



GOVERNMENT DEGREE COLLEGE, NAGARI(A), CHITTOOR DT

(Accredited by NAAC with A+ Grade, CGPA: 3.28)

DEPARTMENT OF COMPUTER SCIENCE



I -SEMESTER

Paper Code:

1-03-EMPC01-R24

COURSE 1: ESSENTIALS AND APPLICATIONS OF MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

Hours: 5hrs/week

Credits: 4

Course Objective:

The objective of this course is to provide students with a comprehensive understanding of the essential concepts and applications of mathematical, physical, and chemical sciences. The course aims to develop students' critical thinking, problem-solving, and analytical skills in these areas, enabling them to apply scientific principles to real world situations.

Learning outcomes:

1. Apply critical thinking skills to solve complex problems involving complex numbers, trigonometric ratios, vectors, and statistical measures.
2. To Explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to Connect their knowledge of physics to everyday situations
3. To Explain the basic principles and concepts underlying a broad range of fundamental areas of Statistics and to Connect their knowledge of Statistics to daily life.
4. Understand the interplay and connections between mathematics, physics, and Statistics in various applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.
5. To explore the history and evolution of the Internet and to gain an understanding of network security concepts, including threats, vulnerabilities, and countermeasures.

UNIT I: ESSENTIALS OF MATHEMATICS: 9hrs

Trigonometric Ratios: Trigonometric Ratios and their relations – Problems on calculation of angles Vectors: Definition of vector addition – Cartesian form – Scalar and vector product and problems Statistical Measures: Mean, Median, Mode of a data and problems

UNIT II: ESSENTIALS OF PHYSICS: 9hrs

Definition and Scope of Physics- Measurements and Units - Motion of objects: Newtonian Mechanics and relativistic mechanics perspective - Laws of Thermodynamics and Significance- Acoustic waves and electromagnetic waves- Electric and Magnetic fields and their interactions- Behaviour of atomic and nuclear particles- Wave-particle duality, the uncertainty principle- Theories and understanding of universe

UNIT III: ESSENTIALS OF CHEMISTRY: 9hrs

Definition and Scope of Chemistry- Importance of Statistics in daily life -Branches of Chemistry and significance- Periodic Table- Electronic Configuration, chemical changes, classification of matter, Biomolecules- carbohydrates, proteins, fats and vitamins.

UNIT IV: APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY: 9hrs

Applications of Mathematics in Physics & Chemistry: Calculus, Differential Equations.

Application of Physics in Industry and Technology: Electronics and Semiconductor Industry, Robotics and Automation, Sustainable Technologies.

Application of Statistics in Industry and Technology: Chemical Manufacturing, Materials Science, Food and Beverage Industry.

UNIT V: ESSENTIALS OF COMPUTER SCIENCE: 9hrs

Milestones of computer evolution - Internet, history, Internet Service Providers, Types of Networks, Internet protocol, Internet Protocol Address(IPV4).

Ethical and social implications: Network and security concepts Fundamentals.

Cryptography-Symmetric and Asymmetric, Malware, Firewalls, Fraud Techniques in Networks.

Recommended books:

1. Functions of one complex variable by John B. Conway, Springer-Verlag.
2. Elementary Trigonometry by H.S. Hall and S.R. Knight
3. Vector Algebra by A.R. Vasishtha, Krishna Prakashan Media (P) Ltd.
4. Basic Statistics by B.L. Agarwal, New Age International Publishers
4. University Physics with Modern Physics by Hugh D. Young and Roger A. Freedman
5. Fundamentals of Physics by David Halliday, Robert Resnick, and Jearl Walker
6. Physics for Scientists and Engineers with Modern Physics" by Raymond A. Serway and John W. Jewett Jr.
7. Physics for Technology and Engineering" by John Bird
8. Chemistry in daily life by Kirpal Singh
9. Chemistry of biomolecules by S.P. Bhutan
10. Fundamentals of Computers by V. Raja Raman
11. Cyber Security Essentials by James Graham, Richard Howard, Ryan Olson



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DEPARTMENT OF COMPUTER SCIENCE



I Semester Paper Code: 1-03-AMPC02-R24

Course2:ADVANCES IN MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

Hours:5 hrs/week

Credits:4

Course Objective:

The objective of this course is to provide students with an in-depth understanding of the recent advances and cutting-edge research in mathematical, physical, and chemical sciences. The course aims to broaden students' knowledge beyond the foundational concepts and expose them to the latest developments in these disciplines, fostering critical thinking, research skills, and the ability to contribute to scientific advancements.

Learning outcomes:

1. Explore the applications of mathematics in various fields of physics and chemistry, to understand how mathematical concepts are used to model and solve real-world problems.
2. To Explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to Connect their knowledge of physics to everyday situations.
3. Understand the different sources of renewable energy and their generation processes and advances in nanomaterials and their properties, with a focus on quantum dots. To study the emerging field of quantum communication and its potential applications. To gain an understanding of the principles of biophysics in studying biological systems. Explore the properties and applications of shape memory materials..
4. Understand the principles and techniques used in computer-aided drug design and drug delivery systems, to understand the fabrication techniques and working principles of nano sensors. Explore the effects of chemical pollutants on ecosystems and human health. Understand the interplay and connections between mathematics, physics, and chemistry in various advanced applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.
5. Understand and convert between different number systems, such as binary, octal, decimal, and hexadecimal. Differentiate between analog and digital signals and understand their characteristics. Gain knowledge of different types of transmission media, such as wired (e.g., copper cables, fiber optics) and wireless (e.g., radio waves, microwave, satellite)..

UNIT I: ADVANCES IN BASICS MATHEMATICS 9hrs

Straight Lines: Different forms–Reduction of general equation into various forms–Point of intersection of two straight lines

Matrices: Types of matrices –Scalar multiple of a matrix–Multiplication of matrices –Transpose of a matrix and determinants

UNIT II: ADVANCES IN PHYSICS: 9hrs

Renewable energy: Generation, energy storage, and energy-efficient materials and devices. Recent advances in the field of nanotechnology: Quantum dots, Quantum Communication- recent advances in biophysics- recent advances in medical physics-Shape Memory Materials.

UNIT III: ADVANCES IN CHEMISTRY: 9hrs

Computer aided drug design and delivery, nano sensors, Chemical Biology, impact of chemical pollutants on Ecosystems and human health, Dye removal- Catalysis method

UNIT IV: ADVANCED APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY 9hrs

Mathematical Modeling applications in physics and chemistry Application of Renewable energy: Grid Integration and

Smart Grids, Application of nanotechnology: Nanomedicine.

Application of medical physics: Radiation Therapy, Nuclear medicine
Solidwastemanagement, Environmentalremediation-GreenTechnology, Watertreatment.

UNITV: Advanced Applications of computer Science 9hrs

Number System-Binary, Octal,decimal,andHexadecimal,Signals-Analog,Digital,Modem,Codec,Multiplexing, Transmission media, error detection and correction- even and odd parity, Networking devices-Repeater, hub, bridge, switch ,router, gateway.

Recommended books:

1. Coordinate Geometry by S.L.Lony, Arihant Publications
2. Calculus by Thomas and Finny, Pearson Publications
3. MatricesbyA.R. VasishtaandA.K. Vasishta, KrishnaPrakashanMedia(P)Ltd.
4. "Renewable Energy :Power for a Sustainable Future "by Godfrey Boyle
5. "EnergyStorage:ANontechnicalGuide"byRichardBaxter
6. "Nanotechnology:PrinciplesandApplications"bySulabhaK.KulkarniandRaghvendraA.Bohara
7. "Biophysics:AnIntroduction"byRodneyCotterill
8. "MedicalPhysics:Imaging"byJamesG. Webster
9. "ShapeMemoryAlloys:PropertiesandApplications"byDimitrisC.Lagoudas
10. Nanomaterials andapplicationsbyM.N.Borah
11. EnvironmentalChemistrybyAnil.K.D.E.
12. DigitalLogicDesignbyMorris Mano
13. DataCommunication&NetworkingbyBahrouzForouzan.




