borror, Wiley Student Edition.

3. Probability, Statistics and Queuing Theory, 2nd Edition, Trivedi, John Wiley and Sons

4. Introduction to Probability and Statistics, J.S.Milton, Jesse C.Arnold, 4th edition, TMH.

5. Probability,Statistics and Random Processes,Dr.K.Murugesan,P.Guruswamy,Anuradha

Mathematical Foundations of Computer Science

CS : 112   **L-T-P: 3-1-0**

UNIT I
Mathematical Logic: Statements and notations, Connectives, Well-formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Quantifiers, universal quantifiers. Predicates: Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Automatic Theorem Proving.

UNIT II
Relations: Properties of binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Lattices, Hasse diagram. Functions: Inverse Function, Composition of functions, recursive Functions, Lattice and its Properties, Pigeon hole principles and its application.

UNIT III
Elementary Combinatorics: Basics of counting, Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial and Multinomial theorem, the principles of Inclusion – Exclusion.

UNIT IV
Recurrence Relations: Generating Functions, Function of Sequences, Calculating Coefficients of generating functions, Recurrence relations, Solving recurrence relation by substitution and Generating functions, the method of Characteristic roots, solution of non-homogeneous Recurrence Relations.

UNIT V
Graph Theory: Representation of Graphs, DFS, BFS, Spanning Trees, Planar Graphs.
Graph Theory and Applications, Basic Concepts, Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers.

TEXT BOOKS:
1. Mathematical Foundation of Computer Science – ShahnazBathul, PHI.
2. Elements of Discrete Mathematics- A Computer Oriented Approach,C.L.Liu, D.P. Mohapatra,3edition,TMH.
3.Discrete Mathematics for Computer Scientists & Mathematicians, second edition,
J.L.Mott, A. Kandel, T.P. Baker, PHI
4. Discrete and Combinatorial Mathematics- An Applied Introduction-5th Edition– Ralph. P.Grimaldi, Pearson Education.
REFERENCE BOOKS:
1. Discrete Mathematics and its applications, 6th edition, K.H.Rosen, TMH.
2.Discrete Mathematical Structures, Mallik and Sen, CengageLearning.
3.Discrete Mathematical Structures, BernandKolman, Robert C. Busby, Sharon Cutler Ross, PHI/ Pearson Education.
4.Discrete Mathematics with Applications,ThomasKoshy,Elsevier.
5.Logic and Discrete Mathematics, Grass Man and Tremblay,Pearson Education.

UNIT – I

Introduction to programming – definitions and developing Algorithms and flowcharts for simple programs. Introduction to C Programming: Origin and history of c programming character set, Identifiers and keywords data types, constants, variables, operators, special operators, constants, Expressions, compound statements, structure of C program, Input and output function.

UNIT-II

C Statements – selection statements – if nested if's, the if-else –if ladder the conditional expressions, switch statement nested switch statements, iteration statements – the for loop, for loop variations, the while loop, the do-while loop, declaring variable with in selection and iteration statements, jump statement, the return statement, the go to submit, break statement, exit ( ) function, the continue statement, expression statement. Block statements.

UNIT – III

Arrays – Array what is an array? – Array Declaration, Array Initialization – Accessing individual elements of an array – Two Dimensional Arrays – Multi Dimensional Array, Passing an array element to a function – Rules of using an array. What are strings? String I/O, string Manipulation.

UNIT – IV

Functions – The General Form of a Function, Math functions, elements of function, function categories, types of functions, Function Arguments Call by value, Call by Reference, return statement. Uses of functions. C pre – processor, storage classes – Automatic – Register, Static and external. **Pointers** – definition, pointer variables, pointer expressions, arithmetic pointers, pointers and arrays, initializing pointers and functions and problems with pointers.

UNIT – V

Structures – definition, accessing structure members, structure assignments, array of structures, passing structures, structure pointers, uses of structures **Unions** – definitions, difference between structure and union, type def. **Files** – introduction to streams and files, basics of files – file pointer, opening and closing files, writing and reading character, file functions.

Recommended Text and Reference Books:

1. Let Us C by Yashwanth Kanethar.
2. "Programming in ANSI C" by E. Balaguruswamy.
3. Complete Reference of C++ by Herbert Schilde.

CS: 114   **L-T-P: 3-1-0**

UNIT-1
Introduction to Electronic Commerce – E-Commerce Framework- Anatomy of E-Commerce Applications – E-Commerce Consumer & Organization Applications- E- Commerce and World Wide Web – Internet Service Providers – Architectural Framework for Electronic Commerce – WWW as the Architecture- Hypertext publishing.

UNIT – II

Electronic Payment Systems – Types of Electronic Payment Systems – Digital Token Based Electronic Payment System – Smart Cards – Credit Cards – Risk in Electronic Payment Systems – Designing Electronic Payment Systems

UNIT-III: Electronic Data Interchange, EDI Applications in Business, EDI implementation, MIME, and value added networksWork flow automation and Coordination, Customization and Internal Commerce, Supply Chain Management(SCM).
UNIT –IV

Corporate Digital Library – Document Library, Digital Document Types, Corporate Data Warehouse, Advertising and Marketing – Information based Marketing, Advertising on Internet, On-Line Marketing Process, Market Research.

 UNIT –V

Consumer Search and Resource Discovery – Information Search and Retrieval, Commerce Catalogues, Information Filtering Multimedia – Key Multimedia Concepts, Digital Video and Electronic Commerce, Desktop Video Processing.

Suggested Readings:

1. Ravi Kalakota & A. B. Whinston - "Frontiers of Electronic Commerce", Pearson Education, India, 1999.

2. Daniel Minoli, Emma Minoli: "Web Commerce Technology Handbook", Tata McGraw Hill

3. Bajaj and Nag. "E-Commerce the cutting edge of Business". TMH.

4. E-Business & Commerce: Brahm Cazner, Wiley dreamtech.

Communication Skills

CS : 115 L-T-P: 3-0-2

UNIT I

Listening: Barriers of Listening skill-Approaches to Listening –How to improve Listening-exercises.

Speaking: Paralanguage: Sounds, stress, intonation- Art of conversation – Presentation skills – Public speaking- Expressing Techniques.

UNIT II

Reading: Kinds of Reading – Causes of reading difficulties – Reading strategies – exercises. **Writing: Effective writing –** Paragraph – Essay- Reports – Letters- Articles – Notices, Agenda & Minutes.

UNIT III

Communication: Modes of Communication- Barriers – Interpersonal skills – Negotiation skills – Non- Verbal communication - Etiquettes

UNIT IV

Group Dynamic skills: Group Discussion – Team building & Team work – Be a manager or leader – Decision making – creativity – Time & Stress management skills.

UNIT V

Interview sills: Types of Interviews – Preparing for interview – Preparing a CV – Structuring the interview _ Mock Interview _ Quick Tips.

Reference Books:

1. Sanghi, Seema, *Improve your communication skills*. 2nd edition.
2. Burnard, Philip. *Interpersonal skills Training: A source book of activities*. 2005.
3. Ashley, Roderic. *How to enhance your employability*. 1998.
4. Dr. Alex, K. Soft sill: *know yourself & Know the world*. 2010.
5. Cornerstone. *Developing softskills. 4th edition* 2005.
6. Jones, Daniel. *An outline of English phonetics*.
7. Aggarwal, Rohini. *Business communication and Organization & Management.*
8. Grath. E.H. *Basic Managerial skills for all.*
9. Maxwell, John C. *Developing the leader within you.*
10. Sunitha, V. *Personality Development & communicative English*

ترسیلِ اُردو

یونٹ:

1

اردو حروف تہجی، حروف تہجی کی شکلیں ، دو چشمی ھ ، حروف کی تحریر،اعراب، دو حرفی الفاظ،تین حرفی الفاظ،چار حرفی الفاظ، دو لفظی جملے،چار لفظی جملے۔

یونٹ: 2

دن اور مہینے، پھل اور سبزیاں ، موسم اور آب و ہوا، گھر اور چیزیں ۔

یونٹ: 3

بازار، ڈاک گھر، ریلوے اسٹیشن، بینک، عام استعمال کے چند الفاظ، خاص موقعوں کے جملے، اعداد۔

یونٹ: 4

اسم، ضمیر، فعل، صفت، اسم فعل اور صفت کی جمع، محاورے اور ضرب الامثال۔

یونٹ: 5

عبارتیں ، نظمیں ، کہانیاں ، مولانا آزاد نیشنل اردو یونیورسٹی کا ترانہ۔

C PROGRAMMING LAB

1. Write C program to input and output the text message.

2. Write C Program to perform all arithmetic operations.

3. Write C Program to utilize the math function.

4. Write C Program to perform the mathematical expressions.

5. Write C Program for Local and Global Variables.

6. Write C Program for internal static and external static variables.

7. Write C Program to find the roots of a Quadratic equation.

8. Write C Programs for all the Operators. (Arithmetical, Logical, Relational, Bitwise).

9. Write C Programs for Increment and Decrement Operators.

10. Write C Programs to implement the Ternary Operator.

11. Write C Programs for special Operators.

12. Write C Programs for all the Control Structures. (Sequential Control Structures, Conditional Control Structures, Iterative Control Structures).

13. Write C Programs to display the different types of patterns using nested for loop.

14. Write C Program for Statements. (switch, break, goto, continue etc.,).

15. Write C Program to print biggest number from n numbers.

16. Write a C Program to find the given integer number is even or odd number.

17. Write a C Program to calculate the factorial of a given number.

18. Write a C Program to swap the two numbers using temp variable and without using temp variable.

19. Reading and Printing a single dimensional array of elements.

20. Ascending and descending of an array.

21. Sum of all odd numbers and sum of all even numbers in a single dimensional array.

22. Mathematical operations on single dimensional arrays.

23. Reading and Printing a multi dimensional array of elements.

24. Mathematical operations on multi dimensional array of elements.

25. Passing an array element to a function.

26. Reading and Printing a string.

27. C Programs on String functions.

28. Write a C program to calculate string length by writing the user-define function.

29. Function declaration and initialization.

30. C Program to differentiate the parameters and arguments in functions.

31. Programs for different types of inbuilt functions.

32. Call by value and Call by reference programs in functions.

33. Write a program to swap the given 2 number using passing by reference.

34. Write C Programs to perform all valid arithmetic operations using pointers.

35. C programs on Structures and accessing of members of the structures.

36. Write a C program to print a book information (Book name, Book no, author name) by writing a structure.

37. Write a C program by passing structure elements to a function and display employee information (emp no, emp name, emp salary, and emp address).

38. C Programs on Reading a file from the secondary storage device.

39. C Program on writing and appending a file on the secondary storage device.

40. C Program on Opening and closing a file.

Text Books:

1. C programming and Data Structures, P. Padmanabham, Third Edition, BS Publications.
2. Let Us C by Yashwanth Kanethar.
3. "Programming in ANSI C" by E. Balaguruswamy.
4. Programming in C, 2nd Edition, Oxford by Pradip Dey, Mannas Ghosh.

Application Software: Enables the students in crafting Professional word documents,

Excel Spreadsheets, PowerPoint Presentations and making documents in Urdu.

Ms-Word:-

Week1-Task1: Creation of a document, saving a document in desire location by using SAVE AS option, editing the document, usage of SAVE option, Usage of functions like Cut, Copy, Paste.

