

BHAVAN'S VIVEKANANDA COLLEGE
OF SCIENCE, HUMANITIES AND COMMERCE
(Accredited with 'A' grade by NAAC)
Autonomous College
Affiliated to Osmania University




Bharatiya Vidya
Bhavan

Board of Studies

DEPARTMENT OF COMPUTER SCIENCE
(CBCS)

w.e.f. 2020 - 2021

Board of Studies OU Nominee


Associate Professor
Dept. of Maths O.U

Chairperson & Head of the Department


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BOS in Computer Science
Bhavan's Vivekananda College
Sainikpuri



Bharatiya Vidya
Bhavan

BHAVAN'S VIVEKANANDA COLLEGE OF SCIENCE, HUMANITIES AND COMMERCE

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Autonomous College

Affiliated to OSMANIA UNIVERSITY

Department of Computer Science

B.Sc Computer Science Subjects (CBCS)


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External Theory Exam (70 Marks) and Internal Theory Exam (30 Marks)

Practical External Assessment (25 marks)


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Department of Computer Science**

**PROGRAM NAME: B.Sc (CBCS) (w.e.f 2020-21)
COURSE NAME: PROGRAMMING IN 'C'**

**COURSE CODE: CS125
YEAR/SEMESTER: I/I**

**PPW: 4
NO. OF CREDITS: 4**

COURSE OBJECTIVE: To enable students with the concepts of 'C' programming to develop simple applications.

UNIT-WISE COURSE OBJECTIVES:

COB1: To discuss the Anatomy of a Computer, Program & Software Development, and Basics of 'C' language.

COB2: To illustrate different control and looping statements, arrays and strings with examples.

COB3: To explain the usage of functions, pointers.

COB4: To construct structures, unions, and Working with Text Files.

Unit-I: Computer Fundamentals, Program Fundamentals, Structured Programming Concept, Basics of C, C Tokens 15 Hrs.

Computer Fundamentals: Introduction of Computers, Classification of Computers, Anatomy of a Computer, Introduction to OS.

Program Fundamentals: Compiling, Interpreting, Loading and Linking of a Program, Software Development.

Structured Programming Concept: Top- down analysis, Modular programming.

Basics of C: Overview of C, Developing Programs in C: Writing, Compiling and executing the program. Parts of Simple C Program, Structure of a C Program, Comments, Program Statements. **C Tokens:** Keywords, Identifiers, Data Types, Variables, Constants, Operators and Expressions, Expression Evaluation—precedence and associativity, Type Conversions.

(Ch: 1(1.1, 1.4, 1.5, 1.7), 4(4.3, 4.6), 7(7.2), 8(8.1, 8.3, 8.6:8.9, 8.12, 8.13, 8.16))

Unit-II: Input-Output, Control Statements, Iterative Statements, Special Control Statement, One Dimensional Array, Two Dimensional Arrays, Character Arrays 15 Hrs.

Input-Output: Non-formatted and Formatted Input and Output Functions, Escape Sequences.

Control Statements: Selection Statements – if, if-else, nested if, nested if-else, conditional operator, switch.

Iterative Statements: while, for, do-while.

Special Control Statement: goto, break, continue, return, exit.

One Dimensional Array: Declaration, Initializing, Accessing, Working with one dimensional array.

Two Dimensional Arrays: Declaration of Two Dimensional Arrays, Working with two dimensional array.

Character Arrays: Declaration of a string, String Initialization, Printing Strings, String Input.

Functions from string.h (strlen(), strcat(), strcmp(), strlwr(),strupr()).

(Ch:9(9.3, 9.4), 10(10.4, 10.5, 10.7, 10.8), 11 (11.2, 11.3, 11.4.1, 11.4.6))

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Unit-III: Functions, Storage Classes, Pointers, Dynamic Memory Allocation**15 Hrs.**

Functions: Concept of Function: Need of Functions, Using Functions: Function Prototype declaration. Function definition, Function calling. Call-by-Value mechanism, Scope of Variables - Concept of Global and Local Variables.

Storage Classes: Storage class specifiers for Variables, Recursive Function.

Pointers: Introduction, Address of Operator (&), Pointer: Declaring a pointer, Initializing pointers, Indirection operator and dereferencing, Uses of Pointers, Call-by-Reference.

Dynamic Memory Allocation: Dynamic allocation of arrays(calloc(), malloc()), freeing memory (free()).

Note: Theory concept for Pointers and DMA.

(Ch:12(12.2:12.4 , 12.7:12.10),13(13.1, 13.3, 13.4, 13.17, 13.17.1, 13.17.2)

Unit-IV: User-Defined Data Types, Union and Enumeration Type, Files**15 Hrs.**

User-Defined Data Types: Declaring a Structure and its members, Initialization Structure, Accessing members of a Structure, Array of Structures, Nested Structures.

Union and Enumeration Type: Declaring a Union and its members, Initialization, Accessing members of a Union, Structures versus Unions, Enumeration Types.

Files: Introduction, Using Files: Declaration of file pointer, opening a file, closing a file, working with Text Files: Character Input and Output.

Note: Theory concept for files.

(Ch:14 (14.2.1:14.2.3 , 14.3 ,14.3.1:14.3.3 ,14.4),15(15.1,15.2,15.3)

Prescribed Book:

Pradip Dey, Manas Ghosh, Computer Fundamentals and Programming in C (2e)

References Books:

1. Ivor Horton, Beginning C
2. Herbert Schildt, The Complete Reference C
3. Paul Deitel, Harvey Deitel, C How To Program
4. Byron S. Gottfried, Theory and Problems of Programming with C
5. Brian W. Kernighan, Dennis M. Ritchie, The C Programming Language
6. B. A. Forouzan, R. F. Gilberg, A Structured Programming Approach Using C

COURSE OUTCOMES: At the end of the course students will be able to:

CS125 CO1: Be familiar with Anatomy of a Computer and develop basic programs in C.

CS125 CO2: Develop program using Control Statements, Looping Statements, Arrays and Strings concepts.

CS125 CO3: Write programs using Function and Pointers.

CS125 CO4: Apply the concepts of Structures, Unions, and Working with Text Files in C programs.

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**PROGRAM NAME: B.Sc (CBCS) (w.e.f 2020-21)
COURSE NAME: PROGRAMMING IN 'C' Lab**

**COURSE CODE: CS125P
YEAR/SEMESTER: I/I**


**PPW: 2
NO. OF CREDITS: 1**

1. Memory Hierarchy(Seminar)
2. Generation and Classification of Programming Languages,(Seminar).
3. Different Algorithms (Step-form, Pseudo-code, Flowchart) (Seminar) .
4. Write a program to demonstrate comma operator.
5. Write a program to find the largest of two numbers using if and conditional operator.
6. Write a program to calculate arithmetic operations of two numbers using switch.
7. Write a program to print the reverse of a given number.
8. Write a program to print whether the given number is a prime or not.
9. Write a program to find largest and smallest elements in a given list of numbers.
10. Write a program to find the sum of two matrices.
11. Write a program to find the product of two matrices.
12. Write a program to print the reverse of a given string.
13. Write a program to demonstrate any four functions of ctype.h.
14. Write a program to find the factorial of a positive integer using recursion.
15. Write a program to find the GCD of two positive integers using iteration.
16. Write a program to demonstrate the call by value and the call by reference concepts.
17. Write a program to demonstrate Passing Arrays to Functions.
18. Write a program to demonstrate Arrays and Pointers.
19. Write a program to demonstrate Pointers and Strings
20. Write a program to illustrate the use of Enumeration data type.
21. Write a program to illustrate the use of structure concept.
22. Write a program to illustrate the use of union concept.
23. Write a program to write content into a file and display contents of a file.
24. Write a program to copy content of one file into another file and display the content of new file.(Other File Management Functions :Deleting and renaming files).
25. Write a program to Demonstrate Binary files.