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DEPARTMENT OF COMPUTER SCIENCE



	Govt. Degree College, Nagari(A) Chittoor Dt	Program I B.Sc. Computer Sci. Hons.			
Course Code 2-03CS-PSC03-R24	TITLE OF THE COURSE Course – 3: Problem Solving Using C	Semester-II			
Teaching	Hours Allocated: 45 Hrs (Theory) (3 Hrs./wk.)	L	T	P	C
Pre-requisites	Basic knowledge about Computers and Computing Problems	3	-	-	3

Course Objectives:

1. To explore basic knowledge on computers
2. Learn how to solve common types of computing problems.
3. Learn to map problems to programming features of C.
4. Learn to write good portable C programs.

Course Outcomes:

COs	On Completion of the course, the students will be able to	Cognitive Domain
CO1	Understand the working of a digital computer and Fundamental constructs of Programming	Knowledge
CO2	Analyze and develop a solution to a given problem with suitable control structures	Understand
CO3	Apply the derived datatypes in program solutions	Apply
CO4	Use the 'C' language constructs in the right way	Analyze
CO5	Apply the Dynamic Memory Management for effective memory utilization	Apply

Syllabus:

UNIT 1:

(9 h)

Introduction to Computer Programming : Introduction, Basic block diagram and functions of various components of computer, Concepts of Hardware and software, Types of software, Compiler and interpreter, Flowcharts and Algorithms

Fundamentals of C: History of C, Features of C, C Tokens-variables and keywords and identifiers, constants and Data types, Rules for constructing variable names, Operators, Structure of C program Input/output statements in C-Formatted and Unformatted I/O.

UNIT 2:

(9 h)

Control statements: Decision making statements: if, if else, else if ladder, switch statements. Loop control statements: while loop, for loop and do-while loop. Jump Control statements: break, continue and goto.

UNIT 3:**(9 h)**

Derived data types in C: Arrays: One Dimensional arrays - Declaration, Initialization and Array representation in Memory; TwoDimensionalarrays-Declaration,InitializationandArrayrepresentation in Memory.

Strings:Declaring&Initializingstringvariables;Stringhandlingfunctions,Character handling functions.

UNIT 4:**(9 h)**

Functions:FunctionPrototype,definitionandcalling.Returnstatement.Categories of functions. Recursion, Parameter Passing by address & by value. **Storage classes:** automatic, external, static and register.

Pointers:Pointerdatatype,Pointerdeclaration,initialization,accessingvaluesusingpointers.Pointerarithmetic. Pointers and arrays.

UNIT 5:**(9 h)**

Dynamic Memory Management: Introduction, Functions-malloc, calloc, realloc ,free

Structures: Basics of structure, structure members, accessing structure members, nested structures, array of structures, Structure using in functions.

Unions-Union definition; difference between Structures and Unions.

List of Text Books :

1. E.Balagurusamy,“ProgramminginANSIC”,TataMcGrawHill,6thEdn,ISBN-13:978-1-25-90046-2
2. HerbertSchildt,—CompleteReferencewithC,TataMcGrawHill,4thEdn.,ISBN-13:9780070411838, 2000

List of Reference Books :

1. E.Balagurusamy,“COMPUTING FUNDAMENTALS & C PROGRAMMING ”,- TataMcGrawHill, Second Reprint 2008, ISBN978-0-07-066909-3
2. AshokNKamthane,ProgrammingwithANSIandTurboC, PearsonEdition Publ,2002

Lab Programs

1. A. Writeaprogramto calculate simple&compoundinterest
B. WriteaCprogramtointerchangetwonumbers.
2. FindthebiggestofthreenumbersusingC.
3. Writeaprogramtofindthesumofindividualdigitsofapositiveinteger.
4. AFibonaccisequenceisdefinedasfollows:thefirstandsecondtermsinthesequenceare0and1. Subsequenttermsarefoundbyaddingtheprecedingtwoterm sinthesequence.
5. WriteaprogramtocheckwhetheranumberisArmstrongornot.
6. Writeaprogramtogeneratealltheprimenumbersbetweenl andn,wherenisavaluesuppliedbytheuser.
7. Writeaprogramthat implements searching of givenitemingiven list
8. Writeaprogramthatusesfunctionstoperformthefollowing: Additionoftwomatrices.Multiplicationof two matrices.
9. Writeaprogramforconcatenationoftwo strings.
10. Writeaprogramforlengthofastringwithand without StringHandling functions
11. WriteaprogramtodemonstrateCallbyValueandCallbyReferencemechanism
12. WriteaProgramtofindGCDOftwonumbersusingRecursion
13. Writeaprogramtoperformvariousoperationsusingpointers.
14. Writeaprogramtoreaddataof10employeeswithastructureof
1.employeeid2.aadarno,3.title, 4.joineddate,5.salary, 6.date ofbirth, 7.gender, 8.department.
15. WriteaProgramtodemonstratedynamicarraysusingDynamicMemoryManagementfunctions




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DEPARTMENT OF COMPUTER SCIENCE



	Govt. Degree College, Nagari(A) Chittoor Dt.	Program I B.Sc. Computer Sci. Hons.			
Course Code 2-03CS-DLD04-R24	TITLE OF THE COURSE Course – 4: Digital Logic Design	Semester-II			
Teaching	Hours Allocated: 45 Hrs (Theory) (3 Hrs./wk.)	L	T	P	C
Pre-requisites	Basic knowledge about Computers and Computing Problems	3	-	-	3

Course Objectives:

To familiarize with the concepts of designing digital circuits.

Course Outcomes:

COs	On Completion of the course, the students will be able to	Cognitive Domain
CO1	Understand how to convert numbers from one radix to another radix and perform arithmetic operations.	Knowledge
CO2	Simplify Boolean functions using Boolean algebra and k-maps	Understand
CO3	Design adders and subtractors circuits	Apply
CO4	Design Combinational logic circuit such as decoders, encoders, multiplexers and demultiplexers	Analyze
CO5	Use flipflops to design registers and counters	Understand

Syllabus:

UNIT 1:

(9 h)

Number Systems: Binary, octal, decimal, hexadecimal number systems, conversion of numbers from one radix to another radix, r 's, $(r-1)$'s complements, signed binary numbers, addition and subtraction of unsigned and signed numbers, Weighted and Unweighted codes.

UNIT 2:

(9 h)

Logic Gates and Boolean Algebra: NOT, AND, OR, universal gates, X-OR and X-NOR gates, Boolean laws and theorems, complement and dual of a logic function, canonical and standard forms, minimizations of logic functions (POS and SOP) using Boolean theorems, K-map (upto four variables). don't care conditions.

UNIT 3:

(9 h)

Combinational Logic Circuits – 1: Design of half adder, full adder, half subtractor, full subtractor, ripple adders and subtractors, ripple adder / subtractor.

UNIT 4:

(9 h)

Combinational Logic Circuits – 2: Design of decoders, encoders, priority encoder, multiplexers, demultiplexers, realization of Boolean functions using decoders, multiplexers.

UNIT 5:**(9 h)**

Sequential Logic Circuits: Classification of sequential circuits, latch and flip-flop, RS- latch using NAND and NOR Gates, truth tables, RS, JK, T and D flip-flops, truth and excitation tables.

Design of registers, shift registers, bidirectional shift registers, universal shift register, design of ripple counters.

List of Text Books :

1. M. Morris Mano, Michael D Ciletti, "Digital Design", 5th edition, PEA

List of Reference Books :

1. Kohavi, Jha, "Switching and Finite Automata Theory", 3rd edition, Cambridge.
2. Leach, Malvino, Saha, "Digital Principles and Applications", 7th edition, TMH.
3. Roth, "Fundamentals of Logic Design", 5th edition, Cengage.

Lab Programs

1. Introduction to digital electronics lab- nomenclature of digital ICs, specifications, study of the data sheet, concept of Vcc and ground, verification of the truth tables of logic gates using TTL ICs.
2. Implementation of the given Boolean functions using logic gates in both SOP and POS forms
3. Realization of basic gates using universal gates.
4. Design and implementation of half and full adder circuits using logic gates.
5. Design and implementation of half and full subtractor circuits using logic gates.
6. Verification of stable tables of RS, JK, T and D flip-flops using NAND gates.
7. Verification of stable tables of RS, JK, T and D flip-flops using NOR gates.
8. Implementation and verification of Decoder and encoder using logic gates.
9. Implementation of 4X1 MUX and DeMUX using logic gates.
10. Implementation of 8X1 MUX using suitable lower order MUX.
11. Implementation of 7-segment decoder circuit.
12. Implementation of 4-bit parallel ladder.
13. Design and verification of 4-bit synchronous counter.
14. Design and verification of 4-bit asynchronous counter.