1. Write steps for creating a document and save that document in D drive?
2. Edit the existing document and save the changes?
3. Write steps for copying the text and pasting it on next page?
4. Write steps for cutting the unwanted text?

Week 2-Task 2: Highlighting the text, changing the color of text. Changing text attributes, Applying different types of bullets and numberings to text.

1. Write steps for highlighting the text?
2. Write steps for making text Bold, Underline and Italic?
3. Write steps for applying different types of numbering?
4. Write steps for applying different customized Bullets; use any picture as a bullet?

Week3-Task3: Creating tables, altering the table by adding additional rows and columns.

Deleting a particular row or column, splitting the cells and merging the cells. Applying different types of Table Auto Formats to tables.

1. Write steps for creating a table with 10 rows and 7 columns?
2. Write steps for aligning the text in the center of the cell and apply the different?
3. Write steps for adding one row below 5th row and add one column in between 5th and 6th column?
4. Write steps for merging the 6 columns of a last row and split the 2nd column in to 2 sub columns?
5. Write steps for applying Table Auto format to the above table?

Week4-Task4: Mail Merge, Inserting page numbers. Adding Header and Footer to each page in a document .Using Spell check function to check the spellings of text. Finding the synonyms of a particular word. Printing the document

1. Write steps for inserting page numbers on each page?
2. Write complete steps for Mail Merge?
3. Write steps for adding header and footer to each page of a document?
4. What do you mean by spell check? How the spell check will be used in a document?
5. What is the process for finding the synonyms of a given word?

Ms- Excel:-

Week5-Task5: Creating the worksheet, Entering text in to cells, renaming the worksheet, Adding a new worksheet and deleting a worksheet from a workbook. Saving the workbook by using SAVE option. Using formula function to calculate mathematical operations like SUM, AVG…

1. write the no of rows and columns in worksheet
2. Steps for renaming a work sheet?

3. Steps for adding new work sheet?
4. Create a worksheet for calculating marks of 10 students, perform total of marks by using Sum formula.
5. Find the average of a number from the list of 20 numbers.

Week6-Task6: Highlighting the cells, changing the color of text in cells. Giving borders to cells. Sorting the given data in Ascending or Descending order.

1. Write steps for highlighting the cells.
2. Write steps for changing the color of text in cells.
3. Write steps for giving borders to cells.
4. Sort the given data in ascending order and descending order.

Week7-Task7: Using Logical functions. Inserting charts like Line chart, Pie chart, Bar chart to convert the information in graphical representation. Statistical functions.

1. Create a mark sheet of 10 students and perform Sum, average, result.
2. Calculate the rank and division of above students.
3. Convert the given mark sheet into different types of charts.
4. Use statistical functions to calculate Mean, Median, Mode, Standard Deviation, Variance, and Co-relation.

Ms-PowerPoint:-

Week 8-Task 8: Creating power point presentation by using slides, inserting a new slide in a presentation, Applying different slide Layouts, deleting a particular slide, saving the presentation

1. Write steps for inserting a new slide into presentation.
2. Write steps for applying different slide layouts to each slides.
3. Create a PPT with minimum of 5 slides by applying different layouts to each slide.
4. How will you delete the unwanted slide from your presentation?

Week 9-Task 9: Inserting of text boxes and Word Art option for entering the text into a slide, Inserting pictures, charts and Tables in a slide, viewing the presentation in Slide show.

1. Insert the text into slide by taking one text box.
2. Write headings or Titles by using Word Art.
3. Insert different pictures and charts into your presentation.
4. Create a PPT of min 5 slides insert some pictures and text boxes in slides and view this presentation by Slide show, and write steps to do this.

Week 10-Task 10: Applying different slide design to slides, Applying different slide color schemes and Animation Schemes to a presentation, applying the effects to the text and Images of a slide by using custom animation, applying the effects to the slides by using slide transition schemes.

1. Write steps for applying different slide designs to each slide.
2. Write steps for applying different slide Color scheme to each slide.
3. Write steps for applying different slide animation scheme to each slide.
4. Apply custom animation to text and images.
5. Create a PPT of minimum 10 slides and apply different attributes to your presentation.

Ms-Access:-

Week 11-Task 11:

1. Write steps for opening Ms-Access
2. Write steps for saving Database and Table

3. Create a Student Database with the following details:
Student Name

Number

Total Marks

Address.

Week 11-Task 11:

1. Create an employee database with your own fields and prepare reports:

Computer System Architecture

UNIT -I:

Digital Logic Circuits: Digital Computers, Logic Gates, Boolean Algebra, Map Simplification, Combinational Circuits, Flip Flops, Sequential Circuits. Digital Components: Integrated Circuits, Decoder, Multiplexers, 'Registers, Shift Registers, Binary counter, Memory unit. Data Representation: Data types, Complements, Fixed and Floating Point Representation, Other binary codes and error Detection codes.

UNIT –II

Register Transfer and Micro operations:. Register Transfer language, Register transfer,

Bus and Memory Transfer, Arithmetic Micro operations, Logic Micro operations, Shift

Micro operations and Arithmetic logic shift unit. Basic Computer Organization and Design: Instruction codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycles, Memory Reference Instructions, Input, Output and Interrupts, Design of Accumulator logic.

UNIT –III

Programming the Basic Computer: Introduction, Machine Language, Assembly Language, The Assembler, Programming Arithmetic and Logic Operations, Subroutines,

and input -output ,Programming. Micro programmed Control: Control Memory, Address Sequencing, Micro program Example, Design of Control Unit.

UNIT –IV

Central Processing Unit: Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation,

Program Control, RISC. Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline. Computer Arithmetic: Addition and Subtraction, Multiplication algorithms, Division Algorithms, Floating point arithmetic operations, decimal arithmetic unit, and decimal arithmetic operations.

UNIT –V

Input -Output organization: Peripheral Devices, I/O output interface, Asynchronous data transfer, Modes of transfer, Priority Interrupt, DMA, Input output Processor, Serial

Communication. Memory Organization: Memory Hierarchy, Main Memory, Cache Memory.

Text Books:

- M. Morris Mano, "Computer System Architecture", Pearson Asia / Prentice Hall, Third edition, 1993.

References:

- Sivarama P Dandamudi "Fundamentals of Computer Organization and Design"
  , Springer/ Dream tech Publishers, 2003.
- William Stallings, "Computer Organization & Architecture", Pearson Educa**tion, Sixth: Edition, 2003.**

OBJECT ORIENTED PROGRAMMING USING C++

CS: 122   **L-T-P: 3-1-0**

UNIT – I
Principles of OOP: Programming paradigms, basic concepts, benefits of OOP, applications of OOP Introduction to C++: History of C++, structure of C++, basic data types, type casting, type modifiers, operators and control structures, input and output statements in C++. Classes and objects: class specification, member function specification, scope resolution operator, access qualifiers, instance creation .

UNIT-II
Functions: Function prototyping, function components, passing parameters, call by reference, return by reference, inline functions, default arguments, overloaded function. Pointers: Array of objects, pointers to objects, this pointer, dynamic allocation operators, dynamic objects.

UNIT – III
Constructors: Constructors, parameterized constructors, overloaded constructors, constructors with default arguments, copy constructors, static class members and static objects. Operator overloading: Overloading unary and binary operator, overloading the operator using friend function, stream operator overloading and data conversion.

UNIT – IV
Inheritance: Defining derived classes, single inheritance, protected data with private inheritance, multiple inheritance, multi-level inheritance, hierarchical inheritance, hybrid inheritance, multi path inheritance, constructors in derived and base class, abstract classes, virtual function and dynamic polymorphism, virtual destructor.

UNIT –V
Exception Handling: Principle of Exception handling, exception handling mechanism, multiple catch, nested try, rethrowing the exception. Streams in C++: Stream classes, formatted and unformatted data, manipulators, user defined manipulators, file streams, file pointer manipulation, file open and close. Templates: Template functions and Template classes.

TEXT BOOK
1. Complete Reference of C++ by Herbert Schilde
2. Object Oriented Programming with C++ By E.Balaguruswamy

REFERENCE Books
1. Object Oriented Turbo C Plus Plus by Robert Lafore
2. Programming with C Plus Plus by D.RaviChandra
3. Object Oriented Turbo C Plus Plus by Balaguruswamy
4. C Plus Plus Premier Plus by Stephen Prata

DATA STRUCTURES USING C

CS: 123   **L-T-P: 3-1-0**

Unit - I
Introduction: Basic Terminology, Elementary Data Organization, Algorithm, Efficiency of an Algorithm, Time and Space Complexity, Asymptotic notations: Big-Oh, Time-Space trade-off. Abstract Data Types (ADT)
Arrays: Definition, Single and Multidimensional Arrays.
Linked lists: Array Implementation and Dynamic Implementation of Singly Linked Lists, Doubly Linked List, Circularly Linked List, Operations on a Linked List. Insertion, Deletion, Traversal, Polynomial Representation and Addition, Generalized Linked List

Unit – II
Stacks: Abstract Data Type, Primitive Stack operations: Push & Pop, Array and Linked Implementation of Stack in C, Application of stack: Prefix and Postfix Expressions, Evaluation of postfix expression, Recursion, Tower of Hanoi Problem, Simulating Recursion, Principles of recursion, Tail recursion, Removal of recursion Queues, Operations on Queue: Create, Add, Delete, Full and Empty, Circular queues, Array and linked implementation of queues in C, Dequeue and Priority Queue.

Unit – III
Trees: Basic terminology, Binary Trees, Binary Tree Representation: Array Representation and Dynamic Representation, Complete Binary Tree, Extended Binary Trees, Array and Linked Representation of Binary trees, Tree Traversal algorithms: Inorder, Preorder and Postorder, Threaded Binary trees, Traversing Threaded Binary trees, Huffman algorithm.

Unit – IV
Graphs: Terminology, Sequential and linked Representations of Graphs: Adjacency Matrices, Adjacency List, Adjacency Multi list, Graph Traversal : Depth First Search and Breadth First Search, Connected Component, Spanning Trees, Minimum Cost Spanning Trees: Prims and Kruskal algorithm. Shortest Path algorithm: Warshal Algorithm and Dijikstra Algorithm.

Unit – V
Searching : Sequential search, Binary Search, Comparison and Analysis Internal Sorting: Insertion Sort, Selection, Bubble Sort, Quick Sort, Merge Sort, Heap Sort, Radix Sort.
Search Trees: Binary Search Trees (BST), Insertion and Deletion in BST, AVL trees, ntroduction to m-way Search Trees, B Trees & B+ Trees
Hashing: Hash Function, Linear probing.

References:
1. Aaron M. Tenenbaum, Yedidyah Langsam and Moshe J. Augenstein "Data Structures Using C and C++" , PHI
2. Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publication 3. Jean Paul Trembley and Paul G. Sorenson, "An Introduction to Data Structures with applications", McGraw Hill
4. R. Kruse etal, "Data Structures and Program Design in C", Pearson Education
5. Lipschutz, "Data Structures" Schaum's Outline Series, TMH
6. G A V Pai, "Data Structures and Algorithms", TMH

Operating System

UNIT-I

Operating system concepts: OS definition and services; Types and features : batch systems, multiprogramming, multitasking, parallel systems, distributed systems, real-time systems, time-sharing systems, PC systems; System Calls types, System Programs

UNIT II

Process vs. Thread: process states, process control block; interprocess communication; Process Synchronization:, Classical problems of synchronization; CPU Scheduling: Criteria; Algorithms: FCFS, SJF, Priority, Round- Critical section problem and solution criteria, Semaphores Robin, Real-time.