Note: Write the Pseudo Code and draw Flow Chart for the above programs.

Recommended to use Open Source Software: GCC on Linux; DevC++ (or) CodeBlocks on Windows 10.

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PROGRAM NAME: B.Sc (CBCS) (w.e.f 2020-21)
COURSE NAME: PROGRAMMING IN C++

COURSE CODE: CS225
YEAR/SEMESTER: I/II

PPW: 4
NO. OF CREDITS: 4

COURSE OBJECTIVE: To enable students with the concepts of object-oriented programming and develop simple applications.

UNIT-WISE COURSE OBJECTIVES:

COB1: To explain basic concepts like control statements, arrays, pointers and functions.

COB2: To explain the concepts of OOP, class definition, constructors and destructor.

COB3: To illustrate different programs on inheritance, polymorphism, virtual Functions and C++ streams.

COB4: To construct programs using templates and exception handling.

Unit-I: Introduction to C++, Control Structures, Arrays, Strings, Pointers, Functions 15 Hrs.

Introduction to C++: Applications, Example Programs.

Control Structures: if statement, if-else, if/else if, nested if, switch statement, while, do..while, for.

Arrays: Arrays hold multiple values, Accessing Array Elements, Inputting and Displaying Contents(using cin and cout), Array Initialization (One-Dimensional and Two-Dimensional).

Strings: using predefined string class.

Pointers: Pointer and the Address Operator, Pointer Variables, Initializing Pointers.

Functions: Introduction, Function Prototype, Passing Data by Value (Call by value), Reference Variables definition and simple example program.

(BOOK I: CH-2.1; CH-4.2,4.3,4.4,4.6,4.12; CH:5.2,5.5,5.6; CH-6.3,6.5,6.13; CH-8.1,8.2,8.3,8.4; CH:2.9; CH:10.1,10.2,10.5)

Unit-II: Object Oriented Programming, Classes, Constructors, Polymorphism 15 Hrs.

Object Oriented Programming: Procedural Programming versus Object-Oriented Programming, Terminology, Benefits, OOP Languages, and OOP Applications.

Classes: Introduction, Defining an Instance of a Class, Why Have Private Members? Private Member Functions, Inline Member Functions.

Constructors: Default Constructor, Passing Arguments to Constructors(Parameterized Constructors), Copy Constructors, Destructors, Arrays of Objects.

Polymorphism: Overloading Functions, Overloading Constructors, Operator Overloading (Overloading prefix ++ Operator, Overloading postfix – Operator).

(BOOK I:CH-7.2,7.3,7.4,7.5,7.6,7.7,7.8;CH:11.5; CH-6.14;CH:11.6)

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Unit-III: Inheritance, Constructors and Destructors, C++ Streams**15 Hrs**

Inheritance: Introduction, Protected Members and Class Access: Base Class Access Specification, Single Inheritance, Multi-level Inheritance, Multiple Inheritance, Hierarchical Inheritance.

Constructors and Destructors: Constructors and Destructors in Base and Derived Classes (with default constructors), Redefining Base Class Functions(Overriding Base Class Functions), Polymorphism and Virtual Member Functions(Simple example program).

C++ Streams: Stream Classes, Formatted I/O Operations.

(BOOK I: CH- 11.10, 11.11, 11.12, 11.13; CH- 15.2; BOOK II: CH-20-PG NO.511;

BOOK I: CH- 3.1; BOOK II: CH-20-PG NO.513)

Unit – IV: Exceptions, Templates**15 Hrs**

Exceptions: Introduction, Throwing an Exception, Handling an Exception, Object-Oriented Exception Handling with Classes, Multiple Exceptions, Re-throwing an Exception.

Templates: Function Templates–Introduction, Function Templates with Multiple Type, Overloading with Function Templates, Class Templates-Introduction, Defining Objects of the Class Template.

(BOOK I: CH- 16.1; CH-16.2, 16.3)

Prescribed books:

- 1 Tony Gaddis, Starting out with C++: from control structures through objects (7e)
- 2 Herbert Schildt, C++: The Complete Reference

Reference Books:

- 1 B. Lippman, C++ Primer
- 2 Bruce Eckel, Thinking in C++
- 3 K.R. Venugopal, Mastering C++
- 4 Bjarne Stroustrup, The C++ Programming Language
- 5 Sourav Sahay, Object Oriented Programming with C++

COURSE OUTCOMES: At the end of the course students will be able to:

CS225CO1: Develop simple programs using conditional statements, pointers and functions.

CS225CO2: Illustrate the concepts of classes, constructors and destructors

CS225CO3: Implement inheritance and polymorphism concepts in programs.

CS225CO4: Apply the concepts of templates and exception handling.

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**PROGRAM NAME: B.Sc (CBCS) (w.e.f 2020-21)
COURSE NAME: PROGRAMMING IN 'C++' Lab**


**COURSE CODE: CS225P
YEAR/SEMESTER: I/II**

**PPW: 2
NO. OF CREDITS: 1**

1. Write a program to print the sum of digits of a given number.
2. Write a program to check whether the given number is Armstrong or not.
3. Write a program to check whether the given string is Palindrome or not.
4. Write a program to implement
 - a) Linear Search
 - b) Bubble Sort
5. Write a program to demonstrate Reference Variables as Parameters.
6. Write a program to demonstrate Passing Arrays to Functions.
7. Write a program to read student name, roll no, marks and display the same using class and object (Separating Class Specification from Implementation example).
8. Write a program to find area of a rectangle, circle, and square using class and object.
9. Write a program to implement inline function inside and outside of a class
 - a) Finding the area of a square
 - b) Finding the area of a cube
10. Write a program to implement friend function and friend class.
11. Write a program to demonstrate
 - a) Instance and Static Members
 - b) Member-wise Assignment
12. Write a program to implement constructor and destructor with in a class (Constructor Overloading and Constructor with Default Arguments).
13. Write a program to demonstrate hierarchical inheritance.
14. Write a program to demonstrate multiple inheritances.
15. Write a program to demonstrate the operator overloading.
16. Write a program to demonstrate static polymorphism.
17. Demonstrate Object Conversion and Aggregation (Seminar).
18. Write a program to demonstrate dynamic polymorphism.
19. Write a program to demonstrate Abstract Base Classes.
20. Write a program to implement polymorphism using pure virtual functions.
21. Write a program to demonstrate unformatted I/O operations (cin, cout, get(), put(), getline(), write()).
22. Write a program to demonstrate the function templates and class templates.
23. Write a program to demonstrate exception handling using try, catch, and finally.
24. Demonstrate bad_alloc Exception, Extracting Data from the Exception (Seminar).
25. Write a program to demonstrate for Re-throwing an Exception.
26. Write a program to demonstrate Class Templates and Inheritance.
27. Demonstrate STL (Seminar).

Recommended to use Open Source Software: GCC on Linux; DevC++ (or) CodeBlocks on Windows.

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Department of Computer Science

PROGRAM NAME: B.Sc.(Computer Science)
(w.e.f. 2021-22)

COURSE NAME: Data Structures

COURSE CODE: CS325

P.P.W: 4

YEAR/SEMESTER: II/III

NO.OF. CREDITS:4

COURSE OBJECTIVE: To familiarize the students with concepts of Data Structures using C++ language.

UNIT-WISE COURSE OBJECTIVES:

COB1: To impart knowledge on Data Structures and Recursion.

COB2: To demonstrate the operations of Queues and Linked Lists.