III Semester
Course 5: Object Oriented Programming using Java
Credits -3

Course Objectives

To introduce the fundamental concepts of Object-Oriented programming and to design & implement object-oriented programming concepts in Java.

Course Outcomes

Upon successful completion of the course, a student will be able to:

1. Understand the basic concepts of Object-Oriented Programming and Java Program Constructs
2. Implement classes and objects and analyze Inheritance and Dynamic Method Dispatch
3. Demonstrate various classes in different packages and can design own packages
4. Manage Exceptions and Apply Threads
5. Create GUI screens along with event handling

UNIT-I

OOPs Concepts and Java Programming: Introduction to Object-Oriented concepts, procedural and object-oriented programming paradigm

Java programming: An Overview of Java, Java Environment, Data types, Variables, constants, scope and life time of variables, operators, type conversion and casting, Accepting Input from the Keyboard, Reading Input with Java.util.Scanner Class, Displaying Output with System.out.printf(), Displaying Formatted Output with String.format(), Control Statements

UNIT-II

Arrays, Command Line Arguments, Strings-String Class Methods

Classes & Objects: Creating Classes, declaring objects, Methods, parameter passing, static fields and methods, Constructors, and 'this' keyword, overloading methods and access

Inheritance: Inheritance hierarchies, super and subclasses, member access rules, 'super' keyword, preventing inheritance: final classes and methods, the object class and its methods; **Polymorphism:** Dynamic binding, method overriding, abstract classes and methods;

UNIT-III

Interface: Interfaces VS Abstract classes, defining an interface, implement interfaces, accessing implementations through interface references, extending interface;

Packages: Defining, creating and accessing a package, understanding CLASSPATH, importing packages.

Exception Handling: Benefits of exception handling, the classification of exceptions, exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, rethrowing exceptions, exception specification, built in exceptions, creating own exceptions sub classes.

UNIT-IV

Multithreading: Differences between multiple processes and multiple threads, thread states, thread life cycle, creating threads, interrupting threads, thread priorities, synchronizing threads, inter thread communication.

Stream based I/O (java.io) – The Stream classes-Byte streams and Character streams, Reading console Input and Writing Console Output, File class, Reading and writing Files, The Console class, Serialization

UNIT-V

GUI Programming with Swing- Introduction, MVC architecture, components, containers. Understanding Layout Managers - Flow Layout, Border Layout, Grid Layout, Card Layout, GridBag Layout.

Event Handling- The Delegation event model- Events, Event sources, Event Listeners, Event classes, Handling mouse and keyboard events, Adapter classes, Inner classes, Anonymous Inner classes.

Text Books:

1. Java The complete reference, 9th edition, Herbert Schildt, McGraw Hill.
2. Understanding Object-Oriented Programming with Java, updated edition, T. Budd, Pearson Education.

Reference Books

1. Cay S. Horstmann, “Core Java Fundamentals”, Volume 1, 11 th Edition, Prentice Hall, 2018.
2. Paul Deitel, Harvey Deitel, “Java SE 8 for programmers”, 3rd Edition, Pearson, 2015.
3. S. Malhotra, S. Chudhary, Programming in Java, 2nd edition, Oxford Univ. Press.

SUGGESTED CO-CURRICULAR ACTIVITIES & EVALUATION METHODS:

Unit 1: Activity: Quiz on Object-Oriented Programming Concepts and Java Constructs

Evaluation Method: Quiz Performance and Knowledge Retention

Unit 2: Activity: Object-Oriented Programming Assignment: Class Implementation

Evaluation Method: Assignment Completion and Correctness

Unit 3: Activity: Hands-on Lab Activity: Creating and Using Custom Java Packages

Evaluation Method: Lab Performance and Correctness of Code Implementation

Unit 4: Activity: Case Study Discussion on where multi-threading is crucial

Evaluation Method: Critical thinking, problem-solving, and presentation skills.

Unit 5: Activity: GUI design contest using Java Swings

Evaluation Method: GUI design, Visual appearance and user friendliness, usability, and adherence to event handling principles.

III Semester
Course 5: Object Oriented Programming using Java Lab
Credits -1

List of Experiments

1. Write a Java program to print Fibonacci series using for loop.
2. Write a Java program to calculate multiplication of 2 matrices.
3. Create a class Rectangle. The class has attributes length and width. It should have methods that calculate the perimeter and area of the rectangle. It should have read Attributes method to read length and width from user.
4. Write a Java program that implements method overloading.
5. Write a Java program for sorting a given list of names in ascending order.
6. Write a Java program that displays the number of characters, lines and words in a text file.
7. Write a Java program to implement various types of inheritance
 - i. Single
 - ii. Multi-Level
 - iii. Hierarchical
 - iv. Hybrid
8. Write a java program to implement runtime polymorphism.
9. Write a Java program which accepts withdraw amount from the user and throws an exception “In Sufficient Funds” when withdraw amount more than available amount.
10. Write a Java program to create three threads and that displays “good morning”, for every one second, “hello” for every 2 seconds and “welcome” for every 3 seconds by using extending Thread class.
11. Write a Java program that creates three threads. First thread displays “OOPS”, the second thread displays “Through” and the third thread Displays “JAVA” by using Runnable interface.
12. Implement a Java program for handling mouse events when the mouse entered, exited, clicked, pressed, released, dragged and moved in the client area.
13. Implement a Java program for handling key events when the key board is pressed, released, typed.
14. Write a Java swing program that reads two numbers from two separate text fields and display sum of two numbers in third text field when button “add” is pressed.
15. Write a Java program to design student registration form using Swing Controls. The form which having the following fields and button SAVE

Form Fields are: Name, RNO, Mailid, Gender, Branch, Address.

III Semester
Course 6: Data Structures using C
Credits -3

Course Objectives

To introduce the fundamental concept of data structures and to emphasize the importance of various data structures in developing and implementing efficient algorithms.

Course Outcomes

Upon successful completion of the course, a student will be able to:

1. Understand various Data Structures for data storage and processing.
2. Realize Linked List Data Structure for various operations
3. Analyze step by step and develop algorithms to solve real world problems by implementing Stacks, Queues data structures.
4. Understand and implement various searching & sorting techniques.
5. Understand the Non-Linear Data Structures such as Binary Trees and Graphs

UNIT-I

Basic Concepts: Pointers and dynamic memory allocation, Algorithm-Definition and characteristics, Algorithm Analysis-Space Complexity, Time Complexity, Asymptotic Notation **Introduction to Data structures:** Definition, Types of Data structure, Abstract Data Types (ADT), Difference between Abstract Data Types, Data Types, and Data Structures.

Arrays-Concept of Arrays, Single dimensional array, Two dimensional array, Operations on arrays with Algorithms (searching, traversing, inserting, deleting)

UNIT-II

Linked List: Concept of Linked Lists, Representation of linked lists in Memory, Comparison between Linked List and Array, Types of Linked Lists - Singly Linked list, Doubly Linked list, Circularly Singly Linked list, Circularly Doubly Linked list;

Implementation of Linked List ADT: Creating a List, Traversing a linked list, Searching linkedlist, Insertion and deletion into linked list (At first Node, Specified Position, Last node), Application of linked lists

UNIT-III

Stacks: Introduction to stack ADT, Representation of stacks with array and Linked List, Implementation of stacks, Application of stacks - Polish Notations - Converting Infix to Post Fix Notation - Evaluation of Post Fix Notation - Tower of Hanoi, Recursion: Concept and Comparison between recursion and Iteration

Queues: Introduction to Queue ADT, Representation of Queues with array and Linked List, Implementation of Queues, Application of Queues Types of Queues- Circular Queues, De-queues, Priority Queue

UNIT-IV

Searching: Linear or Sequential Search, Binary Search and Indexed Sequential Search

Sorting: Selection Sort, Bubble Sort, Insertion Sort, Quick Sort and Merge Sort

UNIT-V

Binary Trees: Concept of Non- Linear Data Structures, Introduction Binary Trees, Types of Trees, Basic Definition of Binary Trees, Properties of Binary Trees, Representation of Binary Trees, Operations on a Binary Search Tree, Binary Tree Traversal, Applications of Binary Tree.