UNIT III

Memory Management: Paging and Segmentation approaches, virtual memory, Demand Paging and Page Replacement algorithms; Deadlocks: necessary conditions, prevention, avoidance and recovery, banker's algorithm.

UNIT IV

File management: File system Structure, allocation methods: Contiguous allocation, Linkedallocation, indexed allocation: free space management: Bit vector, linked list, grouping, counting: Directory implementation: Linear List, Hash table. Device Management: Disk structure, Disk scheduling:, Selecting Disk Scheduling algorithm.

UNIT V

UNIX: Essential commands and utilities, Unix files, directory structure, file security, pipe, filter, Bourne shell programming features, systems calls classification and basics (reg. file manipulation, process, signal and IPC); Linux: System components, Process management, scheduling, memory management, Networking software layers, Security, various editors, I/O devices, IPC .

UNIT VI

Windows: System components, block diagram, operating system model, architecture overview, file systems, environmental subsystems, networking, programmer interface, IPC, memory management, security; Differences between client and server versions: b/w Windows 2000 Professional and Server, b/w Windows XP and Windows Server 2003.

Suggested Readings:

4. Operating System Concepts by Silberschatz and Galvin;Addison Wesley
5. Ditributed Operating Systems by Andrew S. Tannenbaum; Pearson Education
6. UNIX Concepts and Applications by Sumitabha Das; Tata MC-Graw Hill
7. Microsoft Windows Internal by Mark E. Russinovich, David A. Solomon; WP publishers & distributors (P)

OBJECT ORIENTED PROGRAMMING USING C++ LAB

CSL: 26   **L-T-P: 0-0-4**

1. Inline Function.

2. Function Overloading.

3. Programs on Classes.

4. Constructors, Destructors

5. Static Members.

6. Friend Function, Friend Class

7. Dynamic Memory Allocation using new and delete.

8. Pointer to object.

9. Overloading unary operator, Overloading binary Operators

10. Overloading binary operators using Friend function.

11. Single and Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance.

12. Constructors and Destructors in derived classes.

13. Virtual Function.

14. Programs on file handling using classes.

List of Data Structure Programme

1. Write a Programme to implement a stack using array.
2. Write a Programme to implement a stack using linked list
3. Write a Programme to implement a queue using array.
4. Write a Programme to implement a queue using linked list
5. Write a Programme to implement a circular queue using array
6. Write a Programme to implement a simple linked list
7. Write a Programme to implement a circular linked list
8. Write a Programme to implement a doubly linked list
9. Write a Programme to count a node in linked list
10. Write a Programme to implement a reversed a linked list
11. Write a Programme to implement a quick sort.
12. Write a Programme to implement a merge sort.

Information Security

UNIT 1:

Information Security Context and CBK: Introduction, Growing IT Security Importance and New Opportunities, Increasing Demand by Government and Private Industry; Becoming an IS specialist; Multidisciplinary Approach; contextualizing Information Security; IS Expertise & Business Systems. Security Management Practices: Security Architecture and Models; BCP; LAW, Investigations and Ethics, Physical Security; Operation Security; ACM Systems and Methodology; Cryptography; Telecommunications, Network and Internet Security; and Application Development Security.

UNIT II:

Information Security Principles: Absolute Security; Three Security Goals; DID as Strategy; When Left on Their Own; Security Requirements; Security Through Obscurity Is Not an Answer; Security = Risk Management; Three Types of Security Controls; Complexity Is the Enemy of Security; Fear, Uncertainty, and Doubt; People, process and Technology; and Open Disclosure of Vulnerabilities.

UNIT III:

Security Management and BC-DRP: Security policies, programme –level, programme-framework, Issue-specific and system-specific policies; Development and Management of Security Policies: Security Objectives, Operational Security and Policy Implementation; Policy Support Documents Regulations; Standards Taxonomy; Risk Analysis and Management; Responsible for security? Business Continuity plan; Disaster Recovery planning: Identifying Recovery Strategies, Shared-site Agreements, Alternates sites, Additional Agreements, Testing DRP.

UNIT IV:

Security Architecture and Models: Defining TCB: Rings of Trust; Protection Mechanisms in a TCB: System Security Assurance concepts, Goals of Security Testing and Formal Security Testing Models; TCSE: Minimal, Discretionary, Mandatory and Verified Protection; Trusted Network Interpretation and TCSEC; Comparing ITSEC and TCSES & ITSEC; CTCPEC, FCITS; CI Models: Bell – Lapadula Model, Biba Integrity Model and Advanced Models; PPO, SFR,EAL and the CEL.

UNIT V:

Cryptography: Cryptography Needs and significance, Terms and Concepts: Cyphertext, Cryptanalysis, Cryptosystem, Message Digest etc; STE and Substitution ; Digesting Data; Digital Certificates, Certification and Envelop; symmetric and Symmetric Cryptography; Root, Private and Public; Digital Cryptography – Hashing Functions, Block Ciphers and Implementation of PPK Cryptography**Operations Security and Access Control Systems**: Operations Security Principles; Operations Security Process Controls; Operations Security Controls in Action; Information Owner, Discretionary Access Control, ACL, MAC, RAC; Principles of Authentication: The Problems with Passwords, Multifactor Authentication,

Multimedia Applications

Unit-I

Multimedia Fundamentals: Define the concept of multimedia, fundamental criteria for the design of a multimedia presentation, multimedia application goals &objectives, opportunities in multimedia production, Role of multimedia development team members, avoiding problems in planning a multimedia application.

Unit-II

Multimedia Building Blocks: Text, Graphics, video capturing, Sound capturing, editing.

Basic design principle: proximity, visual hierarchy, Symmetry / Asymmetry, Repetition, unity, Contrast, dynamics, Emphasis, Multimedia Authoring tools.

Unit-III

Design, Development and evaluation of multimedia a system: The development of user interface design, Design Process,

Unit-IV

Multimedia & the Internet, Multimedia conferencing, Multimedia file sharing, Multimedia broadcasting, Multimedia file handling: Compression & Decompression, Data & file formats standard.

Reference Books:

John Villamil-Casanova, Louis Molina, An introduction to multimedia

Mohammad Dastbaz, Desgning Interactive Multimedia Systems

Bohdan O. Szuprowicz, Multimedia Networking

Stephen McGloughlin, Multimedia on the web

CLIENT SERVER COMPUTING

CSE : 23   **L-T-P: 3-1-0**

Unit I

Client/Server Computing: DBMS concept and architecture, Single system image, Client Server architecture, mainframe-centric client server computing, downsizing and client server computing, preserving mainframe applications investment through porting, client server development tools, advantages of client server computing.

Unit II

Components of Client/Server application: The client: services, request for services, RPC, windows services, fax, print services, remote boot services, other remote services, Utility Services & Other Services, Dynamic Data Exchange (DDE), Object Linking and Embedding (OLE), Common Object Request Broker Architecture (CORBA).

The server: Detailed server functionality, the network operating system, available platforms, the network operating system, available platform, the server operating system.

Unit III

Client/Server Network: connectivity, communication interface technology, Interposes communication, wide area network technologies, network topologies (Token Ring, Ethernet, FDDI, CDDI) network management, Client-server system development: Software, Client–Server System Hardware: Network Acquisition, PC-level processing unit, Macintosh, notebooks, pen, UNIX workstation, x-terminals, server hardware.

Unit IV

Client Server Systems Development: Services and Support, system administration, Availability, Reliability, Serviceability, Software Distribution, Performance, Network management, Help Disk, Remote Systems Management Security, LAN and Network Management issues. Training, Training advantages of GUI Application, System Administrator training, Database Administrator training, End-user training.

Unit V

Data Storage: magnetic disk, magnetic tape, CD-ROM, WORM, Optical disk, mirrored disk, fault tolerance, RAID, RAID-Disk network interface cards. Network protection devices, Power Protection Devices, UPS, Surge protectors.

The future of client server Computing Enabling Technologies, The transformational system.

Text Book:

1. Patrick Smith & Steave Guengerich, "Client / Server Computing", PHI
2. Dawna Travis Dewire, "Client/Server Computing", TMH

Reference Books:

3. Majumdar & Bhattacharya, "Database management System", TMH
4. Korth, Silberchatz, Sudarshan, "Database Concepts", McGraw Hill
5. Elmasri, Navathe, S.B, "Fundamentals of Data Base System", Addison Wesley

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UNIT I FUZZY SET THEORY

Introduction to Neuro – Fuzzy and Soft Computing – Fuzzy Sets – Basic Definition and Terminology – Set-theoretic Operations – Member Function Formulation and Parameterization – Fuzzy Rules and Fuzzy Reasoning – Extension Principle and Fuzzy Relations – Fuzzy If-Then Rules – Fuzzy Reasoning – Fuzzy Inference Systems – Mamdani Fuzzy Models – Sugeno Fuzzy Models – Tsukamoto Fuzzy Models – Input Space Partitioning and Fuzzy Modeling.

UNIT II OPTIMIZATION

Derivative-based Optimization – Descent Methods – The Method of Steepest Descent – Classical Newton's Method – Step Size Determination – Derivative-free Optimization – Genetic Algorithms – Simulated Annealing – Random Search – Downhill Simplex Search.

UNIT III NEURAL NETWORKS

Supervised Learning Neural Networks – Perceptrons - Adaline – Backpropagation Mutilayer Perceptrons – Radial Basis Function Networks – Unsupervised Learning Neural Networks – Competitive LearningNetworks – Kohonen Self-Organizing Networks – Learning Vector Quantization – Hebbian Learning.

UNIT IV NEURO FUZZY MODELING

Adaptive Neuro-Fuzzy Inference Systems – Architecture – Hybrid Learning Algorithm – Learning Methods that Cross-fertilize ANFIS and RBFN – Coactive Neuro Fuzzy Modeling – Framework Neuron Functions for Adaptive Networks – Neuro Fuzzy Spectrum.

UNIT V APPLICATIONS OF COMPUTATIONAL INTELLIGENCE

Printed Character Recognition – Inverse Kinematics Problems – Automobile Fuel Efficiency Prediction – Soft Computing for Color Recipe Prediction.

TEXT BOOK

1. J.S.R.Jang, C.T.Sun and E.Mizutani, "Neuro-Fuzzy and Soft Computing", PHI, 2004, Pearson Education 2004.

REFERENCES

1. Timothy J.Ross, "Fuzzy Logic with Engineering Applications", McGraw-Hill, 1997.
2. Davis E.Goldberg, "Genetic Algorithms: Search, Optimization and Machine Learning", Addison Wesley, N.Y., 1989.
3. S. Rajasekaran and G.A.V.Pai, "Neural Networks, Fuzzy Logic and Genetic Algorithms", PHI, 2003.
4. R.Eberhart, P.Simpson and R.Dobbins, "Computational Intelligence - PC Tools", AP Professional, Boston, 1996.

Computer System Architecture

UNIT -I:

Digital Logic Circuits: Digital Computers, Logic Gates, Boolean Algebra, Map Simplification, Combinational Circuits, Flip Flops, Sequential Circuits. Digital Components: Integrated Circuits, Decoder, Multiplexers, 'Registers, Shift Registers, Binary counter, Memory unit. Data Representation: Data types, Complements, Fixed and Floating Point Representation, Other binary codes and error Detection codes.