COB3: To discuss the concepts of Trees, Sorting and Searching.

COB4: To exemplify the concepts of Graphs, Hashing and Heap.

Unit-I: Basic Data Structure, Stacks and Recursion

15 Hrs.

Basic Data Structure: Introduction to Data Structures, Types of Data Structures and Introduction to Algorithms, Pseudo code- Definition. Relationship among data, data structures and algorithms, Implementation of data structures.

Stacks: Concept of Stacks, Stack Abstract Data Type, Representation of Stacks Using Sequential Organization (Arrays), Applications of Stack, Processing of Function Calls, Reversing a String with a Stack

Recursion: Introduction, Use of Stack in Recursion, Recursive Functions, Iteration versus Recursion.
(Ch: 1.3-1.8, Ch:3.2,3.3,3.4,3.7,3.9,3.10, Ch:4.1,4.3,4.6,4.7)

Unit -II: Queues and Linked Lists

15 Hrs.

Queues: Concept of Queues, Queue as Abstract Data Type, Realization of Queues Using Arrays, Deque-Definition, Priority Queue- Array implementation of priority queue, Applications of Queues- Josephus problem.

Linked Lists: Introduction, Linked List, Linked List Abstract Data Type, Linked List Variants, Doubly Linked List, Circular Linked List-Definition, Linked Stack, Linked Queue.

(Ch:5.1,5.2,5.3,5.6,5.7,5.8(5.8.1), Ch:6.1.6.2,6.5,6.6,6.7,6.8,6.11,6.12)

Unit –III: Trees, Searching and Sorting

15 Hrs.

Trees: Introduction, Types of Trees, Binary Tree-Definition, Binary Tree Abstract Data Type, Insertion of a Node in Binary Tree, Binary Tree Traversal-Traversal techniques.

Searching and Sorting: Search Techniques-Linear Search (Sequential Search), Binary Search, Sorting Techniques- Selection Sort, Bubble Sort, Insertion Sort, Quick Sort.

(Ch:7.1,7.2,7.3,7.4,7.6,7.7(7.7.1,7.7.2,7.7.3), Ch 9.2(9.2.1,9.2.2),9.3(9.3.3,9.3.4,9.3.5,9.3.6)

Unit –IV: Graphs, Hashing and Heaps

15 Hrs.

Graphs: Introduction, Representation of Graphs-Adjacency Matrix, Adjacency List, Graph Traversal – Depth -First Search, Breadth -First Search, Spanning Tree-Connected Components, Kruskal's Algorithm.

Hashing: Introduction, Key Terms and Issues.

Heaps: Basic Concepts, Implementation of Heap, Heap as Abstract Data Type, Heap Sort, Heap Applications.

(Ch:8.1,8.3(8.3.1,8.3.2) ,8.4,8.5(8.5.1,8.5.3), (Ch:11.1,11.2, Ch:12.1,12.2,12.3,12.4,12.5)

Prescribed Books:

1. Varsha H. Patil "Data structures using C++" Oxford University press, 2012

References:

1. M.T. Goodrich, R. Tamassia and D. Mount, Data Structures and Algorithms in C++, John Wiley and Sons, Inc., 2011
2. Adam Drozdek "Data structures and algorithm in C++" Second edition, 2001
3. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, Introduction to Algorithms, 2nd Ed., Prentice-Hall of India, 2006
4. Robert L. Kruse and A.J. Ryba, Data Structures and Program Design in C++, Prentice Hall, Inc., NJ, 1998
5. B. Stroustrup, The C++ Programming Language, Addison Wesley, 2004
6. D.E. Knuth, Fundamental Algorithms (Vol. I), Addison Wesley, 1997

COURSE OUTCOMES: By the end of the course students will be able to:

CO1: Acquire knowledge of Data Structures and Stacks.

CO2: Implement the operations of Queues and Linked Lists.

CO3: Comprehend the concepts of Trees, Sorting and Searching.

CO4: Deduce the concepts of Graphs, Hashing and Heap.



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Department of Computer Science

PROGRAM NAME: B.Sc.(Computer Science)
(w.e.f. 2021-22)

COURSE NAME: Data Structures Using C++ Lab

COURSE CODE: CS325P

P.P.W: 2

YEAR/SEMESTER: II/III

NO. OF CREDITS: 1

COURSE OBJECTIVE: To enable students with the knowledge of Searching and Sorting techniques, Linear and Non-Linear Data Structures.

Cob1: To implement C++ Programs for Searching and Sorting Techniques.

Cob2: To implement C++ Programs for Linear Data structures and Non-Linear Data Structures.

Week 1:

1. Write a C++ programs to implement the following using an array.
 - i. a) Stack ADT b) Queue ADT

Week 2:

2. Write a C++ program to convert infix expression to postfix expression and vice versa.

Week 3:

3. Write a C++ program to implement Circular queue using array.
4. Write a C++ programs to implement the following using a single linked list.
 - a) Stack ADT b) Queue ADT

Week 4:

5. Write a C++ program to implement Circular queue using Single linked list.
6. Write a C++ program to implement the double ended queue ADT using double linked list.

Week 5:

7. Write a C++ program to solve tower of Hanoi problem recursively.
8. Write a C++ program to perform the following operations:
 - i. a) Insert an element into a binary search tree.
 - ii. b) Delete an element from binary search tree.
 - iii. c) Search for a key in a binary search tree.

Week 6:

9. Write a C++ programs for the implementation tree traversal technique BFS.
10. Write a C++ program that uses recursive functions to traverse a binary search tree.
 - i. a) Pre-order b) In-order c) Post-order
 - ii.

Week 7:

11. Write a C++ program to find height of a tree.
12. Write a C++ program to find MIN and MAX element of a BST.

Week 8:

13. Write a C++ program to find in Order Successor of a given node.
14. Write a C++ programs to perform the following operations on B-Trees and AVL Trees.
 - i. a) Insertion b) Deletion

Week 9:

15. Write a C++ programs for sorting a given list of elements in ascending order using the following sorting methods.
 - i. a) Quick sort b) Merge sort
16. Write a C++ program to find optimal ordering of matrix multiplication.

Week 10:

17. Write a C++ program that uses dynamic programming algorithm to solve the optimal binary search tree problem
18. Write a C++ program to implement Hash Table.

Week 11:

19. Write a C++ programs to perform the following on Heap.
 - i. a) Build Heap b) Insertion c) Deletion

Week 12:

20. Write a C++ programs to perform following operations on Skip List. a) Insertion b) Deletion

Week 13:

21. Write a C++ Program to Create a Graph using Adjacency Matrix Representation.
22. Write a C++ program to implement graph traversal techniques.
 - a) BFS b) DFS


Week 14:

23. Write a C++ program to Heap sort using tree structure.

COURSE OUTCOMES: By the end of the practical course students will be able to:

CO1: Execute Searching and Sorting Techniques using C++.

CO2: Execute Linear Data Structures and Non- Linear Data Structures using C++.


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PROGRAM NAME: B.Sc.(Computer Science)
(w.e.f. 2021-22)

COURSE NAME: Basics of Python
Skill Enhancement Course (SEC- 1)

COURSE CODE: SE325A

P.P.W:2

YEAR/SEMESTER: II/III

NO.OF CREDITS:2

COURSE OBJECTIVE: To help the students familiarize the concepts of Python.

UNIT-WISE COURSE OBJECTIVES:

COb1: To impart knowledge on basics of Python and decision structures.

COb2: To demonstrate functions, files and exceptions.