Graphs: Introduction to Graphs, Terms Associated with Graphs, Sequential Representation of Graphs, Linked Representation of Graphs, Traversal of Graphs (DFS, BFS), Application of Graphs.

Text Books:

1. Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publications Pvt Ltd Delhi India.
2. A.K. Sharma ,Data Structure Using C, Pearson Education India.
3. "Data Structures Using C" Balagurusamy E. TMH

Reference Books

1. "Data Structures through C", Yashavant Kanetkar, BPB Publications
2. Rajesh K. Shukla, "Data Structure Using C and C++" Wiley Dreamtech Publication.
3. Lipschutz, "Data Structures" Schaum's Outline Series, Tata Mcgraw-hill Education (India)Pvt. Ltd .
4. Michael T. Goodrich, Roberto Tamassia, David M. Mount "Data Structures and Algorithms in C++", Wiley India.

SUGGESTED CO-CURRICULAR ACTIVITIES & EVALUATION METHODS:

Unit 1: Activity: Algorithm analysis exercises

Evaluation Method: Programming Assignment and Correctness

Unit 2: Activity: Presentations on real-life applications of linked lists

Evaluation Method: Presentation skills or reports

Unit 3: Activity: Role-playing activities for stack operations

Evaluation Method: Problem-solving skills, communication and collaboration abilities.

Unit 4: Activity: Sorting algorithm analysis and comparison activities

Evaluation Method: Performance analysis and presentation.

Unit 5: Activity: Case Study on Applications of Graphs

Evaluation Method: Critical thinking, problem-solving, and presentation skills

III Semester
Course 6: Data Structures Using C
Credits -1

List of Experiments:

1. Write a program to read 'N' numbers of elements into an array and also perform the following operation on an array
 - a. Add an element at the beginning of an array
 - b. Insert an element at given index of array
 - c. Update an element using a values and index
 - d. Delete an existing element
 2. Write Program to implement Single Linked List with insertion, deletion and traversal operations
 3. Write Program to implement Circular doubly Linked List with insertion, deletion and traversal operations
 4. Write Programs to implement the Stack operations using an array
 5. Write a program using stacks to convert a given infix expression to postfix
 6. Write Programs to implement the Stack operations using Liked List.
 7. Write Programs to implement the Queue operations using an array.
 8. Write Programs to implement the Queue operations using Liked List.
 9. Write a program for Binary Search Tree Traversals
 10. Write a program to search an item in a given list using the following Searching Algorithms
 - a. Linear Search
 - b. Binary Search.
 11. Write a program for implementation of the following Sorting Algorithms
 - a. Bubble Sort
 - b. Insertion Sort
 - c. Quick Sort
-

III Semester
Course 7: Computer Organization
Credits -3

Course Objectives

To familiarize with organizational aspects of memory, processor and I/O.

Course Outcomes

Upon successful completion of the course, the students will be able to

1. Identify different types of instructions
2. Differentiate between micro-programmed and hard-wired control units.
3. Analyse the performance of hierarchical organization of memory.
4. Summarize different data transfer techniques.
5. Demonstrate arithmetic operations on fixed- and floating-point numbers and illustrate concepts of parallel processing.

UNIT – I

Register Transfer Language and Micro Operations: Introduction- Functional units, computer registers, register transfer language, register transfer, bus and memory transfers, arithmetic, logic and shift micro-operations, arithmetic logic shift unit.

Basic Computer Organization and Design: Instruction codes, instruction cycle.

Register reference instructions, Memory – reference instructions, input – output and interrupt.

UNIT – II

CPU and Micro Programmed Control: Central Processing unit: Introduction, instruction formats, addressing modes. Control memory, address sequencing, design of control unit - hard wired control, micro programmed control.

UNIT – III

Memory Organization: Memory hierarchy, main memory, auxiliary memory, associative memory, cache Memory and mappings.

UNIT – IV

Input-Output Organization: Peripheral Devices, input-output interface, asynchronous data transfer, modes of transfer- programmed I/O, priority interrupt, direct memory access, Input – Output Processor (IOP).

UNIT – V

Computer Arithmetic and Parallel Processing: Data representation- fixed point, floating point, addition and subtraction, multiplication and division algorithms.

Parallel Processing-Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline.

Text Books:

1. M. Moris Mano, “Computer Systems Architecture”, 3rd edition, Pearson/ PHI.

Reference Books:

1. Carl Hamacher, ZvonksVranesic, SafeaZaky, “Computer Organization”, 5th edition, McGraw Hill.
2. William Stallings, “Computer Organization and Architecture”, 8th edition, Pearson/PHI.

SUGGESTED CO-CURRICULAR ACTIVITIES & EVALUATION METHODS:

Unit 1: Activity: Quiz competition on micro-operations.

Evaluation Method: Accuracy and speed in answering quiz questions.

Unit 2: Activity: Instruction Format Puzzle: Solving a puzzle to decode and understand instruction formats.

Evaluation Method: Accuracy and speed in completing the puzzle.

Unit 3: Activity: Memory Hierarchy Poster: Creating informative posters or infographics on memory hierarchy.

Evaluation Method: Clarity of information, presentation and creativity of visual design.

Unit 4: Activity: I/O Troubleshooting Challenge

Evaluation Method: problem identification, feasibility of proposed solutions, and clarity of explanations.

Unit 5: Activity: Case Study on Parallel processing architecture.

Evaluation Method: Understanding of parallel processing concepts and architectures.

III Semester

Course 3: Computer Organization

Credits -1

Lab Experiments

1. Implement a C program to convert a Hexadecimal, octal, and binary number to decimal number vice versa.
 2. Implement a C program to perform Binary Addition & Subtraction.
 3. Implement a C program to perform Multiplication of two binary numbers.
 4. Implement arithmetic micro-operations using logic gates.
 5. Implement logic and shift micro-operations using logic gates.
 6. Implement a C program to perform Multiplication of two binary numbers (signed) using Booth's Algorithms.
 7. Implement a C program to perform division of two binary numbers (Unsigned) using restoring division algorithm.
 8. Implement a C program to perform division of two binary numbers (Unsigned) using non-restoring division algorithm.
 9. Write assembly language code for $A+B*(C-D)$ using various instruction formats in MASM or any open-source assembler.
 10. Write assembly language code for $A+B*C$ using various addressing modes in MASM or any open-source assembler.
-

III Semester
Course 8: Operating Systems
Credits -3

Course Objectives

To gain knowledge about various functions of an operating system like memory management, process management, device management, etc.

Course Outcomes:

Upon successful completion of the course, a student will be able to:

1. Demonstrate knowledge and comprehension of operating system functions.
2. Analyze different process scheduling algorithms and apply them to manage processes and threads effectively
3. Create strategies to prevent, detect, and recover from deadlocks, and design solutions for inter-process communication and synchronization problems.
4. Compare and contrast different memory allocation strategies and evaluate their effectiveness
5. Evaluate disk scheduling algorithms while implementing OS security measures

UNIT- I

What is Operating System? History and Evolution of OS, Basic OS functions, Resource Abstraction, Types of Operating Systems– Multiprogramming Systems, Batch Systems, Time Sharing Systems; Operating Systems for Personal Computers, Workstations and Hand-held Devices, Process Control & Real time Systems.

UNIT- II

Processor and User Modes, Kernels, System Calls and System Programs, System View of the Process and Resources, Process Abstraction, Process Hierarchy, Threads, Threading Issues, Thread Libraries; Process Scheduling- Non-Preemptive and Preemptive Scheduling Algorithms.

UNIT III

Process Management: Deadlock, Deadlock Characterization, Necessary and Sufficient Conditions for Deadlock, Deadlock Handling Approaches: Deadlock Prevention, Deadlock Avoidance and Deadlock Detection and Recovery.

Concurrent and Dependent Processes, Critical Section, Semaphores, Methods for Inter process Communication; Process Synchronization, Classical Process Synchronization Problems: Producer-Consumer, Reader-Writer.