UNIT –II

Register Transfer and Micro operations:. Register Transfer language, Register transfer,

Bus and Memory Transfer, Arithmetic Micro operations, Logic Micro operations, Shift

Micro operations and Arithmetic logic shift unit. Basic Computer Organization and Design: Instruction codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycles, Memory Reference Instructions, Input, Output and Interrupts, Design of Accumulator logic.

UNIT –III

Programming the Basic Computer: Introduction, Machine Language, Assembly Language, The Assembler, Programming Arithmetic and Logic Operations, Subroutines,

and input -output ,Programming. Micro programmed Control: Control Memory, Address Sequencing, Micro program Example, Design of Control Unit.

UNIT –IV

Central Processing Unit: Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation,

Program Control, RISC. Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline. Computer Arithmetic: Addition and Subtraction, Multiplication algorithms, Division Algorithms, Floating point arithmetic operations, decimal arithmetic unit, and decimal arithmetic operations.

UNIT –V

Input -Output organization: Peripheral Devices, I/O output interface, Asynchronous data transfer, Modes of transfer, Priority Interrupt, DMA, Input output Processor, Serial

Communication. Memory Organization: Memory Hierarchy, Main Memory, Cache Memory.

Text Books:

- M. Morris Mano, "Computer System Architecture", Pearson Asia / Prentice Hall, Third edition, 1993.

References:

- Sivarama P Dandamudi "Fundamentals of Computer Organization and Design"
  , Springer/ Dream tech Publishers, 2003.
- William Stallings, "Computer Organization & Architecture", Pearson Educa**tion, Sixth: Edition, 2003.**

OBJECT ORIENTED PROGRAMMING USING C++

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UNIT – I

Principles of OOP: Programming paradigms, basic concepts, benefits of OOP, applications of OOP Introduction to C++: History of C++, structure of C++, basic data types, type casting, type modifiers, operators and control structures, input and output statements in C++. Classes and objects: class specification, member function specification, scope resolution operator, access qualifiers, instance creation .

UNIT-II

Functions: Function prototyping, function components, passing parameters, call by reference, return by reference, inline functions, default arguments, overloaded function. Pointers: Array of objects, pointers to objects, this pointer, dynamic allocation operators, dynamic objects.

UNIT – III

Constructors: Constructors, parameterized constructors, overloaded constructors, constructors with default arguments, copy constructors, static class members and static objects. Operator overloading: Overloading unary and binary operator, overloading the operator using friend function, stream operator overloading and data conversion.

UNIT – IV

Inheritance: Defining derived classes, single inheritance, protected data with private inheritance, multiple inheritance, multi-level inheritance, hierarchical inheritance, hybrid inheritance, multi path inheritance, constructors in derived and base class, abstract classes, virtual function and dynamic polymorphism, virtual destructor.

UNIT –V

Exception Handling: Principle of Exception handling, exception handling mechanism, multiple catch, nested try, rethrowing the exception. Streams in C++: Stream classes, formatted and unformatted data, manipulators, user defined manipulators, file streams, file pointer manipulation, file open and close. Templates: Template functions and Template classes.

TEXT BOOK
3. Complete Reference of C++ by Herbert Schilde
4. Object Oriented Programming with C++ By E.Balaguruswamy

REFERENCE Books
5. Object Oriented Turbo C Plus Plus by Robert Lafore
6. Programming with C Plus Plus by D.RaviChandra
7. Object Oriented Turbo C Plus Plus by Balaguruswamy
8. C Plus Plus Premier Plus by Stephen Prata

DATA STRUCTURES USING C

Unit - I
Introduction: Basic Terminology, Elementary Data Organization, Algorithm, Efficiency of an Algorithm, Time and Space Complexity, Asymptotic notations: Big-Oh, Time-Space trade-off. Abstract Data Types (ADT)
Arrays: Definition, Single and Multidimensional Arrays.
Linked lists: Array Implementation and Dynamic Implementation of Singly Linked Lists, Doubly Linked List, Circularly Linked List, Operations on a Linked List. Insertion, Deletion, Traversal, Polynomial Representation and Addition, Generalized Linked List

Unit – II
Stacks: Abstract Data Type, Primitive Stack operations: Push & Pop, Array and Linked Implementation of Stack in C, Application of stack: Prefix and Postfix Expressions, Evaluation of postfix expression, Recursion, Tower of Hanoi Problem, Simulating Recursion, Principles of recursion, Tail recursion, Removal of recursion Queues, Operations on Queue: Create, Add, Delete, Full and Empty, Circular queues, Array and linked implementation of queues in C, Dequeue and Priority Queue.

Unit – III
Trees: Basic terminology, Binary Trees, Binary Tree Representation: Array Representation and Dynamic Representation, Complete Binary Tree, Extended Binary Trees, Array and Linked Representation of Binary trees, Tree Traversal algorithms: Inorder, Preorder and Postorder, Threaded Binary trees, Traversing Threaded Binary trees, Huffman algorithm.

Unit – IV
Graphs: Terminology, Sequential and linked Representations of Graphs: Adjacency Matrices, Adjacency List, Adjacency Multi list, Graph Traversal : Depth First Search and Breadth First Search, Connected Component, Spanning Trees, Minimum Cost Spanning Trees: Prims and Kruskal algorithm. Shortest Path algorithm: Warshal Algorithm and Dijikstra Algorithm.

Unit – V
Searching : Sequential search, Binary Search, Comparison and Analysis Internal Sorting: Insertion Sort, Selection, Bubble Sort, Quick Sort, Merge Sort, Heap Sort, Radix Sort.
Search Trees: Binary Search Trees (BST), Insertion and Deletion in BST, AVL trees, ntroduction to m-way Search Trees, B Trees & B+ Trees
Hashing: Hash Function, Linear probing.

References:
1. Aaron M. Tenenbaum, Yedidyah Langsam and Moshe J. Augenstein "Data Structures Using C and C++" , PHI
2. Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publication 3. Jean Paul Trembley and Paul G. Sorenson, "An Introduction to Data Structures with applications", McGraw Hill
4. R. Kruse etal, "Data Structures and Program Design in C", Pearson Education
5. Lipschutz, "Data Structures" Schaum's Outline Series, TMH
6. G A V Pai, "Data Structures and Algorithms", TMH

Operating System

UNIT-I

Operating system concepts: OS definition and services; Types and features : batch systems, multiprogramming, multitasking, parallel systems, distributed systems, real-time systems, time-sharing systems, PC systems; System Calls types, System Programs

UNIT II

Process vs. Thread: process states, process control block; interprocess communication; Process Synchronization:, Classical problems of synchronization; CPU Scheduling: Criteria; Algorithms: FCFS, SJF, Priority, Round- Critical section problem and solution criteria, Semaphores Robin, Real-time.

UNIT III

Memory Management: Paging and Segmentation approaches, virtual memory, Demand Paging and Page Replacement algorithms; Deadlocks: necessary conditions, prevention, avoidance and recovery, banker's algorithm.

UNIT IV

File management: File system Structure, allocation methods: Contiguous allocation, Linkedallocation, indexed allocation: free space management: Bit vector, linked list, grouping, counting: Directory implementation: Linear List, Hash table. Device Management: Disk structure, Disk scheduling:, Selecting Disk Scheduling algorithm.

UNIT V

UNIX: Essential commands and utilities, Unix files, directory structure, file security, pipe, filter, Bourne shell programming features, systems calls classification and basics (reg. file manipulation, process, signal and IPC); Linux: System components, Process management, scheduling, memory management, Networking software layers, Security, various editors, I/O devices, IPC .

UNIT VI

Windows: System components, block diagram, operating system model, architecture overview, file systems, environmental subsystems, networking, programmer interface, IPC, memory management, security; Differences between client and server versions: b/w Windows 2000 Professional and Server, b/w Windows XP and Windows Server 2003.

Suggested Readings:

8. Operating System Concepts by Silberschatz and Galvin;Addison Wesley
9. Ditributed Operating Systems by Andrew S. Tannenbaum; Pearson Education
10. UNIX Concepts and Applications by Sumitabha Das; Tata MC-Graw Hill
11. Microsoft Windows Internal by Mark E. Russinovich, David A. Solomon; WP publishers & distributors (P)

OBJECT ORIENTED PROGRAMMING USING C++ LAB

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15. Inline Function.

16. Function Overloading.

17. Programs on Classes.

18. Constructors, Destructors

19. Static Members.

20. Friend Function, Friend Class

21. Dynamic Memory Allocation using new and delete.

22. Pointer to object.

23. Overloading unary operator, Overloading binary Operators

24. Overloading binary operators using Friend function.

25. Single and Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance.

26. Constructors and Destructors in derived classes.

27. Virtual Function.

28. Programs on file handling using classes.

List of Data Structure Programme

13. Write a Programme to implement a stack using array.
14. Write a Programme to implement a stack using linked list
15. Write a Programme to implement a queue using array.
16. Write a Programme to implement a queue using linked list
17. Write a Programme to implement a circular queue using array
18. Write a Programme to implement a simple linked list
19. Write a Programme to implement a circular linked list
20. Write a Programme to implement a doubly linked list
21. Write a Programme to count a node in linked list
22. Write a Programme to implement a reversed a linked list
23. Write a Programme to implement a quick sort.
24. Write a Programme to implement a merge sort.

Information Security

UNIT 1:

Information Security Context and CBK: Introduction, Growing IT Security Importance and New Opportunities, Increasing Demand by Government and Private Industry; Becoming an IS specialist; Multidisciplinary Approach; contextualizing Information Security; IS Expertise & Business Systems. Security Management Practices: Security Architecture and Models; BCP; LAW, Investigations and Ethics, Physical Security; Operation Security; ACM Systems and Methodology; Cryptography; Telecommunications, Network and Internet Security; and Application Development Security.

UNIT II:

Information Security Principles: Absolute Security; Three Security Goals; DID as Strategy; When Left on Their Own; Security Requirements; Security Through Obscurity Is Not an Answer; Security = Risk Management; Three Types of Security Controls; Complexity Is the Enemy of Security; Fear, Uncertainty, and Doubt; People, process and Technology; and Open Disclosure of Vulnerabilities.

UNIT III:

Security Management and BC-DRP: Security policies, programme –level, programme-framework, Issue-specific and system-specific policies; Development and Management of Security Policies: Security Objectives, Operational Security and Policy Implementation; Policy Support Documents Regulations; Standards Taxonomy; Risk Analysis and Management; Responsible for security? Business Continuity plan; Disaster Recovery planning: Identifying Recovery Strategies, Shared-site Agreements, Alternates sites, Additional Agreements, Testing DRP.

UNIT IV:

Security Architecture and Models: Defining TCB: Rings of Trust; Protection Mechanisms in a TCB: System Security Assurance concepts, Goals of Security Testing and Formal Security Testing Models; TCSE: Minimal, Discretionary, Mandatory and Verified Protection; Trusted Network Interpretation and TCSEC; Comparing ITSEC and TCSES & ITSEC; CTCPEC, FCITS; CI Models: Bell – Lapadula Model, Biba Integrity Model and Advanced Models; PPO, SFR,EAL and the CEL.