Unit – I: Introduction to Python Programming, Decision Structures and Boolean Logic, Repetition Structures **15 hrs.**

Introduction to Python Programming: How a Program Works, Using Python, Program Development Cycle. **Input, Processing, and Output:** Displaying Output with the Print Function, Comments, Variables, Reading Input from the Keyboard, Performing Calculations (Operators, Type conversions, Expressions), More about Data Output.

Decision Structures and Boolean Logic: if, if-else, if-elif-else Statements, Nested Decision Structures, Comparing Strings, Logical Operators, Boolean Variables.

Repetition Structures: Introduction, while loop, for loop, Calculating a Running Total, Input Validation Loops, Nested Loops. **(Ch:1,2,3,4)**

Unit – II: Functions, Files and Exceptions **15 hrs.**

Functions: Introduction, Defining and Calling a Void Function, designing a Program to Use Functions, Local Variables, Passing Arguments to Functions, Global Variables and Global Constants, Value-Returning Functions- Generating Random Numbers, Writing Our Own Value-Returning Functions, the math Module, Storing Functions in Modules.

Files and Exceptions: Introduction to File Input and Output, Using Loops to Process Files, Processing Records, Exceptions. **(Ch:5,6)**

Prescribed Book:

1. Tony Gaddis, Starting Out with Python (3e)

Reference Books:

1. Kenneth A. Lambert, Fundamentals of Python
2. Clinton W. Brownley, Foundations for Analytics with Python
3. James Payne, Beginning Python using Python 2.6 and Python3
4. Charles Dierach, Introduction to Computer Science using Python
5. Paul Gries, Practical Programming: An Introduction to Computer Science using Python3

COURSE OUTCOMES: By the end of the course students will be able to:

CO1: Execute basic programs in Python.

CO2: Implement functions, files and exceptions.

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**PROGRAM NAME: B.Sc.(Computer Science)
(w.e.f. 2021-22)**

**COURSE NAME: PC Maintenance
Skill Enhancement Course (SEC- 2)**

COURSE CODE: SE325B

P.P.W: 2

YEAR/SEMESTER: II/III

NO. OF CREDITS: 2

COURSE OBJECTIVE: To help the students familiarize the components of PC and Maintenance of PC.

UNIT-WISE COURSE OBJECTIVES:

COB1: To identify PC Components, Features, System Design, Motherboards and Bus.

COB2: To correlate the importance of Memory, Hard Disk Storage, Building or Upgrading Systems of a PC, Testing and Maintenance.

UNIT-I: PC Components, Features, System Design, Motherboards and Buses 15 Hrs.

PC Components, Features and System Design: What is a PC, Who Controls PC Software, Who Controls PC Hardware, PC Design Guides, System Types, and System Components.

Processor Types and Specifications: Microprocessor History, Processor, Processor Socket and Slot Types, Intel Family: Intel P6 (686) Processors, Pentium III, Celeron, Intel Pentium 4 Processors, Pentium 4 Extreme Edition, Intel Core Processors, Others: AMD K6 Processors, AMD K7 Processors, AMD K8 Processors.

Motherboards and Buses: Motherboard Form Factors, Chipsets (Intel Chipsets, North/South Bridge Architecture, Fifth-Generation (P5 Pentium Class) Chipsets, Sixth-Generation (P6 Pentium Pro/II/III Class) Chipsets, Seventh/Eighth-Generation (Pentium 4/D, Core 2, and Core i) Chipsets, Third-Party Chipsets for Intel Processors, Chipsets for AMD Processors), Motherboard Connectors, System Bus Types, Types of I/O Buses. (Ch-2, 3, 4)

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Practicals:

1. Identifying external ports and interfacing of peripherals (Such as Monitor, Keyboard, Mice, Speakers, Printers, Modem)
2. Identifying PC cards such as memory board, display card, NIC card and Sound Blaster card.
3. Identifying the ports on cards.

UNIT-II: Memory, Power Supplies, Input Devices, Hard Disk Storage, Building or Upgrading Systems and PC Diagnostics, Testing and Maintenance 15 Hrs.

Memory: Memory Basics, Memory Standards, Memory Modules, Memory Banks.

Power Supplies: The Power Supply, Primary Function and Operation, Power Supply Form Factors, Power Switches, Motherboard Power Connectors.

Input Devices: Keyboards, Optical Mice, Pointing Device Interface Types, Wireless Input Devices.

Hard Disk Storage: Hard Drive Advancements, Form Factors, Basic HDD Components.

Building or Upgrading Systems: System Components, System Assembly and Disassembly, Installing the OS, Troubleshooting New Installations.

PC Diagnostics, Testing, and Maintenance: PC Diagnostics, Diagnostics Software, Peripheral Diagnostics, Operating System Diagnostics, Commercial Diagnostics Software, Free/User Supported Diagnostics, The Boot Process, Booting from Optical or Floppy, PC Maintenance Tools.

(Ch-6, 18, 15, 9, 19, 20)

Practicals:

1. Interfacing Hard disks.
2. Disassembling and assembling of PC
3. Preventive maintenance of PC
4. Understanding of CMOS setup
5. Loading windows operating system and device drivers
6. Installation of application software

Prescribed Book:

1. Scott Mueller –*Upgrading and repairing PCs*–20th Edition, QUE (PHI) –2011.

Reference Books:

1. IBM PC Clones by Govindarajalu, 2nd edition, McGraw-Hill education, 2008.
2. PC Upgrade & Repair Black Book by Ron Gilster.

COURSE OUTCOMES: By the end of the course students will be able to:

CO1: Identify PC Components, Features, System Design, Motherboards and Bus.

CO2: Comprehend the importance of Memory, Building or Upgrading Systems and PC Diagnostics, Testing and Maintenance.



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Department of Computer Science

PROGRAM NAME: B.Sc.(Computer Science)
(w.e.f. 2021-22)
COURSE NAME: Database Management Systems.

COURSE CODE:CS425

P.P.W:4

YEAR/SEMESTER: II/IV

NO. OF CREDITS:4

Course Objectives:

- COB1: To impart the basic concepts of database**
- COB2: To discuss Entity-Relation approach of data modeling**
- COB3: To study the relational model and Normalization.**
- COB4: To discuss Transaction Management concepts**

Unit 1:

Introduction to Databases:

15 Hrs

Database-System Applications; Purpose of Database Systems; View of Data-Data Abstraction, Instances and Schemas, Data Models; Database Languages- Data Manipulation Language, Data- Definition Language; Database Access from Manipulation Programs; Data Storage and Querying- Storage Manager, The Query Processor, Database Architecture; Database Users and Administrators.

Introduction to the Relational Model: Structure of Relational Databases; Database Schema; Keys; Schema Diagrams; Relational Query Languages; Relational Operations.

(Book 1: Ch: 1, 2)

Unit- II :Database Design and the E-R Model:

15 Hrs

Overview of the Design Process- Design Phases, Design Alternatives; The Entity-Relationship Model- Entity Sets, Relationship Sets, Attributes; Constraints – Mapping Cardinalities, Participation Constraints, Keys; Entity-Relationship Diagrams- Basic Structure, Mapping Cardinality, Complex Attributes; Reduction to Relational Schemas- Representation of Strong Entity Sets with simple attributes, Representation of Strong Entity Sets with complex attributes, Representation of Weak Entity Sets, Representation of Relationship Sets.

(Book 1: Ch: 7)

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Unit- III: Extended ER Model and Normalization:

15 Hrs

Extended E-R Features – Specialization, Generalization, Attribute Inheritance, Constraints on Generalization, Aggregation, Reduction to Relation Schemas-Representation of Generalization, Representation of Generalization, Representation of Aggregation.