UNIT IV

Memory Management: Physical and Virtual Address Space; Memory Allocation Strategies–Fixed and -Variable Partitions, Paging, Segmentation, Virtual Memory.

UNIT V

File and I/O Management, OS security: Directory Structure, File Operations, File Allocation Methods, Device Management, Pipes, Buffer, Shared Memory, Disk Scheduling algorithms.

Text Books:

1. Operating System Principles by Abraham Silberschatz, Peter Baer Galvin and Greg Gagne (7th Edition) Wiley India Edition.

Reference Books

1. Operating Systems: Internals and Design Principles by Stallings (Pearson)
2. Operating Systems by J. Archer Harris (Author), Jyoti Singh (Author) (TMH)

SUGGESTED CO-CURRICULAR ACTIVITIES & EVALUATION METHODS:

Unit 1: Activity: Case Study on a specific Operating System: highlighting its functions and key features.

Evaluation Method: Case study presentation, depth of understanding of operating system functions, and ability to articulate key concepts.

Unit 2: Activity: Comparison Poster on Scheduling Algorithms

Evaluation Method: Assessment of posters based on content accuracy, clarity of information, visual presentation, and ability to convey key insights.

Unit 3: Activity: Assignment on Dead Lock prevention techniques

Evaluation Method: Understanding, Completion and report.

Unit 4: Activity: Debate on various Memory allocation schemes

Evaluation Method: Debate arguments, ability to counter opposing viewpoints, logical reasoning, and presentation skills.

Unit 5: Activity: Comparative study of various disk scheduling algorithms using real world datasets

Evaluation Method: Analysis methodology, accuracy of results, and presentation of findings and conclusions.

III Semester
Course 8: Operating Systems
Credits -1

List of Experiments:

1. Illustrate the LINUX commands
 - a) pwd
 - b) mkdir
 - c) rmdir
 - d) grep
 - e) chmod
 - f) ls
 - g) rm
 - h) cp
 2. Write a program to calculate average waiting time and turn around time of each process using the following CPU Scheduling algorithm for the given process schedules.
 - a) FCFS
 - b) SJF
 - c) Priority
 - d) Round Robin
 3. Simulate MVT and MFT memory management techniques
 4. Write a program for Bankers Algorithm for Dead Lock Avoidance
 5. Implement Bankers Algorithm Dead Lock Prevention.
 6. Write a program to simulate Producer-Consumer problem.
 7. Simulate all Page replacement algorithms.
 - e) FIFO
 - f) LRU
 - g) LFU
 - h) Optimal
 8. Simulate Paging Techniques of memory management
 9. Simulate the following disk scheduling algorithms
 - a) FCFS
 - b) SSTF
 - c) SCAN
 - d) CSCAN
-

IV Semester
Course 9: Database Management Systems
Credits -3

Learning Objectives:

To familiarize with concepts of database design

Learning Outcomes: On successful completion of the course, students will be able to

1. Differentiate between database systems and file based systems
2. Design a database using ER model
3. Use relational model in database design
4. Use SQL commands for creating and manipulating data stored in databases.
5. Write PL/SQL programs to work with databases.

UNIT - I

Overview of Database Management System: Introduction to data, information, database, database management systems, file-based system, Drawbacks of file-Based System, database approach, Classification of Database Management Systems, advantages of database approach, Various Data Models, Components of Database Management System, three schema architecture of data base, costs and risks of database approach.

UNIT - II

Entity-Relationship Model: Introduction, the building blocks of an entity relationship diagram, classification of entity sets, attribute classification, relationship degree, relationship classification, reducing ER diagram to tables, enhanced entity-relationship model (EER model), generalization and specialization, IS A relationship and attribute inheritance, multiple inheritance, constraints on specialization and generalization, advantages of ER modeling.

UNIT - III

Relational Model: Introduction, CODD Rules, relational data model, concept of key, relational integrity, relational algebra, relational algebra operations, advantages of relational algebra,

limitations of relational algebra, relational calculus, tuple relational calculus, domain relational Calculus (DRC), Functional dependencies and normal forms upto 3rd normal form.

UNIT - IV

Structured Query Language: Introduction, Commands in SQL, Data Types in SQL, Data Definition Language, Selection Operation, Projection Operation, Aggregate functions, Data Manipulation Language, Table Modification Commands, Join Operation, Set Operations, View, Sub Query.

UNIT - V

PL/SQL: Introduction, Shortcomings of SQL, Structure of PL/SQL, PL/SQL Language Elements, Data Types, Operators Precedence, Control Structure, Steps to Create a PL/SQL, Program, Iterative Control, Procedure, Function, Database Triggers, Types of Triggers.

Text Books:

1. Operating System Principles by Abraham Silberschatz, Peter Baer Galvin and GregGagne (7th Edition) Wiley India Edition.

Reference Books

1. Database Management Systems by Raghu Ramakrishnan, McGrawhill
2. Principles of Database Systems by J. D. Ullman
3. Fundamentals of Database Systems by R. Elmasri and S. Navathe
4. SQL: The Ultimate Beginners Guide by Steve Tale.

SUGGESTED CO-CURRICULAR ACTIVITIES & EVALUATION METHODS:

Unit 1: Activity: Seminar Presentation on Database Management Systems

Evaluation Method: Depth of research, clarity of explanations, ability to address questions and engage the audience.

Unit 2: Activity: Case Study on EER model

Evaluation Method: Identification of inheritance relationships, effective use of generalization and specialization, and adherence to constraints.

Unit 3: Activity: Exercise on Normalization: Assign students a set of unnormalized tables and have them normalize the tables to third normal form

Evaluation Method: Normalized table designs, identification of functional dependencies, adherence to normalization rules, and elimination of anomalies.

Unit 4: Activity: Competition on SQL Query Writing

Evaluation Method: Query correctness, efficiency, proper use of SQL commands, ability to handle complex scenarios, and creativity in query formulation.

Unit 5: Activity: Peer Review of PL/SQL code

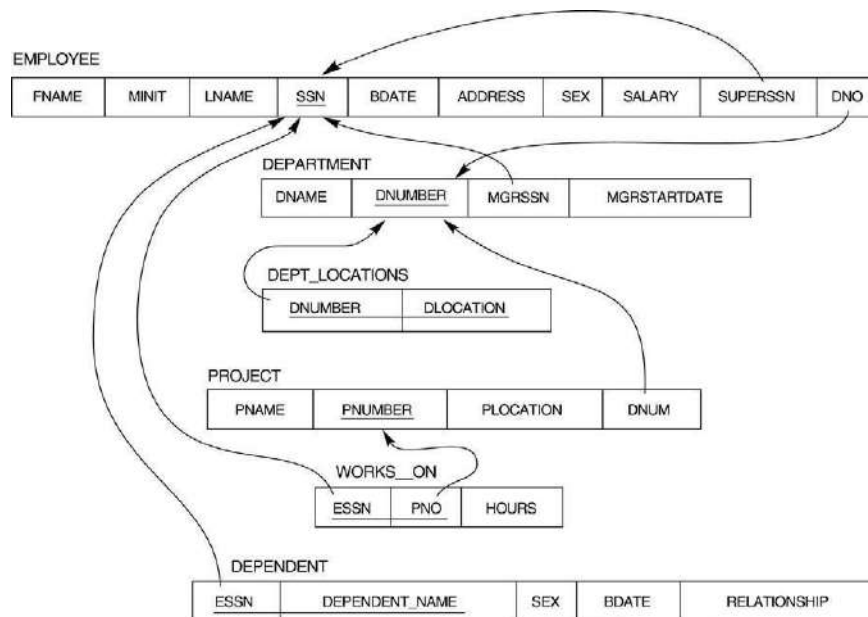
Evaluation Method: Peer evaluation of code quality, adherence to coding standards, proper use of language elements, and logic.

IV Semester
Course 9: Database Management Systems
Credits -1

List of Experiments:

1. Draw ER diagram for hospital administration
2. Creation of college database and establish relationships between tables
3. Relational database schema of a company is given in the following figure.