UNIT V:

Cryptography: Cryptography Needs and significance, Terms and Concepts: Cyphertext, Cryptanalysis, Cryptosystem, Message Digest etc; STE and Substitution ; Digesting Data; Digital Certificates, Certification and Envelop; symmetric and Symmetric Cryptography; Root, Private and Public; Digital Cryptography – Hashing Functions, Block Ciphers and Implementation of PPK Cryptography**Operations Security and Access Control Systems**: Operations Security Principles; Operations Security Process Controls; Operations Security Controls in Action; Information Owner, Discretionary Access Control, ACL, MAC, RAC; Principles of Authentication: The Problems with Passwords, Multifactor Authentication,

Multimedia Applications

CSE :22   **L-T-P: 3-1-0**

Unit-I

Multimedia Fundamentals: Define the concept of multimedia, fundamental criteria for the design of a multimedia presentation, multimedia application goals &objectives, opportunities in multimedia production, Role of multimedia development team members, avoiding problems in planning a multimedia application.

Unit-II

Multimedia Building Blocks: Text, Graphics, video capturing, Sound capturing, editing.

Basic design principle: proximity, visual hierarchy, Symmetry / Asymmetry, Repetition, unity, Contrast, dynamics, Emphasis, Multimedia Authoring tools.

Unit-III

Design, Development and evaluation of multimedia a system: The development of user interface design, Design Process,

Unit-IV

Multimedia & the Internet, Multimedia conferencing, Multimedia file sharing, Multimedia broadcasting, Multimedia file handling: Compression & Decompression, Data & file formats standard.

Reference Books:

John Villamil-Casanova, Louis Molina, An introduction to multimedia

Mohammad Dastbaz, Desgning Interactive Multimedia Systems

Bohdan O. Szuprowicz, Multimedia Networking

Stephen McGloughlin, Multimedia on the web

CLIENT SERVER COMPUTING

CSE : 23   **L-T-P: 3-1-0**

Unit I

Client/Server Computing: DBMS concept and architecture, Single system image, Client Server architecture, mainframe-centric client server computing, downsizing and client server computing, preserving mainframe applications investment through porting, client server development tools, advantages of client server computing.

Unit II

Components of Client/Server application: The client: services, request for services, RPC, windows services, fax, print services, remote boot services, other remote services, Utility Services & Other Services, Dynamic Data Exchange (DDE), Object Linking and Embedding (OLE), Common Object Request Broker Architecture (CORBA).

The server: Detailed server functionality, the network operating system, available platforms, the network operating system, available platform, the server operating system.

Unit III

Client/Server Network: connectivity, communication interface technology, Interposes communication, wide area network technologies, network topologies (Token Ring, Ethernet, FDDI, CDDI) network management, Client-server system development: Software, Client–Server System Hardware: Network Acquisition, PC-level processing unit, Macintosh, notebooks, pen, UNIX workstation, x-terminals, server hardware.

Unit IV

Client Server Systems Development: Services and Support, system administration, Availability, Reliability, Serviceability, Software Distribution, Performance, Network management, Help Disk, Remote Systems Management Security, LAN and Network Management issues. Training, Training advantages of GUI Application, System Administrator training, Database Administrator training, End-user training.

Unit V

Data Storage: magnetic disk, magnetic tape, CD-ROM, WORM, Optical disk, mirrored disk, fault tolerance, RAID, RAID-Disk network interface cards. Network protection devices, Power Protection Devices, UPS, Surge protectors.

The future of client server Computing Enabling Technologies, The transformational system.

Text Book:

1. Patrick Smith & Steave Guengerich, "Client / Server Computing", PHI

2. Dawna Travis Dewire, "Client/Server Computing", TMH

Reference Books:

3. Majumdar & Bhattacharya, "Database management System", TMH
4. Korth, Silberchatz, Sudarshan, "Database Concepts", McGraw Hill
5. Elmasri, Navathe, S.B, "Fundamentals of Data Base System", Addison Wesley

Soft Computing

CSE :24   **L-T-P: 3-1-0**

UNIT I FUZZY SET THEORY
Introduction to Neuro – Fuzzy and Soft Computing – Fuzzy Sets – Basic Definition and Terminology – Set-theoretic Operations – Member Function Formulation and Parameterization – Fuzzy Rules and Fuzzy Reasoning – Extension Principle and Fuzzy Relations – Fuzzy If-Then Rules – Fuzzy Reasoning – Fuzzy Inference Systems – Mamdani Fuzzy Models – Sugeno Fuzzy Models – Tsukamoto Fuzzy Models – Input Space Partitioning and Fuzzy Modeling.

UNIT II OPTIMIZATION
Derivative-based Optimization – Descent Methods – The Method of Steepest Descent – Classical Newton's Method – Step Size Determination – Derivative-free Optimization – Genetic Algorithms – Simulated Annealing – Random Search – Downhill Simplex Search.

UNIT III NEURAL NETWORKS
Supervised Learning Neural Networks – Perceptrons - Adaline – Backpropagation Mutilayer Perceptrons – Radial Basis Function Networks – Unsupervised Learning Neural Networks – Competitive LearningNetworks – Kohonen Self-Organizing Networks – Learning Vector Quantization – Hebbian Learning.

UNIT IV NEURO FUZZY MODELING
Adaptive Neuro-Fuzzy Inference Systems – Architecture – Hybrid Learning Algorithm – Learning Methods that Cross-fertilize ANFIS and RBFN – Coactive Neuro Fuzzy Modeling – Framework Neuron Functions for Adaptive Networks – Neuro Fuzzy Spectrum.

UNIT V APPLICATIONS OF COMPUTATIONAL INTELLIGENCE
Printed Character Recognition – Inverse Kinematics Problems – Automobile Fuel Efficiency Prediction – Soft Computing for Color Recipe Prediction.

TEXT BOOK
1. J.S.R.Jang, C.T.Sun and E.Mizutani, "Neuro-Fuzzy and Soft Computing", PHI, 2004, Pearson Education 2004.

REFERENCES
1. Timothy J.Ross, "Fuzzy Logic with Engineering Applications", McGraw-Hill, 1997.
2. Davis E.Goldberg, "Genetic Algorithms: Search, Optimization and Machine Learning", Addison Wesley, N.Y., 1989.
3. S. Rajasekaran and G.A.V.Pai, "Neural Networks, Fuzzy Logic and Genetic Algorithms", PHI, 2003.
4. R.Eberhart, P.Simpson and R.Dobbins, "Computational Intelligence - PC Tools", AP Professional, Boston, 1996.

Software Engineering

CS: 241   **L-T-P: 3-1-0**

Unit-I: Introduction
Introduction to Software Engineering, Software Components, Software Characteristics, Software Crisis, Software Engineering Processes, Similarity and Differences from Conventional Engineering Processes, Software Quality Attributes. Software Development Life Cycle (SDLC) Models: Water Fall Model, Prototype Model, Spiral Model, Evolutionary Development Models, Iterative Enhancement Models.

Unit-II: Software Requirement Specifications (SRS)
Requirement Engineering Process: Elicitation, Analysis, Documentation, Review and Management of User Needs, Feasibility Study, Information Modeling, Data Flow Diagrams, Entity Relationship Diagrams, Decision Tables, SRS Document, IEEE Standards for SRS. Software Quality Assurance (SQA): Verification and Validation, SQA Plans, Software Quality Frameworks, ISO 9000 Models, SEI-CMM Model.

Unit-III: Software Design
Basic Concept of Software Design, Architectural Design, Low Level Design: Modularization, Design Structure Charts, Pseudo Codes, Flow Charts, Coupling and Cohesion Measures, Design Strategies: Function Oriented Design, Object Oriented Design, Top-Down and Bottom-Up Design. Software Measurement and Metrics: Various Size Oriented Measures: Halestead's Software Science, Function Point (FP) Based Measures, Cyclomatic Complexity Measures: Control Flow Graphs.

Unit-IV: Software Testing
Testing Objectives, Unit Testing, Integration Testing, Acceptance Testing, Regression Testing, Testing for Functionality and Testing for Performance, Top-Down and Bottom-Up Testing Strategies: Test Drivers and Test Stubs, Structural Testing (White Box Testing), Functional Testing (Black Box Testing), Test Data Suit Preparation, Alpha and Beta Testing of Products. Static Testing Strategies: Formal Technical Reviews (Peer Reviews), Walk Through, Code Inspection, Compliance with Design and Coding Standards.

Unit-V: Software Maintenance and Software Project Management
Software as an Evolutionary Entity, Need for Maintenance, Categories of Maintenance: Preventive, Corrective and Perfective Maintenance, Cost of Maintenance, Software Re-Engineering, Reverse Engineering. Software Configuration Management Activities, Change Control Process, Software Version Control, An Overview of CASE Tools. Estimation of Various Parameters such as Cost, Efforts, Schedule/Duration, Constructive Cost Models (COCOMO), Resource Allocation Models, Software Risk Analysis and Management.

References:

1. R. S. Pressman, Software Engineering: A Practitioners Approach, McGraw Hill.
2. Rajib Mall, Fundamentals of Software Engineering, PHI Publication.
3. K. K. Aggarwal and Yogesh Singh, Software Engineering, New Age International Publishers.
4. Pankaj Jalote, Software Engineering, Wiley.
5. Carlo Ghezzi, M. Jarayeri, D. Manodrioli, Fundamentals of Software Engineering, PHI Publication.
6. Ian Sommerville, Software Engineering, Addison Wesley.
7. Kassem Saleh,"Software Engineering", Cengage Learning.
8. Pfleeger, Software Engineering, Macmillan Publication.

DATA WAREHOUSING AND DATA MINING

CS: 242   **L-T-P: 3-1-0**

UNIT-I
Introduction: What is Data Mining, Data Mining Functionalities, Classification of Data Mining Systems, Major Issues in Data Mining. Data Preprocessing: Needs Preprocessing, Descriptive Data Summarization, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization and Concept Hierarchy Generation.

UNIT-II
Data Warehouse and OLAP Technology: What is Data Warehouse, A Multidimensional Data Model, Data Warehouse Architecture and Implementation, from Data Warehousing to Data Mining.Mining Frequent Patterns, Associations Rules: Basic Concepts, Efficient and Scalable Frequent Item Set Mining Methods, Mining Various kinds of Association Rules.

UNIT-III
Classification and Prediction: Introduction, Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule based Classification, Classification by Back Propagation, Support Vector Machines, Prediction, Accuracy and Error Measures

UNIT-IV
Cluster Analysis: Introduction, Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid Based Methods, Model Based Clustering Methods, Outlier Analysis

UNIT—V
Mining Object, Spatial, Multimedia, Text, and Web Data: Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Data Mining, Multimedia Data Mining, Text Mining, Mining the World Wide Web.

Text Books:-

1) Han J &Kamber M, "Data Mining: Concepts and Techniques", Harcourt India, Elsevier India, Second Edition.
2) Pang-NingTan. MichaelSteinback,VipinKumar, "Introduction to Data Mining", Pearson Education, 2008.

Reference Books:
1) Margaret H Dunham,S.Sridhar, "Data mining: Introductory and Advanced Topics", Pearson Education, 2008.
2)Humphires,hawkins,Dy, "Data Warehousing: Architecture and Implementation", Pearson Education, 2009.
3)Anahory, Murray, "Data Warehousing in the Real World", PearsonEçiucation, 2008.
4)Kargupta,Joshi,etc., "Data Mining: Next Generation Challenges and Future Directions" Prentice Hall of IndiaPvtLtd, 2007.