Relational Database Design: Features of Good Relational Designs- Design Alternative :Larger Schemas, Design Alternative: Smaller Schemas; Atomic Domains and First Normal Form; Decomposition Using Functional Dependencies- Keys and Functional Dependencies, Boyce-Codd Normal Form, BCNF and Dependency Preservation, Third normal Form, Database Design Process.

(Book 1; ch: 7, 8)

Unit- IV: Security ,Transaction Management and Recovery:

15 Hrs

Database Security: Threats, Computer-Based Controls – Authorization, Access Controls- Discretionary Access Control (DAC), Mandatory Access Control (MAC), RAID (0, 1, 0+1)

Transaction Management: Transaction Support- Properties of a transaction, Concurrency Control- The Need for Concurrency Control, Serializability and Recoverability((Definition of Conflict Serializability, Definition of View Serializability), Locking Methods- 2PL(Definition of 2-Phase Locking Protocol), Deadlock- Deadlock prevention, Deadlock detection, Recovery from deadlock detection, Timestamping Methods- Thomas's Write Rule, Granularity of data Items(only Introduction), Database Recovery- The Need for Recovery, Recovery Facilities, Recovery Techniques

(Book 2; Ch :20, 22)

Prescribed Books:

1. Silberschatz, H. Korth and S. Sudarshan, Database System Concepts, 7th Ed., Tata McGraw Hill, 2017
2. Thomas M. Connolly, Carolyn E. Begg, Database Systems–A Practical Approach to Design, Implementation, and Management (6e)

Course Outcomes: Student will be able to


CO1: Understand the basic concepts of Database

CO2: Familiarize the Entity-Relation approach of Data Modeling

CO3: To gain knowledge of the Relational Model and Normalization.

CO4: To understand Transaction Management concepts


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Affiliated to Osmania University

PROGRAM NAME: B.Sc.(Computer Science)

(w.e.f. 2021-22)

COURSE NAME: Database Management Systems Lab

COURSE CODE: CS425P

P.P.W: 2

YEAR/SEMESTER: II/IV

NO. OF CREDITS: 1

Course Objective: To acquire knowledge on SQL Commands, SQL Operators, Joins, Stored Procedures and Triggers.

COB1: To impart basic concepts of SQL

COB2: To get equipped with the concepts of Joins, nested queries, views, Triggers and Stored Procedures

Week 1:

1. SQL Data types

Week 2:

2. Data Definition Language, Data Manipulation Language
3. Data Control Language

Week 3:

4. Group By and Order By Clauses
5. Set Operators

Week 4:

6. Joins (Cartesian, Equi)

Week 5:

7. Joins (Outer, Self)

Week 6:

8. Create a database having two tables with the specified fields, to computerize a library system of a University College. Library Books (Accession number, Title, Author, Department, Purchase Date, Price), Issued Books (Accession number, Borrower)

- a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.
- b) Delete the record of book titled "Database System Concepts".
- c) Change the Department of the book titled "Discrete Maths" to "CS".
- d) List all books that belong to "CS" department.

- e) List all books that belong to “CS” department and are written by author “Navathe”.
- f) List all computer (Department=“CS”) that have been issued.
- g) List all books which have a price less than 500 or purchased between “01/01/1999” and “01/01/2004”.

Week 7:

9. Create a database having three tables to store the details of students of Computer Department in your college. Personal information about Student (College roll number, Name of student, Date of birth, Address, Marks (rounded off to whole number) in percentage at 10 + 2, Phone number) Paper Details (Paper code, Name of the Paper) Student’s Academic and Attendance details (College roll number, Paper Code, Attendance, Marks in home examination).
 - a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.
 - b) Design a query that will return the records (from the second table) along with the name of student from the first table, related to students who have more than 75% attendance and more than 60% marks in paper2.
 - c) List all students who live in “Warangal” and have marks greater than 60 in paper1.
 - d) Find the total attendance and total marks obtained by each student.
 - e) List the name of student who has got the highest marks in paper2.

Week 8:

10. Create the following tables and answer the queries given below: Customer (CustID, email, Name, Phone, ReferrerID) Bicycle (BicycleID, DatePurchased, Color, CustID, ModelNo) BicycleModel (ModelNo, Manufacturer, Style) Service (StartDate, BicycleID, EndDate)
 - a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.
 - b) List all the customers who have the bicycles manufactured by manufacturer “Honda”.
 - c) List the bicycles purchased by the customers who have been referred by Customer “C1”.
 - d) List the manufacturer of red colored bicycles.
 - e) List the models of the bicycles given for service.

Week 9:

11. Create the following tables, enter at least 5 records in each table and answer the queries given below. Employee (Person_Name, Street, City) Works (Person_Name, Company_Name, Salary) Company (Company_Name, City) Manages (Person_Name, Manager_Name)
 - a) Identify primary and foreign keys.
 - b) Alter table employee, add a column “email” of type varchar (20).
 - c) Find the name of all managers who work for both Samba Bank and NCB Bank.
 - d) Find the names, street address and cities of residence and salary of all employees who work for “Samba Bank” and earn more than \$10,000.
 - e) Find the names of all employees who live in the same city as the company for which they work.
 - f) Find the highest salary, lowest salary and average salary paid by each company.

- g) Find the sum of salary and number of employees in each company.
- h) Find the name of the company that pays highest salary.

Week 10:

12. Create the following tables, enter at least 5 records in each table and answer the queries given below. Suppliers (SNo, Sname, Status, SCity) Parts (PNo, Pname, Colour, Weight, City) Project (JNo, Jname, Jcity) Shipment (Sno, Pno, Jno, Qunatity)
- a) Identify primary and foreign keys.
 - b) Get supplier numbers for suppliers in Paris with status>20.
 - c) Get suppliers details for suppliers who supply part P2. Display the supplier list in increasing order of supplier numbers.
 - d) Get suppliers names for suppliers who do not supply part P2.
 - e) For each shipment get full shipment details, including total shipment weights.
 - f) Get all the shipments where the quantity is in the range 300 to 750 inclusive.
 - g) Get part nos. for parts that either weigh more than 16 pounds or are supplied by suppliers S2, or both.
 - h) Get the names of cities that store more than five red parts.
 - i) Get full details of parts supplied by a supplier in Hyderabad.
 - j) Get part numbers for part supplied by a supplier in Warangal to a project in Chennai.
 - k) Get the total number of projects supplied by a supplier (say, S1).
 - l) Get the total quantity of a part (say, P1) supplied by a supplier (say, S1).

Week 11:

13. Write a PL/SQL Program to demonstrate Procedure.

Week 12:

14. Write a PL/SQL program to Handle Exceptions.

Week 13:

15. Write a PL/SQL Program to perform a set of DML Operations.

Week 14:

16. Write a PL/SQL Program to demonstrate Trigger.

Course Outcomes:

By the end of the course, Students will be able to:

CO1: Execute various SQL commands and operators.

CO2: Practice SQL functions, Joins, nested queries and views. Triggers and Stored Procedures of PL/SQL.



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Department of Computer Science

PROGRAM NAME: B.Sc.(Computer Science)
(w.e.f. 2021-22)

COURSE NAME: Python
Skill Enhancement Course (SEC - 3)

COURSE CODE: SE425A

P.P.W:2

YEAR/SEMESTER: II/IV

NO. OF CREDITS:2

COURSE OBJECTIVE: To enable students develop programs through Python Scripts.

UNIT-WISE COURSE OBJECTIVES:

COB1: To describe the functionalities of Lists, Tuples, Strings, Dictionaries and Sets.

COB2: To illustrate Object- Oriented Concepts and GUI Controls.

UNIT-I: Introduction to Python Programming, Lists and Tuples, Strings, Sets. 15Hrs.