Relational Database Schema - COMPANY



Questions to be performed on above schema

1. Create above tables with relevant Primary Key, Foreign Key and other constraints
 2. Populate the tables with data
 3. Display all the details of all employees working in the company.
 4. Display ssn, lname, fname, address of employees who work in department no 7.
 5. Retrieve the Birthdate and Address of the employee whose name is 'Franklin T. Wong'
 6. Retrieve the name and salary of every employee
 7. Retrieve all distinct salary values
 8. Retrieve all employee names whose address is in 'Bellaire'
 9. Retrieve all employees who were born during the 1950s
 10. Retrieve all employees in department 5 whose salary is between 50,000 and 60,000(inclusive)
-

11. Retrieve the names of all employees who do not have supervisors
 12. Retrieve SSN and department name for all employees
 13. Retrieve the name and address of all employees who work for the 'Research' department
 14. For every project located in 'Stafford', list the project number, the controlling department number, and the department manager's last name, address, and birth date.
 15. For each employee, retrieve the employee's name, and the name of his or her immediate supervisor.
 16. Retrieve all combinations of Employee Name and Department Name
 17. Make a list of all project numbers for projects that involve an employee whose last name is 'Narayan' either as a worker or as a manager of the department that controls the project.
 18. Increase the salary of all employees working on the 'Product X' project by 15%. Retrieve employee name and increased salary of these employees.
 19. Retrieve a list of employees and the project name each works in, ordered by the employee's department, and within each department ordered alphabetically by employee first name.
 20. Select the names of employees whose salary does not match with salary of any employee in department 10.
 21. Retrieve the employee numbers of all employees who work on project located in Bellaire, Houston, or Stafford.
 22. Find the sum of the salaries of all employees, the maximum salary, the minimum salary, and the average salary. Display with proper headings.
 23. Find the sum of the salaries and number of employees of all employees of the 'Marketing' department, as well as the maximum salary, the minimum salary, and the average salary in this department.
 24. Select the names of employees whose salary is greater than the average salary of all employees in department 10.
 25. Delete all dependents of employee whose ssn is '123456789'.
 26. Perform a query using alter command to drop/add field and a constraint in Employee table.
-

IV Semester
Course 10: Object Oriented Software Engineering
Credits -3

Course Objective:

To introduce Object-oriented software engineering (OOSE) - which is a popular technical approach to analyzing, designing an application, system, or business by applying the object-oriented paradigm and visual modeling.

Course Outcomes:

Upon successful completion of the course, a student will be able to:

1. Understand and apply the fundamental principles of Object-Oriented Programming (OOP) concepts and Unified Modeling Language (UML) basics, in the development of software solutions.
2. Analyze and specify software requirements, develop use cases and scenarios, apply object-oriented analysis and design (OOAD) principles
3. Familiar with the concept of test-driven development (TDD) and its practical implementation
4. Analyze and Evaluate Software Maintenance and Evolution Strategies
5. Apply Advanced Object-Oriented Software Engineering Concepts

UNIT-I

Introduction to Object-Oriented Programming: Overview of software engineering, Introduction to Object-Oriented Programming (OOP) concepts (classes, objects, inheritance, polymorphism), Unified Modelling Language (UML) basics, Introduction to software development process and software development life cycle (SDLC).

UNIT-II

Requirements Analysis and Design: Requirements analysis and specification, Use cases and scenarios, Object-oriented analysis and design (OOAD), Design patterns, UML modelling techniques (class diagrams, sequence diagrams, state machine diagrams, activity diagrams)

UNIT-III

Software Construction and Testing: Software construction basics, Object-oriented design principles, Object-oriented programming languages (Java, C++, Python), Software testing basics (unit testing, integration testing, system testing), Test-driven development (TDD)

UNIT-IV

Software Maintenance and Evolution: Software maintenance basics, refactoring techniques Software version control, Code review and inspection, Software evolution and reengineering

UNIT-V

Advanced Topics in Object-Oriented Software Engineering: Model-driven engineering (MDE), Aspect-oriented programming (AOP), Component-based software engineering (CBSE), Service-oriented architecture (SOA), Agile software development and Scrum methodologies.

Text Book(s)

1. An Introduction to Object-Oriented Analysis and Design and the Unified Process, 3rd Edition, Craig Larman, Prentice-Hall.
2. Programming in Java by Sachin Malhotra, Oxford University Press

Reference Books

1. Requirements engineering: processes and techniques, G.Kotonya and, I.Sommerville, 1998, Wiley
2. Design Patterns, E.Gamma, R. Helm, R. Johnson, and J. Vlissides
3. The Unified Modeling Language Reference Manual, J. Rumbaugh, I.Jacobson and G. Booch, Addison Wesley

SUGGESTED CO-CURRICULAR ACTIVITIES & EVALUATION METHODS:

Unit 1: Activity: Group Activity: Design and implement a small OOP project

Evaluation Method: Presentation evaluation rubric, Project evaluation based on OOP principles.

Unit 2: Activity: Use Case Scenario Presentation & Peer Activity: Review and provide feedback on each other's use case diagrams

Evaluation Method: Presentation evaluation rubric, Peer feedback assessment.

Unit 3: Activity: Poster Presentation: Illustrate TDD principles and benefits

Evaluation Method: Poster presentation evaluation

Unit 4: Activity: Peer Activity: Analyze and discuss different maintenance strategies

Evaluation Method: Peer discussion participation evaluation

Unit 5: Activity: Seminar on Design Patterns

Evaluation Method: Depth of research, clarity of explanations, ability to address questions and engage the audience.

IV Semester
Course 10: Object Oriented Software Engineering
Credits -1

Suggested Software Tools: StarUML/UMLGraph/Topcased/Umberollo/ArgoUML/ Eclipse IDE, Visual Paradigm for UML/Rational Software Architect/Any other Open Source Tool

List of Experiments:

Select domain of interest (e.g. College Management System) and identify multi-tier software application to work on (e.g. Online Fee Collection). Analyze, design and develop this application using OOSE approach:

1. Develop an IEEE standard SRS document. Also develop risk management and project plan (Gantt chart).
 2. Understanding of System modeling: Data model i.e. ER – Diagram and draw the ER Diagram with generalization, specialization and aggregation of specified problem statement
 3. Understanding of System modeling: Functional modeling: DFD level 0 i.e. Context Diagram and draw it
 4. Understanding of System modeling: Functional modeling: DFD level 1 and DFD level 2 and draw it.
 5. Identify use cases and develop the use case model.
 6. Identify the business activities and develop an UML Activity diagram.
 7. Identify the conceptual classes and develop a domain model with UML Class diagram.
 8. Using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.
 9. Draw the state chart diagram.
 10. Identify the user interface, domain objects, and technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
 11. Implement the technical services layer.
 12. Implement the domain objects layer.
 13. Implement the user interface layer.
 14. Draw component and deployment diagrams.
-

IV Semester
Course 11: Data Communication and Computer Networks
Credits -3

Course Objectives

To provide students with a comprehensive understanding of networking principles, protocols, and technologies, enabling them to design, analyze, and evaluate efficient and reliable network solutions.

Course Outcomes

Upon successful completion of the course, a student will be able to:

1. Understand and apply network applications, hardware, software, and reference models for network communication.
2. Design and analyze data link layer protocols, multiple access protocols, and wireless LAN technologies.
3. Design routing algorithms, congestion control algorithms, and evaluate network layer protocols for internetworking.
4. Analyze transport service, transport protocols, and evaluate UDP and TCP in the internet.
5. Understand and evaluate application layer protocols, including DNS, email, WWW, and network management protocols.

UNIT-I

INTRODUCTION: Network applications, network hardware, network software, reference models: OSI, TCP/IP, Internet, Connection oriented network - X.25, frame relay.

THE PHYSICAL LAYER: Theoretical basis for communication, guided transmission media, wireless transmission, the public switched telephone networks, mobile telephone system.

UNIT-II

THE DATA LINK LAYER: Design issues, error detection and correction, elementary data link protocols, sliding window protocols, example data link protocols - HDLC, the data link layer on the internet.

THE MEDIUM ACCESS SUBLAYER: Channel allocations problem, multiple access protocols, Ethernet, Data Link Layer switching, Wireless LAN, Broadband Wireless, Bluetooth.