Formal Language and Automata Theory

CS: 243   **L-T-P: 3-1-0**

UNIT-I
Introduction to formal proof – Additional forms of proof – Inductive proofs –Finite Automata (FA) – Deterministic Finite Automata (DFA) – Non-deterministic Finite Automata (NFA) – Finite Automata with Epsilon transitions.
UNIT-II
Regular Expression – FA and Regular Expressions – Proving languages not to be regular – Closure properties of regular languages – Equivalence and minimization of Automata**.**
UNIT-III
Context-Free Grammar (CFG) – Parse Trees – Ambiguity in grammars and languages – Definition of the Pushdown automata – Languages of a Pushdown Automata – Equivalence of Pushdown automata and CFG– Deterministic Pushdown Automata.
UNIT- IV

Normal forms for CFG – Pumping Lemma for CFL – Closure Properties of CFL – Turing Machines – Programming Techniques for TM.
UNIT- V
A language that is not Recursively Enumerable (RE) – An undecidable problem that is
RE – Undecidable problems about Turing Machine – Post's Correspondence Problem –
The classes P and NP.

TEXT BOOK:
1. J.E. Hopcroft, R. Motwani and J.D. Ullman, "Introduction to Automata Theory,
Languages and Computations", second Edition, Pearson Education, 2007.

REFERENCES:
1. H.R. Lewis and C.H. Papadimitriou, "Elements of the theory of Computation",
Second Edition, Pearson Education, 2003.
2. Thomas A. Sudkamp," An Introduction to the Theory of Computer Science,
Languages and Machines", Third Edition, Pearson Education, 2007.
3. Raymond Greenlaw an H.James Hoover, " Fundamentals of Theory of
Computation, Principles and Practice", Morgan Kaufmann Publishers, 1998.
4. Micheal Sipser, "Introduction of the Theory and Computation", Thomson
Brokecole, 1997.

Computer Graphics

CS: 244   **L-T-P: 3-1-0**

Unit –I
Overview of Graphics Systems – Video display devices, raster-scan systems. Random– scan system, graphics monitors and workstations. Input devices, Hardcopy devices, Graphics software. Output primitives: Line drawing algorithms, Circle generation algorithms, ellipse generating algorithms, pixel addressing, Filled area primitives, Fill area functions, cell array, character generations.

Unit –II
Attributes of output primitives: Line attributes, curve attributes color and Gray-scale level, Area fill attributes, character attributes, and Bundled attributes Enquiry functions. Two dimensional Geometric transformations: Basic transformations, Homogenous co-ordinates, affine transformations, transformation functions. Raster methods for transformations.

Unit – III
Two dimensional viewing: Viewing pipeline, viewing transformation, viewing functions, line clipping – Cohen Sutherland line clipping, Liang Barsky line clipping, polygon clipping: Sutherland – Hodgman polygon clipping, Wiler Athertion polygon clipping.

Unit – IV
Structures and Hierarchical Modeling: Structure concepts, editing structures, Basic modeling concepts, hierarchical modeling with structures. Graphical user interfaces and Interactive input methods: The user Dialogue, logical classification of input devices, Input functions and Models Interactive picture construction techniques.

Unit – V
Three – Dimensional object representations: Polysurfaces curved lines and surfaces, spline representation, Bezier curves and surfaces, B-Spline curves and surface, CSG Methods: Octrees, BSP Trees. Three Dimensional Transformation : Three dimensional viewing: Viewing coordinates, projections, Visible surface detection methods: Back-face Detection, Depth-buffer methods, scan line methods, Depth-sorting methods, BSP – Tree Methods, Arc sub division methods, Basic illuminations models – Gourand shading phong shading.

Suggested Reading:

1. Heanry Donald, Pauline Baker M: Computer Graphics, PIH 2nd edn., 1995.

2. Harrington S: Computer Graphics A Programming Approach 2nd Edn. McGraw Hill,1987.

UML LAB

1. Identify Use Cases and develop the Use Case model.
2. Identify the business activities and develop an UML Activity diagram.
3. Identity the conceptual classes and develop a domain model with UML Class diagram.
4. Using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.
5. Draw the State Chart diagram.
6. Identify the User Interface, Domain objects, and Technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
7. Implement the Technical services layer.
8. Implement the Domain objects layer.
9. Implement the User Interface layer.
10. Draw Component and Deployment diagrams.

Suggested domains for Mini-project/Case Studies.

1. Library management system
2. Hospital management system
3. ATM system
4. Transport System
5. Passport automation system.
6. Book bank System
7. Exam Registration System
8. Stock maintenance system.
9. Online course reservation system
10. E-ticketing System
11. Software personnel management system
12. Credit card processing
13. e-book management system
14. Recruitment system
15. Foreign trading system
16. Conference Management System
17. BPO Management System

Linux Programming

Lab

CSL 47:   **L-T-P: 0-0-4**

UNIT I
Introduction – Short History - Why is Linux So Successful?- UNIX Flavors - BSD, SysV, Linux - Standards - System Architecture - The Kernel - The Shell - Utilities - Tools and Applications - **Linux Programming Security** – Users and Groups - PUID & PGID - Real and Effective IDs - Authenticating Users - File System Permissions.

UNIT II
Programming under Linux- Privileged Execution Mode - Kernel Mode Vs. User Mode - Systemcalls
Files - Using Files - Using Links - Working With Directories - Obtaining File Information - File Permissions - Special Permissions – **Signals** - The Way the Kernel Handles Signal - Types of Signals - Results of a Process - Receiving a Signal - Handling Signals - Signals List - Sending Signals - Handling Signals - Response to Signals - Activation of pause, signal - System Call for Signal Handling - Error Handler.

UNIT III
Process - Programs and Processes - The Process IDs - The Process Table - The Process State PS - Report - Process Status - Context Switch - The Process Environment - Process Group - Job and Processes - Process Termination - Creating a New Process - The wait Function Family - Executing a Program - The system C Library Function - Redirection of Input and Output - The vfork System Call.

UNIT IV
Threads - Thread Creation - Thread Cancellation - Thread-Specific Data Synchronization and Critical Sections - GNU/Linux Thread Implementation - Processes Vs. Threads - **Inter-Process communication (IPC)** - Pipes - Named Pipes - Shared Memory - Message Queue - csh Level commands - **Synchronization Mechanisms** - File locking - Semaphore.

UNIT V
Sockets - What Is A Socket? - A Brief History Of Sockets - Communication Protocols - communication Capabilities - Endpoint Addresses - The Internet Protocol (IP) - Internet Addresses - Address Classes - Connection Oriented Communications And TCP - Connectionless communications And UDP - Stream Sockets - The Basic Model - Sending Data(send) - Receiving Data(recv.) - Shutting Down A Socket - Related files - The select( ) System Call - Broadcast and Datagram Sockets

TEXT BOOKS:

1. Beginning Linux Programming, 4th Edition, N.Matthew, R.Stones,Wrox, Wiley India Edition.
2. Unix for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson Education, 2003.

REFERENCE BOOKS:
1. Unix Network Programming ,W.R.Stevens, PHI.
2. Unix for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson Education.

DISTRIBUTED SYSTEMS

CSE : 41   **L-T-P: 3-1-0**

Unit–I

Characterization of Distributed Systems: Introduction, Examples of distributed Systems, Resource sharing and the Web Challenges. Architectural models, Fundamental Models.
Theoretical Foundation for Distributed System: Limitation of Distributed system, absence of global clock, shared memory, Logical clocks, Lamport's & vectors logical clocks. Concepts in Message Passing Systems: causal order, total order, total causal order, Techniques for Message Ordering, Causal ordering of messages, global state, termination detection.

Unit-II

Distributed Mutual Exclusion: Classification of distributed mutual exclusion, requirement of mutual exclusion theorem, Token based and non token based algorithms, performance metric for distributed mutual exclusion algorithms. Distributed Deadlock Detection: system model, resource Vs communication deadlocks, deadlock prevention, avoidance, detection & resolution, centralized dead lock detection, distributed dead lock detection, path pushing algorithms, edge chasing algorithms.

Unit–III

Agreement Protocols: Introduction, System models, classification of Agreement Problem, Byzantine agreement problem, Consensus problem, Interactive consistency Problem, Solution to Byzantine Agreement problem, Application of Agreement problem, Atomic Commit in Distributed Database system. Distributed Resource Management: Issues in distributed File Systems, Mechanism for building distributed file systems, Design issues in Distributed Shared Memory, Algorithm for Implementation of Distributed Shared Memory.

Unit–IV

Failure Recovery in Distributed Systems: Concepts in Backward and Forward recovery, Recovery in Concurrent systems, Obtaining consistent Checkpoints, Recovery in Distributed Database Systems. Fault Tolerance: Issues in Fault Tolerance, Commit Protocols, Voting protocols, Dynamic voting protocols.

Unit –V

Transactions and Concurrency Control: Transactions, Nested transactions, Locks, Optimistic Concurrency control, Timestamp ordering, Comparison of methods for concurrency control.
Distributed Transactions: Flat and nested distributed transactions, Atomic Commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery.
Replication: System model and group communication, Fault - tolerant services, highly available services, Transactions with replicated data.

References:
1. Singhal & Shivaratri, "Advanced Concept in Operating Systems", McGraw Hill
2. Ramakrishna,Gehrke," Database Management Systems", Mc Grawhill
3. Coulouris, Dollimore, Kindberg, "Distributed System: Concepts and Design", Pearson

Education
4. Tenanuanbaum, Steen," Distributed Systems", PHI
5. Gerald Tel, "Distributed Algorithms", Cambridge University Press

Software Testing and Quality Assurance

CSE : 42   **L-T-P: 3-1-0**

Unit-I

Introduction: Software Quality, Role of testing, v & v, objectives and issues of testing, Testing activities and levels, Sources of Information for Test Case Selection, White-Box and Black-Box Testing , Test Planning and Design, Monitoring and Measuring Test Execution, Test Tools and Automation, Test Team Organization and Management. Unit Testing: Concept, Static Unit Testing, Defect Prevention, Dynamic Unit Testing, Mutation Testing, Debugging.

Unit-II

Control Flow & Data Flow Testing: Outline of CFT, CF Graph, Paths in a Control Flow Graph, Path Selection Criteria,Generating Test Input, Examples of Test Data Selection. Overview of Dynamic Data Flow Testing, Data Flow Graph, Data Flow Testing Criteria, Comparison of Testing Techniques.

Unit-III

System Integration Testing & Test Design: Concept of Integration Testing, Different Types of Interfaces and Interface Errors, Granularity of System Integration Testing, System Integration Techniques, Test Plan for System Integration,Off-the-Shelf Component Testing, System Test Categories.

Unit-IV

System Test Planning, Automation & Execution: Structure of a System Test Plan, Test Approach, Test Suite Structure, Test Environment, Test Execution Strategy, Test Effort Estimation, Scheduling and Test Milestones, System Test Automation, Selection of Test Automation Tools, Test Selection Guidelines for Automation, Structure of an AutomatedTest Case, Test Automation Infrastructure Metrics for Tracking System Test, Metrics for Monitoring Test Execution,Beta Testing, System Test Report, Measuring Test Effectiveness. Acceptance Testing:

Unit-V

Software Quality: Five Views of Software Quality, McCall's Quality Factors and Criteria,

Quality Factors Quality Criteria, Relationship between Quality Factors and Criteria, Quality Metrics, ISO 9126 Quality Characteristics, ISO 9000:2000 Software Quality Standard ISO 9000:2000 Fundamentals, ISO 9001:2000 Requirements

Text Book

1. Software Testing and Quality Assurance theory and practice byKshiraSagar Naik and Priyadarshi Tripathy

Reference Book

1. Stephen H.Khan ,Metrics and Models in Software Quality Engineering Pearson Education,India
2. Shari Lawrence Pfleeger,"Software Engineering Theory and Practice Pearson Education,India.