Introduction to Python Programming: How a Program Works, Using Python, Program Development Cycle, **Input, Processing, and Output:** Displaying Output with the Print Function, Comments, Variables, Reading Input from the Keyboard, Performing Calculations (Operators. Type Conversions, Expressions), More about Data Output.

Lists and Tuples: Sequences, Introduction to Lists, List slicing, Finding Items in Lists with the in Operator, List Methods and Useful Built-in Functions, Copying Lists, Processing Lists, Two-Dimensional Lists, Tuples.

Strings: Basic String Operations, String Slicing, Testing, Searching, and Manipulating Strings.


Dictionaries and Sets: Dictionaries, Sets, Serializing Objects. **(Chapters-1, 2, 7, 8, 9)**


UNIT-II: Object-Oriented Programming and GUI Programming 15Hrs.

Object-Oriented Programming: Procedural and Object-Oriented Programming, Classes, Working with Instances, Techniques for Designing Classes.

Inheritance: Inheritance, Polymorphism.

GUI Programming: Graphical User Interfaces, Using the Tkinter Module, Display text with Label Widgets, Organizing Widgets with Frames, Button Widgets and Info Dialog Boxes, Getting Input with Entry Widget, Using Labels as Output Fields, Radio Buttons, Check Buttons. **(Chapters- 10, 11, 13)**


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Prescribed Book:

1. Tony Gaddis, Starting Out with Python (3e).

Reference Books:

1. Kenneth A. Lambert, Fundamentals of Python
2. Clinton W. Brownley, Foundations for Analytics with Python
3. James Payne, Beginning Python using Python 2.6 and Python 3
4. Charles Dierach, Introduction to Computer Science using Python
5. Paul Gries, Practical Programming: An Introduction to Computer Science using Python 3

COURSE OUTCOMES: By the end of the course students will be able to:

CO1: Develop programs using Lists, Tuples, Strings, Dictionaries and Sets.

CO2: Apply concepts of Object-Oriented Programming and usage of GUI Controls in programs.

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PROGRAM NAME: B.Sc.(Computer Science)
(w.e.f. 2021-22)

COURSE NAME: Libre office Spreadsheet
Skill Enhancement Course (SEC - 4)

COURSE CODE: SE425B

P.P.W:2

YEAR/SEMESTER: II/IV

NO. OF CREDITS: 2

COURSE OBJECTIVE: To enable students with the concepts of spread sheets to apply scientific formulae and charts.

COb1: To describe the various Functions in Worksheet.

COb2: To illustrate Conditional Formatting concepts.

1. To demonstrate aggregate functions, text functions, date & time functions, mathematical & trigonometric functions.
2. Create a column chart by including chart formats of labels X and Y axis, gridlines, titles and legends for the given data.

	A	B
1	Favorite Treats	Number of Votes
2	Candy	18
3	Chips	40
4	Cookies	80
5	Pizza	12

3. Create a bar chart, comparing two groups of data, add background image, by including chart formats of labels X and Y axis, gridlines, titles and legends.

Lemonade Stand	Annie's Profit	Billy's Profit
Monday	15	20
Tuesday	20	15
Wednesday	30	25
Thursday	3	10
Friday	7.5	10

4. Create a Pie Chart comparing two groups of data, chart formats including labels, titles and legends.

Enough Sleep

Yes 175

No 325

5. Create a Calendar for the year 2020-2021 in a single Spreadsheet using FILL option.

6. Create a Student Marks list table with the following format.

Bhavan's Vivekananda College Students Details											
Class: _____			Year _____			Teacher _____					
S.no	Name			Address			Marks			Total Marks	Average
	First name	Last name	Full name	H.No	City	State	1st Yr	2nd Yr	3rd Yr		
1											
2											
3											
4											

- Combine First and Last name and display in Full name column using functions.
- Display the State in upper case.
- Calculate Total and Average.

7. Create a Student Marks sheet of 10 students with 6 subjects and calculate Total, Average, Result and Grade using the following condition:

Grade (Average > 90 A+, Average < 90 && > 80 A, Average < 80 && > 70 B+, Average < 70 && > 60 B, Average < 60 && > 50 C, Less than 40 Fail).

Display all the subject marks in red colour which it is < 35.

Display the total marks in green colour where the total is more than 500.

Display the result Fail in red colour with bold.

8. Create an employee work sheet with the following columns (EID, NAME, SALARY, DEPT-NAME) Enter 10 records,

- o Display all the employees working for Sales dept.
- o Display all the employees working for accounting dept whose Salary > 50000.
- o Use pivot table and pivot chart to display the count of employees in each department.
- o Use pivot table to display the sum of salary for each department using sub-total option.

Note: Implement the above problem solution using Filters, Pivot tables, Pivot chart, sub-total option.

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9. The Overall Averages range from 44 to 85. Color each grade depending on a scale using **Conditional Formatting**.

A different color will apply to the following grades:

- 50 and below
- 51 to 60
- 61 to 70
- 71 to 80
- 81 and above

	A	B	C	D	E	F	G	H	I
1		Steven	Mary	Ann	Raymond	Mark	Paul	Eliza	Kelly
2	Maths	76	89	43	48	51	76	87	56
3	English	55	85	78	61	47	87	91	73
4	Science	65	82	39	58	52	65	57	45
5	History	45	91	56	72	49	56	78	56
6	Geography	51	84	54	64	47	64	67	67
7	Art	43	63	49	62	39	89	64	63
8	Computer Studies	63	95	45	59	41	92	89	52
9	French	35	91	65	26	28	51	92	56
10									
11	Overall Average	54.13	85.00	53.63	56.25	44.25	72.50	78.13	58.50

concepts and using GUI controls.

COURSE OUTCOMES: By the end of the course students will be able to:

CO1: Implement various Functions in work sheet.

CO2: Apply conditional Formatting concepts on data in Worksheets.

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Department of Computer Science**

PROGRAM NAME: B.Sc. (Computer Science) (w.e.f 2022-23)

COURSE NAME: Programming in Java

PAPER CODE: CS525

PPW: 4

YEAR/SEMESTER: III/V

NO. OF CREDITS: 4

COURSE OBJECTIVE: To enable students with the concepts of Java Programming and develop GUI applications.

UNIT-WISE COURSE OBJECTIVES:

COB1: To discuss the features of Java and construct class programs with methods.

COB2: To illustrate types of Inheritance, Packages and Arrays concepts.

COB3: To explore the concepts of Exception handling, Multithreading and Input/Output.

COB4: To learn the concepts of Applets, AWT and Swings.

UNIT-I:

15 hrs

Introduction: Java Essentials, JVM, Java Features, Creation and Execution of Programs, Data Types, Structure of Java Program, Type Casting, Classes, Objects, Class Declaration, Creating Objects.

Method Declaration and Invocation, Method Overloading, Constructors – Parameterized Constructors, Constructor Overloading, Cleaning-up unused Objects.

Class Variables & Method-static Keyword, this Keyword and Command-Line Arguments.

(Ch: 2.4, 2.5, 2.6, 2.7, 3.2, 3.8, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.11)

UNIT-II:

15 hrs

Inheritance: Introduction, Types of Inheritance, extends Keyword, Examples, Method Overriding, super, final Keyword, Abstract classes, Interfaces, Abstract Classes Verses Interfaces.

Packages: Creating and Using Packages, Access Protection.

Arrays: One-Dimensional Arrays, Two-Dimensional Arrays, Wrapper Classes, String Class.

(Ch: 5.1.1, 5.1.2, 5.2, 5.3, 5.4, 5.5, 6.1, 6.1.3, 6.2, 4.10, 6.3.2, 6.3.3)

UNIT-III:

15 hrs

Exception: Introduction, Types, Exception Handling Techniques-try, catch, multiple catch, User-Defined Exception.