UNIT-III

THE NETWORK LAYER: Network layer design issues, routing algorithms, Congestion control algorithms, Internetworking, the network layer in the internet (IPv4 and IPv6), Quality of Service.

UNIT-IV

THE TRANSPORT LAYER: Transport service, elements of transport protocol, SimpleTransport Protocol, Internet transport layer protocols: UDP and TCP.

UNIT-V

THE APPLICATION LAYER: Domain name system, electronic mail, World Wide Web: architectural overview, dynamic web document and http.

APPLICATION LAYER PROTOCOLS: Simple Network Management Protocol, File Transfer Protocol, Simple Mail Transfer Protocol, Telnet.

Text Book(s)

1. S. Tanenbaum (2003), Computer Networks, 4th edition, Pearson Education/ PHI, New Delhi, India

Reference Books

2. Behrouz A. Forouzan (2006), Data communication and Networking, 4th Edition, Mc Graw-Hill, India.
3. Kurose, Ross (2010), Computer Networking: A top down approach, Pearson Education, India.

SUGGESTED CO-CURRICULAR ACTIVITIES & EVALUATION METHODS:

Unit 1: Activity: Hands-on exercises to configure network applications

Evaluation Method: Practical skills in configuring network applications, hardware, and software.

Unit 2: Activity: Protocol Design and Simulation using simulation tools like NS-3 or Cisco Packet Tracer.

Evaluation Method: Students' ability to design and simulate data link layer protocols and multiple access protocols

Unit 3: Activity: Guest Lectures and Workshops on routing algorithms, congestion control, and network layer protocols.

Evaluation Method: Students' participation and understanding demonstrated in guest lectures and workshop

Unit 4: Activity: Network Monitoring and Traffic Analysis using tools like Wireshark

Evaluation Method: Understanding of transport protocols through their analysis of network traffic and identification of UDP and TCP behavior

Unit 5: Activity: Group Projects on Network Application Development

Evaluation Method: Group Project Presentations

IV Semester
Course 11: Data Communication and Computer Networks
Credits -1

List of Experiments:

1. Understanding various network tools in Windows and Linux
2. Study different types of Network devices and Cables
3. Building a Local Area Network
4. Concept of Network IP Address
5. Introduction to Network Simulator – Packet Tracer (PT)
6. Configuration of a Router using Packet Tracer
7. Implementation of a Network using Packet Tracer
8. Implementation of Static Routing using Packet Tracer
9. Implementation of RIP using Packet Tracer
10. Implementation of OSPF using Packet Tracer
11. Implement DNS using packet tracer
12. Implementation of a VLAN using Packet Tracer

Course Code:

**SRI VENKATESWARA UNIVERSITY
B.Sc. DEGREE COURSE IN COMPUTER SCIENCE
SEMESTER SYSTEM WITH CBCS**

SEMESTER V

W.E.F. 2022-2023

*Skill Enhancement Courses (SECs) for Semester V,
from 2022-23 (Syllabus with Learning Outcomes,
References, Co-curricular Activities)*

Max Marks: 100+50

COURSE6A: WEB INTERFACE DESIGNING TECHNOLOGIES

(Skill Enhancement Course(Elective),Credits:05)

I. Learning Outcomes: Students after successful completion of the course will be able to:

1. Understand and appreciate the web architecture and services.
2. Gain knowledge about various component sofa website.
3. Demonstrate skills regarding creation of a static website and an interface to dynamic website.
4. Learn how to install word press and gain the knowledge of installing various pluginstouse in their websites.

II. Syllabus: (Total Hours:90including Teaching, Lab, and Field training, Unit tests etc.)

Unit-I

(10 hours)

HTML : Introduction to web designing, difference between web applications and desktop applications, introduction to HTML, HTML structure, elements, attributes, headings, paragraphs, styles, colours, HTML formatting, Quotations, Comments, images, tables, lists, blocks and classes, HTML CSS, HTML frames, file paths, layout, symbols, HTML responsive.

Unit- II

(10 hours)

HTML forms: HTML form elements, input types, input attributes, HTML5, HTML graphics, HTML media video, audio, plugINS, youtube. **HTML API'S:** Geolocation, Drag/drop, local storage, HTML SSE. **CSS:** CSS home, introduction, syntax, colours, background, borders, margins, padding, height/width, text, fonts, icons, tables, lists, position, over flow, float, CSS combinators, pseudo class, pseudo elements, opacity, tool tips, image gallery, CSS forms, CSS counters, CSS responsive.

Unit- III

(10 hours)

Client side Validation: Introduction to JavaScript - What is DHTML, JavaScript,basics,variables,stringmanipulations,mathematicalfunctions,statements,operators,arrays,functions.ObjectsinJavaScriptDataandobjectsinJavaScript,regularexpressions,exception handling. DHTML with JavaScript-Data validation, opening a new window, messages and confirmations, the status bar, different frames, rollover buttons, moving images.

Unit- IV

(10 hours)

Word press : Introduction to word press, servers like wamp, bitnami e.tc, installing and configuring word press, understanding admin panel, working with posts and pages, using editor, text formatting with shortcuts, working with media-Adding, editing, deleting media elements, working with widgets, menus.

Unit- V

(10 hours)

Working with themes-parent and child themes, using featured images, configuring settings, user and user roles and profiles, adding external links, extending word press with plug-ins. Customizing the site, changing the appearance of site using css , protecting word press website from hackers.

III. References

1. ChrisBates,WebProgrammingBuildingInternetApplications,SecondEdition,Wiley(2007)
2. PaulS.WangSandaS.Katila,anIntroductiontoWebDesignplusProgramming,Thomson (2007).
3. Head
FirstHTMLandCSS,ElisabethRobson,EricFreeman,O'ReillyMediaInc.
4. AnIntroductiontoHTMLandJavaScript:forScientistsandEngineers,DavidR.Brooks.Springer, 2007
5. Schaum'sEasyOutlineHTML, DavidMercer,Mcgraw HillProfessional.
6. WordpressforBeginners,Dr.AndyWilliams.
7. Professionalwordpress,BradWilliams,Daviddamstra,Hanstern.
8. Webresources:
 - a. <http://www.codecademy.com/tracks/web>
 - b. <http://www.w3schools.com>
 - c. <https://www.w3schools.in/wordpress-tutorial/>
 - d. <http://www.homeandlearn.co.uk>

SRI VENKATESWARA UNIVERSITY
B.Sc. DEGREE COURSE IN COMPUTER SCIENCE
SEMESTER SYSTEM WITH CBCS
SEMESTER V
W.E.F. 2022-2023
COURSE6A: WEB INTERFACE DESIGNING TECHNOLOGIES
PRACTICAL SYLLABUS

V. Learning Outcomes:

On successful completion of this practical course, students shall be able to:

1. Create a basic website with the help of HTML and CSS.
2. Acquire the skill of installing WordPress and various plugins of WordPress.
3. Create a static website with the help of WordPress.
4. Create an interface for a dynamic website.
5. Apply various themes for their websites using WordPress.

VI. Practical (Laboratory) Syllabus:

(30hrs.)