Software Project Management

CSE : 43   **L-T-P: 3-1-0**

Unit 1

Introduction: Project Management concepts, Process Framework, Project Planning Software Life Cycle Models, Artifacts of the Project Management Process.

Unit 2

Cost and Scheduling Estimation Models: Various Levels of COCOMO for Cost , Effort, Schedule and Productivity Estimation. Approaches to Effort, Cost Estimation, and Schedule Estimation factors through COCOMO II, Putnam Estimation Model, Algorithmic models.

Unit 3

Project Management Techniques: Project Organizations and Responsibilities, Establishing Project Environment, Risk Management Process, Project Tracking and Control Defect Tracking Concepts such as Process monitoring and audit, Reviews, Inspections and Walkthroughs.

Unit 4

Activity Planning including CPM and PERT: Network planning model; Activity-on-arrow network; Precedence network; Forward pass; Backward pass; Critical path; Slack and float.

Unit 5

Risk Estimation: What is Risk?, Framework for Managing Risks, Risk Identification, Risk Analysis and Prioritization, Risk Avoidance and Mitigation Strategies, Risk Monitoring, Estimating.

Suggested Readings:-
   Text Books:
      1. Watts S. Humphrey, "Managing the Software Process", Pearson Education
      2. Walker Royce, "Software Project Management", Pearson Education.
      3. Pankaj Jalote, "Software Project Management in Practice", Pearson Education.
Reference Books:
      1. Bob Hughes, "Software Project Management", TMH.
      2. Chris Kemerer, "Software Project Management Readings and Cases".regards

COMPILER DESIGN

CSE : 44   **L-T-P: 3-1-0**

UNIT I

Formal Language and Regular Expressions: Languages, Definition Languages regular expressions, Finite Automata – DFA, NFA. Conversion of regular expression to NFA, NFA to DFA. Applications of Finite Automata to Compiler Construction- lexical analysis, Construction of lexical analyze using LEX tool. Phases of Compilation and A simple One-Pass Compiler.

UNIT II

Context Free grammars and parsing: Context free grammars, derivation, parse trees, ambiguity, Application CFG in compilation-Preprocessing steps in Parsing, LL(1) parsing. Bottom up parsing handle pruning LR Grammar Parsing, LALR parsing, parsing ambiguous grammars, YACC programming specification.

UNIT III

Semantics: Syntax directed translation, S-attributed and L-attributed grammars, Intermediate code – abstract syntax tree, translation of simple statements and control flow statements. Context Sensitive features – Chomsky hierarchy of languages and recognizers. Type checking, type conversions, equivalence of type expressions, overloading of functions and operations.

UNIT IV

Run time storage: Storage organization, storage allocation strategies scope access to now local names, parameters, language facilities for dynamics storage allocation. Code optimization: Principal sources of optimization, optimization of basic blocks, peephole optimization

UNIT V

Global optimizations-flow graphs, Data flow analysis of flow graphs. Code generation: Machine dependent code generation, object code forms, generic code generation algorithm, Register allocation and assignment. Using DAG representation of Blocks.

TEXT BOOKS:

1. Compilers Principles, Techniques and Tools Aho, Ullman, Ravisethi, Pearson Education.

2. Introduction to Automata Theory, Languages and Computation - Hopcroft, Rajeev Motwani and Ullman, 3rd Edition, Pearson Education.

REFERENCE BOOKS:

1. Introduction to Theory of computation.Sipser, 2nd Edition, Cengage Learning.

2. Introduction to Formal Languages and Automata Theory and Computation – Kamala Krithivasan and Rama R, Pearson.

3. Modern Compiler Construction in C, Andrew W.Appel Cambridge University Press.

4. Compiler Construction, Louden, Cengage Learning, 1997.

5. Elements of Compiler Design, A.Meduna, Auerbach Publications, Taylor and Francis Group.

6. Principles of Compiler Design, V.Raghavan, TMH.

7. Engineering a Compiler, K.D.Cooper, L.Torczon, ELSEVIER.

8. Principles of Compiler Design, N.Prasad K.S, ELSEVIER.

Cloud Computing and Virtualization

CS: 351   **L-T-P: 3-1-0**

UNIT I
Cloud Computing Fundamentals:
Cloud Computing definition, Types of cloud, Cloud services: Benefits and challenges of cloud computing, Evolution of Cloud Computing , Applications cloud computing, Business models around Cloud – Major Players in Cloud Computing - Issues in Cloud - Eucalyptus - Nimbus - Open Nebula, CloudSim.

UNIT II
Cluster Computing, Grid Computing, Grid Computing Versus Cloud Computing, Key Characteristics of Cloud Computing. Cloud Models: Benefits of Cloud Models, Public Cloud, Private Cloud, Hybrid Cloud, Community Cloud, Shared Private Cloud, Dedicated Private Cloud, and Dynamic Private Cloud.

UNIT III
Cloud Services and File System:
Types of Cloud services: Software as a Service - Platform as a Service – Infrastructure as a Service - Database as a Service- Monitoring as a Service – Communication as services. Service providers- Google App Engine, Amazon EC2, Microsoft Azure, Sales force.

UNIT IV
Virtualization:
Basics of Virtualization - Types of Virtualization - Implementation Levels of Virtualization - Virtualization Structures - Tools and Mechanisms - Virtualization of CPU, Memory, I/O Devices - Virtual Clusters and Resource management – Virtualization for Data-center Automation. Introduction to MapReduce, GFS, HDFS, Hadoop Framework.

UNIT V
Security in the Cloud:
Security Overview – Cloud Security Challenges and Risks – Software-as-a-Service Security – Security Monitoring – Security Architecture Design – Data Security – Application Security – Virtual Machine Security - Identity Management and Access Control – Autonomic Security.

REFERENCES:
- Cloud Computing ”A Practical Approach” Anthony T. Velte, Toby J. Velte, Robert Elsenpeter. McGraw-Hill.
- Kai Hwang, Geoffrey C Fox, Jack G Dongarra, “Distributed and Cloud Computing, From Parallel Processing to the Internet of Things”, Morgan Kaufmann Publishers, 2012.
- John W.Rittinghouse and James F.Ransome, “Cloud Computing: Implementation, Management, and Security”, CRC Press, 2010.
- Toby Velte, Anthony Velte, Robert Elsenpeter, “Cloud Computing, A Practical Approach”, TMH, 2009.
- Kumar Saurabh, “ Cloud Computing – insights into New -Era Infrastructure”, Wiley India,2011.

- Ronald L. Krutz, Russell Dean Vines, "Cloud Security – A comprehensive Guide to Secure Cloud Computing", Wiley – India, 2010.

Web Technology

CS: 352   **L-T-P: 3-1-0**

UNIT I

HTML – What is HTML – Basic Structure of HTML Page – Basic Tags – Types of Tags – Lists – Tables – Images – Forms – Frames.

UNIT II

Dynamic HTML with Java Script: Data validation, Opening a new window, Messages and Confirmations, The status bar, Writing to a different frame, Rollover buttons, Moving images, Multiple pages in a single download, A text-only menu system, Floating logos.

UNIT III

Cascading Style Sheet – Introduction – A Simple Specification – Types of Style Sheets – Inline Style Sheets – Internal or embedded style sheets – External Style Sheets – Style Classes – Font Properties – Background properties – Border properties – text properties – margin properties – padding properties – table properties – positioning properties – line/marker properties – outlines – classification.

UNIT IV

JAVA SCRIPT – Introduction – Usage of variables – operations – control structures – looping structures – predefined keywords – arrays – predefined functions – user defined functions – arrays and functions – mathematical functions – string functions – objects – expressions –pattern matching using RegEXp Class – String Class – Exception Handling – Built–in objects – Bgcolor/Fgcolor – Date Object – Events and Event Handling – Validations – Window – Confirmation, alert messages.

UNIT V

XML –Introduction –Document Type Definition or DTD – uses of DTD – Tags – Elements – Attributes – PCDATA – CDATA – Basics of entities – XML Elements – Elements Declaration –usage of #REQUIRED – usage of #IMPLIED – usage of #FIXED – Internal Entities – External Entities – XML Schema – Defining, Accessing XML Document.

Prescribed Book:

1. Chris Bates, Web Programming Building Internet Applications, Second Edition, Wiley (2007)

Reference Books:

1. Paul S.Wang Sanda S. Katila, An Introduction to Web Design Plus Programming, Thomson(2007).

2. Robert W.Sebesta, Programming the World Wide Web, Third Edition, Pearson Education (2007).
3. Thomas A.Powell, The Complete Reference HTML & XHTML, Fourth Edition, Tata McGraw Hill (2006).
4. Abders Moller and Michael Schwartzbach, An Introduction to XML and Web Technologies, Addison Wesley (2006).
5. Joel Sklar, Principles of Web Design, Thomson (2007).
6. Raj Kamal, Internet and Web Technologies, Tata McGraw Hill (2007).

CRYPTOGRAPHY AND NETWORK SECURITY

CS: 353   **L-T-P: 3-1-0**

Unit-I
Introduction to security attacks, services and mechanism, introduction to cryptography. Conventional Encryption: Conventional encryption model, classical encryption techniques-substitution ciphers and transposition ciphers, cryptanalysis, stenography, stream and block ciphers. Modern Block Ciphers: Block ciphers principals, Shannon's theory of confusion and diffusion, fiestal structure, data encryption standard(DES), strength of DES, differential and linear cryptanalysis of DES, block cipher modes of operations, triple DES.

Unit-II
Introduction to graph, ring and field, prime and relative prime numbers, modular arithmetic, Fermat's and Euler's theorem, primality testing, Euclid's Algorithm, Chinese Remainder theorem, discrete logarithms. Principals of public key crypto systems, RSA algorithm, security of RSA, key management, Diffle-Hellman key exchange algorithm, introductory idea of Elliptic curve cryptography, Elgamel encryption.

Unit-III
Message Authentication and Hash Function: Authentication requirements, authentication functions, message authentication code, hash functions, birthday attacks, security of hash functions and MACS, MD5 message digest algorithm, Secure hash algorithm(SHA). Digital Signatures: Digital Signatures, authentication protocols, digital signature standards (DSS), proof of digital signature algorithm.

Unit-IV
Authentication Applications: Kerberos and X.509, directory authentication service, electronic mail security-pretty good privacy (PGP), S/MIME.

Unit-V
IP Security: Architecture, Authentication header, Encapsulating security payloads, combining security associations, key management.
Web Security: Secure socket layer and transport layer security, secure electronic transaction (SET). System Security: Intruders, Viruses and related threads, firewall design principals, trusted
systems.

Refernces:
1. William Stallings, "Cryptography and Network Security: Principals and Practice", Prentice Hall, New Jersy.
2. Johannes A. Buchmann, "Introduction to Cryptography", Springer-Verlag.
3. Bruce Schiener, "Applied Cryptography".
4. Behrouz A. Forouzan, "Cryptography and Network Security",

Artificial Intelligence

CS: 354   **L-T-P: 3-1-0**

UNIT I:

AI History and Applications: Defining AI: Acting Humanly (Turing Test Approach), Thinking Humanly(Cognitive Modeling Approach), Thinking Rationally (laws of thought approach), Acting Rationally(Rational Agent Approach); Foundations of Artificial Intelligence; History of AI, AI techniques, Expert Systems.