Multithreading: Introduction, Main Thread and Creation of New Threads –By Inheriting the Thread Class, Thread Lifecycle, Thread Priority.

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Input/Output: Introduction, java.io Package, Reading and Writing Data- Reading/Writing Console User Input, Scanner Class, Reading/Writing Buffered Byte Stream Classes-Buffered Input Stream Class, Buffered Output Stream Class.
(Ch: 7.1, 7.2, 7.3, 8.1, 8.4, 8.5, 8.6, 8.7, 9.1, 9.2, 9.3.2, 9.3.4)

UNIT-IV:

15 hrs

Applets: Introduction, Example, Life Cycle, Applet Class, Common Methods Used in Displaying the Output (Graphics Class).

AWT: Introduction, Components, Containers, Button, Label, Checkbox, Radio Buttons, Text Field and Text Area.

Event Handling: Introduction, Event Delegation Model, Events Classes- Action Event, Key Event, Mouse Event, Mouse Wheel Event. Event Listeners-ActionListener, KeyListener, MouseListener, MouseWheelListener.

Swings: Introduction, Differences between Swing and AWT, JFrame, JApplet, JPanel.
(Ch: 12.1, 12.4, 12.5, 12.2, 12.6, 14.1, 14.2, 14.3, 14.4, 14.5, 14.6, 14.9, 13.1, 13.2, 13.3.1,13.5,15.1,15.1.2, 15.2, 15.3, 15.4)

PRESCRIBED BOOK:

1. **Programming in Java**, Sachin Malhotra, Saurabh Choudhary, Oxford University Press, Second edition, 2018.

REFERENCE BOOKS:

2. **Thinking in Java**, Bruce Eckel, Pearson Edition, Fourth Edition, 2008.
3. **Java: The Complete Reference**, Herbert Scheldt , Tata McGraw Hill; Eleventh edition,2020.
4. **Introduction to Java Programming**, Y. Daniel Liang, Pearson Education; Tenth edition, 2018.
5. **Java: How To Program**, Paul Deitel, Harvey Deitel, Pearson Education; Eleventh edition , 2018.
6. **Core Java Volume I –Fundamentals**,Cay S. Horstmann, Pearson Education; 11th edition, 2020.

COURSE OUTCOMES:

At the end of the course students will be able to:

- CO1:** Comprehend the features of Java and construct class programs with methods.
CO2: Apply the concepts of Inheritance, Packages and Arrays concepts .
CO3: Program the concepts of Exception handling, Multithreading and Input/Output.
CO4: Develop GUI programs using Applets, AWT and Swings.

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Department of Computer Science

PROGRAM NAME: B.Sc. (Computer Science) (w.e.f 2022-23)
COURSE NAME: Programming in Java Lab

PAPER CODE: CS525P
YEAR/SEMESTER: III/V

PPW: 4
NO. OF CREDITS: 1

COURSE OBJECTIVE: To enable students to apply Object-Oriented Concepts and develop GUI applications.

COB1: Learn to program concepts of OOPs, Arrays, Exception handling

COB2: To illustrate the concepts of Multithreading, Input/Output, Applets, AWT and Swings

Note:

- Programs of all the Concepts from Text Book including exercises must be practiced and executed.
- In the external lab examination student has to execute two programs with compilation and deployment steps are necessary.
- External Vice-Voce is compulsory.

Week 1:

1. Write a program to find whether a given number is prime or not.
2. Write a menu driven program for following:
 - a) Display a Fibonacci series
 - b) Compute Factorial of a number

Week 2:

3. Write a program to create an array of 10 integers. Accept values from the user in that Array. Input another number from the user and find out how many numbers are equal to the number passed, how many are greater and how many are less than the number passed.
4. Write java program for the following matrix operations:
 - a) Addition of two matrices
 - b) Transpose of a matrix

Week 3:

5. Write a java program that computes the area of a circle, rectangle and a Cylinder using Method overloading.
6. Write a program to demonstrate about types of constructors.

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Week 4:

7. Write a program to demonstrate about inner classes.
8. Write a program to demonstrate Method overriding.

Week 5:

9. Write a Java program for the implementation of multiple inheritance using Interface to calculate the area of a rectangle and triangle.
10. Write a program to create a package called Arithmetic that deals with arithmetic operations.

Week 6:

11. Write a program to demonstrate throws and finally keywords.
12. Write a program that reads two integer numbers for the variables a and b. If any other character except number (0-9) is entered then the error is caught by NumberFormatException object. After that ex.getMessage () prints the information about the error occurring causes.

Week 7:

13. Create a class called Fraction that can be used to represent the ratio of two integers. Include appropriate constructors and methods. If the denominator becomes zero, throw and handle an exception.

Week 8:

14. Write a program for the following string operations:
 - a. Compare two strings
 - b. concatenate two strings
 - c. Compute length of a string
15. Write a program to demonstrate StringBuffer class Methods.

Week 9:

16. Write a program to demonstrate Multithreading using Runnable Interface.
17. Write a program to demonstrate Synchronization in Multithreading.

Week 10:

18. Write a program to demonstrate FileInputStream and FileOutputStream Class.
19. Write a program to demonstrate RandomAccessFile class.

Week 11:

20. Write a java program to create a frame window in an Applet. Display your name, address and qualification in the frame window.(container class)
21. Write a java program to draw a line between two coordinates in a window. (container class)

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Week 12:

22. Write a java program to display the following graphics in an applet window.
a. Rectangles b. Circles c. Ellipses d. Arcs e. Polygons

Week 13:

23. Write a java program to demonstrate Components in Swings.
24. Write a java program to demonstrate JTable in Swings.

Week 14:

25. Assignment on AWT and Swing Components.

COURSE OUTCOMES:

At the end of the course students will be able to:

COB1: Apply OOPs Concepts, Arrays and Exception handling.

COB2: Implement Multithreading, Input/Output, Applets, AWT and Swings.

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PROGRAM NAME: B.Sc. (Computer Science) (w.e.f 2022-23)

COURSE NAME: Web Technologies

PAPER CODE: CS625

PPW: 4

YEAR/SEMESTER: III/VI

NO. OF CREDITS: 4

COURSE OBJECTIVE: This course is aimed to develop and provide a fundamental understanding of dynamic web site creation using HTML, CSS, JavaScript, XML and AJAX.

UNIT-WISE COURSE OBJECTIVES:

COB1: To analyze the structure of web page and identify elements and attributes of HTML, CSS

COB2: To illustrate JavaScript statements, operators and functions.

COB3: To demonstrate dynamic web program using JavaScript events and objects.

COB4: To implement XML, DTD, Schemas and Ajax (Asynchronous JavaScript and XML)

UNIT-I

15Hrs.

Introduction To XHTML– Introduction, First HTML, Structure of HTML, Headings, Linking, Images, special characters and horizontal rules, Lists, Tables, Frames, Forms, Internal linking, meta Elements. **CASCADING STYLE SHEETS** – Introduction, Inline Styles, Embedded Style Sheets, Conflicting Styles, Linking external sheets, Position Elements, box model and text flow, media types, building a CSS drop-down menu, user style sheets, CSS3.

Ch-4(4.1,4.3, 4.5,4.6,4.7,4.8,4.9,4.10,4.11,4.12,4.13) Ch – 5(5.1 to 5.6, 5.9 to 5.13)

UNIT-II

15Hrs.

Introduction to Java Scripting- Introduction, simple program, prompt dialog and alert boxes, memory concepts, operators. **Control statements I**-decision making, control structures, if... else statement, while, counter-controlled repetitions, Assignment Operators, Increment and Decrement Operators.