HTML and CSS:

1. Create an HTML document with the following formatting options:

- (a) Bold, (b) Italics, (c) Underline, (d) Headings (Using H1 to H6 heading styles), (e) Font (Type, Size and Color), (f) Background (Colored background/ Image in background), (g) Paragraph, (h) Line Break, (i) Horizontal Rule, (j) Pre tag

2. Create an HTML document which consists of:

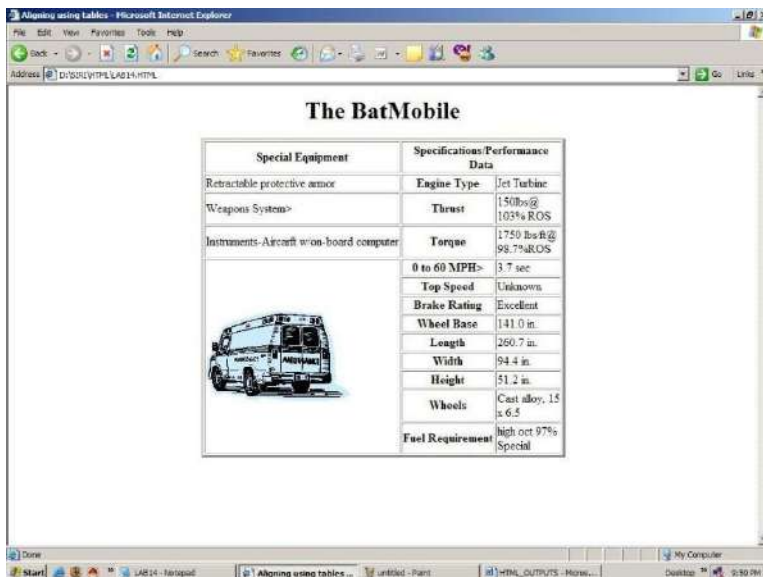
- (a) Ordered List (b) Unordered List (c) Nested List (d) Image

3. Create a Table with four rows and five columns. Place an image in one column.

4. Using "table" tag, align the images as follows:



5. Create a menu form using HTML.
6. Style the menu buttons using CSS.
7. Create a form using HTML which has the following types of controls:
 - (a) TextBox
 - (b) Option/radio buttons
 - (c) Checkboxes
 - (d) Reset and Submit buttons
8. Embed a calendar object in your webpage.
9. Create an applet that accepts two numbers and performs all the arithmetic operations on them.
10. Create a nested table to store your curriculum.
11. Create a form that accepts the information from the subscriber of a mailing system.
12. Design the page as follows:



13. Create a help file as follows:



14. Create a webpage containing your biodata (assume the form and fields).
15. Write an HTML program including style sheets.
16. Write an HTML program to layers of information in a webpage.
17. Create a static webpage.

Word press:

18. Installation and configuration of word press.
 19. Create a site and add a theme to it. 20. Create a child theme
 21. Create five pages on COVID-19 and link them to the homepage.
 22. Create a simple post with a featured image.
 23. Add an external video link with size 640X 360.
 24. Create a user and assign a role to him.
 25. Create a login page to word press using custom links
 26. Create a website for your college.
-

SRI VENKATESWARA UNIVERSITY
B.Sc. DEGREE COURSE IN COMPUTER SCIENCE
SEMESTER SYSTEM WITH CBCS

SEMESTER V
W.E.F. 2022-2023

*Skill Enhancement Courses (SECs) for Semester V,
from 2022-23 (Syllabus with Learning Outcomes, References,
Co-curricular Activities)*

Course Code:
Max Marks: 100+50

Course 7A: Web Applications Development using PHP & MYSQL

(Skill Enhancement Course (Elective), Credits: 05)

I. Learning Outcomes:

Students after successful completion of the course will be able to:

1. Write simple programs in PHP.
2. Understand how to use regular expressions, handle exceptions, and validate data using PHP.
3. Apply In-Built functions and Create User defined functions in PHP programming.
4. Write PHP scripts to handle HTML forms.
5. Write programs to create dynamic and interactive web based applications using PHP and MySQL.
6. Know how to use PHP with a MySQL database and can write database driven web pages.

II. Syllabus: (Total Hours: 90 including Teaching, Lab, and Field training, Unit tests etc.)

Unit-1: (10 hours)

The Building blocks of PHP: Variables, Data Types, Operators and Expressions, Constants. Flow Control Functions in PHP: Switching Flow, Loops, Code Blocks and Browser Output. Working with Functions: What is function?, Calling functions, Defining Functions, Returning the values from User-Defined Functions, Variable Scope, Saving state between Function calls with the static statement, more about arguments.

Unit-2: (10 hours)

Working with Arrays: What are Arrays? Creating Arrays, Some Array-Related Functions. Working with Objects: Creating Objects, Object Instance Working with Strings, Dates and Time: Formatting strings with PHP, Investigating Strings with PHP, Manipulating Strings with PHP, Using Date and Time Functions in PHP.

Unit-3: (10hours)

Working with Forms: Creating Forms, Accessing Form Input with User defined Arrays, Combining HTML and PHP code on a single Page, Using Hidden Fields to save state, Redirecting the user, Sending Mail on Form Submission, and Working with File Uploads. Working with Cookies and User Sessions: Introducing Cookies, Setting a Cookie with PHP, Session Function Overview, Starting a Session, Working with session variables, passing session IDs in the QueryString, Destroying Sessions and Unsetting Variables, Using Sessions in an Environment with Registered Users.

Unit-4: (10hours)

Working with Files and Directories: Including Files with include(), Validating Files, Creating and Deleting Files, Opening a File for Writing, Reading or Appending, Reading from Files, Writing or Appending to a File, Working with Directories, Open Pipe to and from Process Using popen(), Running Commands with hexec(), Running Commands with system() or passthru(). Working with Images: Understanding the Image-Creation Process, Necessary Modifications to PHP, Drawing a New Image, Getting Fancy with Pie Charts, Modifying Existing Images, Image Creation from User Input.

Unit-5: (10hours)

Interacting with MySQL using PHP: MySQL Versus MySQLi Functions, Connecting to MySQL with PHP, Working with MySQL Data. Creating an Online Address Book: Planning and Creating Database Tables, Creating Menu, Creating Record Addition Mechanism, Viewing Records, Creating the Record Deletion Mechanism, Adding Sub-entities to a Record.

III. References

1. Julie C. Meloni, SAMSTeachyourselfPHPMySQLandApache, Pearson Education (2007).
2. Steven Holzner, PHP: The Complete Reference, McGraw-Hill
3. Robin Nixon, Learning PHP, MySQL, JavaScript, CSS & HTML5, Third Edition on O'Reilly, 2014
4. Xue Bai Michael Ekedahl, The web warrior guide to Web Programming, Thomson (2006).
5. Web resources:
 - e. <http://www.codecademy.com/tracks/php>
 - f. <http://www.w3schools.com/PHP>
 - g. <http://www.tutorialpoint.com>
6. Other web sources suggested by the teacher concerned and the college librarian including reading material.

SRI VENKATESWARA UNIVERSITY
B.Sc. DEGREE COURSE IN COMPUTER SCIENCE
SEMESTER SYSTEM WITH CBCS

SEMESTER V

W.E.F. 2022-2023

COURSE 7A: WEB APPLICATIONS DEVELOPMENT USING PHP & MYSQL –

PRACTICAL SYLLABUS

V. Learning Outcomes:

On successful completion of this practical course, students shall be able to:

1. Write, debug and implement the Programs by applying concepts and error handling techniques of PHP.
2. Create an interactive and dynamic website.
3. Create a website with reports generated from a database.
4. Write programs to create an interactive website for e-commerce sites like online shopping, etc.

VI. Practical (Laboratory) Syllabus:

(30hrs.)

1. Write a PHP program to Display "Hello"
2. Write a PHP Program to display the today's date.
3. Write a PHP program to display Fibonacci series.
4. Write a PHP Program to read the employee details.
5. Write a PHP program to prepare the student marks list.
6. Write a PHP program to generate the multiplication of two matrices.
7. Create student registration form using text box, checkbox, radio button, select, submit button. And display user inserted value in new PHP page.
8. Create Website Registration Form using text box, checkbox, radio button, select, submit button. And display user inserted value in new PHP page.
9. Write PHP script to demonstrate passing variables with cookies.
10. Write a program to keep track of how many times a visitor has loaded the page.
11. Write a PHP application to add new Rows in a Table.
12. Write a PHP application to modify the Rows in a Table.
13. Write a PHP application to delete the Rows from a Table.
14. Write a PHP application to fetch the Rows in a Table.
15. Develop a PHP application to implement the following Operations

- i. Registration of Users.
- ii. Insert the details of the Users.
- iii. Modify the Details.
- iv. Transaction Maintenance.
 - a) No of times Logged in
 - b) Time Spent on each login.
 - c) Restrict the user for three trials only.
 - d) Delete the user if he spent more than 100 Hrs of transaction.
16. Write a PHP script to connect MySQL server from your website.
17. Write a program to read customer information like cust-no, cust-name, item-purchased, and mob-no, from customer table and display all these information in table format on output screen.
18. Write a program to edit name of customer to "Kiran" with cust-no =1, and to delete record with cust-no=3.
19. Write a program to read employee information like emp-no, emp-name, designation and salary from EMP table and display all this information using table format in your website.
20. Create a dynamic web site using PHP and MySQL.