UNIT II:

Problem Solving by Search: Defining the problem as a State Space Search Strategies: Breadth – first Search, Depth- first search, Depth limited search , Iterative Depending depth first search. **Heuristic Search Techniques:** Hill Climbing, Simulated Annealing, Best First Search: OR Graphs, Heuristic Functions, A* Algorithm, AND –OR graphs, AO* Algorithm.

UNIT III:

Knowledge Representation: Representations and mappings, Approaches to knowledge Representation, Procedural versus Declarative knowledge; **Predictive Logic:** Representing Simple facts, Instance and Isa relationships in Logic, Proposition versus Predicate Logic, Computable Functions and Predicates- not, Rules of Inferences and Resolution-not, Forward versus Backward Reasoning, Logic Programming and Horn Clauses. **Weak slot and Filler Structure:** Semantic Nets, Frames. **Strong slot Filler Structures:** Conceptual Dependency, scripts.

UNIT IV:

AI **Progrmming Languages(PROLOG):** Introduction, How Prolog works, Backtracking, CUT and FAIL operators, Built –in Goals, Lists, Search in Prolog.

UNIT V:

Connectionist Models / ANN: Foundations for Connectionist Networks, Biological Inspiration; Different Architectures and output functions: Feed forward, Feedback, Recurrent Networks, step, Sigmoid and different functions.

TEXT BOOK:

Stuart Russel and Peter Norvig: Artificial Intelligence – A Modern Approach, 2nd Edition Pearson Education

REFERENCE:

Elaine Rich and Kevin Knight: Artificial Intelligence, Tata McGraw Hill 2nd Ed.

N.P. padhy: Artificial Intelligence and Intelligent Systems, Oxford Higher Education, Oxford University Press

George F Luger: Artificial Intelligence- Structures and Strategies for complex Problem Solving, 4th Ed. Pearson Education

Ivan Bratko :PROLOG Programming 2nd Ed., Pearson Education

Web Technology lab

Lab

list of Experiments

1.   Write HTML code to use the tags like caption, title, body etc.
2.   Write HTML code to divide the screen into multiple frames.
3.   Write HTML code to link the pages and display the images.
4.   Write HTML code to create a table
5.   Write HTML code for form and place some text boxes, command box, selection box etc on the form.
6.   Write a small program using XML.
7.   Write a Java Script for displaying message, time and date etc using document write method.
8.   Write a Java Script for displaying different buttons (Ex: ok, cancel etc), different icons (ex: question, critical etc) and different boxes (input box, message box etc)
9.   Write a Java Script Script to extract month, year, day from current date.
10.   Write a Java Script Script to extract hour, minute and seconds from current time.
11.   Write a Java Script to calculate simple interest and compound interest using arithmetic operators.
12.   Write programs on string. (Ex: Accepting a string, calculating the position of the character in the string, Length of the string etc)
13.   Write programs to work with radio buttons and checkbox.
14.   Write ASP code to display current date and time.
15.   Write a program to pass the values to the next page using Submit button in ASP.
16.   Write a program to establish the connection with the database and populating values in the combo box.
17.   Write a program to display all the records in the table.
18.   Write a program to insert the record into the table.
19.   Write a program to display a registration form.
20.   Write a program to store the data in the table.
21.   Write PHP code to display date and time.
22.   Write PHP code to create a form through which data can be uploaded into automated system.
23.   Write PHP code to create a cookie.
24.   Write PHP code to create a table and insert records into it.
25.   Design your CS and IT website, install it and maintain it.

REFERENCES BOOKS

1.   Internet & World Wide Web –   Dietel and Dietel Pearson
                                                                    education Asia.
2.   Principles of Web Design   Sklar TMH
3.   HTML complete reference   Powell – THH.
4.   WWW Design with HTML   Xavier (TMH)
5.   Basics of Web Site Design   NIIT – PHI

6.	Straight to the point PHP	Laxmi Publications
7.	The Web Warrior Guide to Web Design	Gosselin, Thomson
8.	Web Technology & Design	C Xavier, New Age Inter.

AI Lab

CSL: 57   **L-T-P: 0-0-4**

Write a program to demonstrate Inference Concept in Prolog.

Write a program to implement and check Car DataBase system.

Write a program on External Goal.

Write a program on internal Goal.

Write a program for testing the Graph.

Write a program on FAIL predicate to find all Solutions.

Write a program on Recursion to print a set of numbers.

Write a program to process List with Header.

Write a program on Exclusion using FAIL predicate.

Write a program on List processing with fail predicate.

Write a program to implement Login mechanism without recursion.

Write a program to implement Login mechanism with Repeat Predicate.

Write a program to implement Login mechanism without repeat predicate with recursion.

Write a program to test whether an element is a member of list or not.

Write a program on CUT predicate to prevent backtracking.

Write a program addition of two integers using built-in predicates.

Write a program to find square root of a number.

Write a program comparison operators.

Write a program to implement simple Counter.

Write a program to generate Random Numbers.

SOFTWARE AGENTS

UNIT I SOFTWARE AGENTS PARADIAGM

Software agent, history, theoretical foundations for software agents, agent programming, agent programming paradigms, agent vs. object, aglet, mobile agents, agent frameworks, agent reasoning, agent applications.

UNIT II AGENT TYPOLOGY

Software agents: collaborative agents, interface agents, mobile agents, information agents, reactive agents, hybrid agents, heterogeneous agent system, smart agents.

UNIT III MULTIAGENT SYSTEMS

Multiagent system, interaction between agents, reactive agents, cognitive agents, interaction protocols, agent coordination, agent negotiation, agent cooperation, agent organization, self- interested agents in ecommerce applications.

UNIT IV INTELLIGENT SOFTWARE AGENTS

Design and implementation of intelligent agents: reactive, deliberative, planning, interface agents, agent communication languages, agent knowledge representation, agent adaptability, mobile agent applications, languages & tools for design, implementation of intelligent agents.

UNIT V AGENTS AND SECURITY

Agent security issues, mobile agents security, protecting agents against malicious hosts, untrusted agent, black box security, authentication for agents, security issues for aglets.

Reference Books:

1. Constructing Intelligent Agents with JAVA, Bigus & Bigus, Wiley, 1997.

2. Software Agents, Bradshaw, MIT Press, 2000.

3. Artificial Intelligence: A Modern Approach, von Stuart J. Russell, Peter Norvig, Prentice Hall, 1994.

4. Intelligent Software Agents, Richard Murch, Tony Johnson, Prentice Hall, 2000.

CSE52: ADVANCED COMPUTER NETWORK

CSE : 52   **L-T-P: 3-1-0**

UNIT I

Internetworking, IP Addressing, Subnetting, IP, Address resolution problem, ARP, RARP, Internet control and message Protocols,

UNIT II

Network layer level protocols, Transport layer protocols, Sockets, Client/server computing, Routing and routing protocols, dynamic host configuration DHCP,

UNIT III

Multicasting and group management, domain name systems, Issues of Multimedia Networking,

UNIT IV

Application protocols, network address translation, virtual private networks, proxy servers, issues of Network programming, IPv6, Network performance analysis,

UNIT V

High Performance Networks, any relevant topic decided by teacher, Network management, topics of current research.

TEXT BOOKS:

1. Forouzan, "TCP/IP Protocol Suite", Tata McGraw Hill.
2. Walrand & Varaiya,"High Performance Communication Networks", 2/e, Elsevier", 2003.

REFERENCE BOOKS:

1. Youlu Zheng / Shakil Akhtar, "Networks for Computer Scientists and Engineers", Oxford University Press
2. James D. McCabe, "Network Analysis, Architecture & Design, 2/e, Elsevier India", 2004.

SOFTWARE QUALITY ASSURANCE AND ENGINEERING

CSE : 53   **L-T-P: 3-1-0**

UNIT I SOFTWARE QUALITY AND ENGINEERING

Quality concepts and productivity relationship, software quality factors, software quality costs, Total Quality Management (TQM), continuous improvement cycle: Plan, Do, Check and Act (PDCA), quality policy, cost of quality, quality engineering, quality planning: goal setting and strategy formation, assessment and improvement.

UNIT II SOFTWARE QUALITY ASSURANCE (SQA)

Components of SQA, classification, defect detection, defect prevention, defect reduction, defect containment, QA activities in software processes, verification and validation, software review, inspection, formal verification, statistical software quality approach.

UNIT III COMPONENTS MEASUREMENT WITH REFERENCE TO SQA

Metrics, product quality metrics, process quality metrics, metrics for software maintenance, quality tools for quality control, test management and organizational structures, Capability Maturity Model (CMM), Capability Maturity Model Integration (CMMI), ISO 9000, quality and quality management metrics, Deming‟s Principle, SQA team formation

UNIT IV QUALITY MANAGEMENT MODEL

Integrating quality activities in project life cycle, reviews, software testing, strategies and implementation, Computer-Aided Software Engineering (CASE) tools, The Rayleigh model framework, code integration pattern, Problem Tracking Report (PTR), reliability growth model, Service Quality, Kano Model, Customer retention, continuous process improvement, Juran‟s Trilogy, TQM principles, Kaizen Technique, Statistical Quality Assurance, Mc call quality factors

UNIT V SOFTWARE QUALITY ASSURANCE BEYOND TESTING

Defect prevention and process improvement, root cause analysis for defect prevention, software inspection, inspection related activit ies, fault tolerance and failure containment, comparing quality assurance techniques and activities.

Reference Books:

1. Metrics and Models in Software Quality Engineering, Stephan H. Kan, Pearson Education, 2007.

2. An Integrated Approach to Software Engineering, Pankej Jalote, Narosa Publishing House, New Delhi 1997.
3. Making Sense of Software Quality Assurance, Raghav J. Nandyal, Tata McGRAW Hill, 2007.

DISTRIBUTED DATABASE

CSE : 54   **L-T-P: 3-1-0**

UNIT-I
Transaction and schedules, Concurrent Execution of transaction, Conflict and View Serializability, Testing for Serializability, Concepts in Recoverable and Cascadeless schedules.

UNIT –II
Lock based protocols, time stamp based protocols, Multiple Granularity and Multiversion Techniques, Enforcing serializablity by Locks, Locking system with multiple lock modes, architecture for Locking scheduler.

UNIT III

Distributed Transactions Management, Data Distribution, Fragmentation and Replication Techniques, Distributed Commit, Distributed Locking schemes, Long duration transactions, Moss Concurrency protocol.

UNIT –IV
Issues of Recovery and atomicity in Distributed Databases, Traditional recovery techniques, Log based recovery, Recovery with Concurrent Transactions, Recovery in Message passing systems, Checkpoints, Algorithms for recovery line, Concepts in Orphan and Inconsistent Messages.

UNIT V
Distributed Query Processing, Multiway Joins, Semi joins, Cost based query optimization for distributed database, Updating replicated data, protocols for Distributed Deadlock Detection, Eager and Lazy Replication Techniques.

References
1. Silberschatz, orth and Sudershan, Database System Concept', Mc Graw Hill
2. Ramakrishna and Gehrke,' Database Management System, Mc Graw Hill
3. Garcia-Molina, Ullman,Widom,' Database System Implementation' Pearson Education
4. Ceei and Pelagatti,'Distributed Database', TMH
5. Singhal and Shivratri, 'Advance Concepts in Operating Systems' MC Graw Hill