Control statements II- for Statement, Examples Using the for Statement, switch statement, do... while statement, *break* and *continue* statements, Logical Operators. **Functions** – program modules in JavaScript, programmer-defined functions, functions definition, scope rules, global functions, Recursion.

Ch-6(6.1,6.2,6.3,6.4,6.5,6.6,6.7),Ch-7(7.4,7.5,7.6,7.7,7.11,7.12),Ch-8(8.2,8.3,8.4, 8.5,8.6,8.7,8.9) Ch-9(9.2 ,9.4,9.8,9.9,9.10))

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UNIT-III

15Hrs.

Arrays- Introduction, declaring and allocating arrays, references and reference parameters, passing arrays to functions. Multidimensional arrays. **EVENTS** – registering event handling, event onloads, onmouseover, onmouseout, onfocus, onblur, onsubmit, onreset, event bubbling, more events.

JAVA SCRIPT OBJECTS – Introduction to object technology, Math Object, String Object, Date Object, Boolean and Number Object, document and window Objects, using cookies introduction.

Ch- 10(10.1,10.3,10.6,10.7,10.10) Ch-13 (13.2, 13.3,13.4,13.5,13.6, 13.7, 13.8,13.9) Ch-11(11.2,11.3,11.4,11.5,11.6,11.7,11.8,11.9)

UNIT-IV

15Hrs.

XML - Introduction, XML Basics, Structuring Data, XML Namespaces, Document Type Definitions (DTDs), W3C XML Schema Documents, XML Vocabularies introduction, Extensible Style sheet Language and XSL Transformations, Document Object Model (DOM) introduction.

Ajax-Enabled Rich Internet Applications: introduction, history of Ajax, traditional web applications Vs Ajax Applications, RIAs with Ajax, Ajax example using XMLHttpRequest, XML and DOM, creating full scale Ajax-enabled application, Dojo Toolkit introduction.

Ch-14(14.1,14.2,14.3,14.4,14.5,14.7,14.8,14.9) Ch-15(15.1, 15.2, 15.3, 15.5, 15.6, 15.7, 15.8)

PRESCRIBED BOOK:

1. **Internet & World Wide Web: HOW TO PROGRAM-** Paul Deitel, Harven Deitel, Abbey Deitel, Pearson Education; Fifth edition, 2018.

REFERENCE BOOKS:

1. **Internet & World Wide Web: HOW TO PROGRAM-** H. M. Deitel, P.J. Deitel, -Fourth Edition Pearson edition.
2. **Web Programming: Building Internet Applications,** Chris Bates ,Wiley, Third edition, 2007.

COURSE OUTCOMES:

By the end of the course, students will be able to:


CO1: Design static web pages using HTML and CSS.

CO2: Create web pages using JavaScript statements, operators and functions.

CO3: Develop dynamic web page using JavaScript (client side programming).

CO4: Implement XML, DTD, Schemas and interactive web applications using AJAX.

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PROGRAM NAME: B.Sc.(Computer Science) (w.e.f 2022-23)
COURSE NAME: Web Technologies LAB

PAPER CODE: CS625P

PPW: 2

YEAR/SEMESTER: III/VI

NO. OF CREDITS: 1

COURSE OBJECTIVE: To develop an ability to design and implement static and dynamic WebPages.

COb1: Learn to design Web Pages by using HTML tags, Cascading style sheets

COb2: Learn to develop JavaScript, XML.

Week 1:

1. Write a HTML program using basic text formatting tags, <p>,
, <pre>.
2. Write a HTML program by using text formatting tags (logical).

Week 2:

3. Write a HTML program using presentational element tags , <i>, <strike>, <sup>, <sub>, <big>, <small>, <hr>.
4. Write a HTML program using phrase element tags <blockquote>, <cite>, <abbr>, <acronym>, <kbd>, <address>.

Week 3:

5. Write a HTML program using different list types.
6. Create a HTML page that displays ingredients and instructions to prepare a recipe.

Week 4:

7. Write a HTML program using grouping elements <div> and .
8. Write a HTML Menu page for Example cafe site.

Week 5:

9. Write a HTML program using images, audios, videos.
10. Write a HTML program to create your time table.

Week 6:

11. Write a HTML program to create a form using text inputs, password inputs, multipleline text input, buttons, check boxes, radio buttons, select boxes, file select boxes.
12. Write a HTML program to create frames and links between frames.

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Week 7:

13. Write a HTML program to create different types of style sheets.
14. Write a HTML program to create CSS on links, lists, tables and generated content.

Week 8:

15. Write a HTML program to create your college web site using multi column layouts.
16. Write a HTML program to create your college web site using for mobile device.

Week 9:

17. Write a HTML program to create login form and verify username and password.
18. Write a JavaScript program to calculate area of rectangle using function.

Week 10:

19. Write a JavaScript program to wish good morning, good afternoon, good evening depending on the current time.
20. Write a JavaScript program using switch case?

Week 11:

21. Write a JavaScript program to print multiplication table of given number using loop.
22. Write a JavaScript programs using any 5 events.

Week 12:

23. Write a JavaScript program using JavaScript built in objects(document).
24. Write a JavaScript program to create registration Form with Validations.

Week 13:

25. Write a XML Program to represent Student Data using DTD.

Week 14:

26. Write a XML Program to represent Data using XML Schema Definition.


COURSE OUTCOMES:

At the end of the course students will be able to :

CO1: Acquire knowledge on Complete HTML and CSS to develop website.

CO2: able to design dynamic web page more interactive using JavaScript and XML.

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PROGRAM NAME: B.Sc. (Computer Science) (w.e.f 2022-23)
COURSE NAME: PHP with MY SQL

PAPER CODE: CS625A
YEAR/SEMESTER: III/VI

PPW: 4
NO. OF CREDITS: 3

COURSE OBJECTIVE: “To teach student how to build interactive websites and web application development using PHP and develop simple to complex web applications”.

UNIT-WISE COURSE OBJECTIVES:

- COB1:** An overview of PHP, setup a PHP web server.
- COB2:** Functions to manipulate strings, arrays and data.
- COB3:** To understand object oriented programming concepts and files.
- COB4:** To explain storage mechanism using databases using MYSQL.

UNIT – I

15 hrs

Introducing PHP – What is PHP? Why use PHP? Evolution of PHP.

Your first PHP script: Installing PHP, Other ways to run PHP, Creating your first script.

PHP Language Basics – Using variables, Understanding Data Types, Operators and Expressions, Constants.

Decisions and Loops – Making Decisions, Doing Repetitive Tasks with Looping, Mixing Decisions and Looping with HTML

Strings – Creating and Accessing Strings, Searching Strings, Replacing Text with Strings, Dealing with Upper and Lowercase, Formatting Strings.

(Book 1- Ch 1, Ch 2, Ch 3, Ch 4, Ch 5)

UNIT-II:

15hrs

Arrays – Creating Arrays, Accessing Array Elements, Looping through Arrays with for-each.

Functions: Creating Function,

Reading Data in Web pages: Setting up web pages to communicate with PHP, Handling Text Fields, Text Areas, Checkboxes, Radio Buttons, List Boxes, Password Controls, Image Maps, File Uploads and Buttons.

PHP Browser

(Book 1- Ch 6, Ch 7), (Book 2- Ch 5, Ch 5, Ch 6).

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UNIT – III

15 hrs

Object oriented programming: Creating Classes and objects, setting access to properties and methods, constructors, destructors, Inheritance, overriding and overloading methods, auto loading classes.

Advanced OOP: Static members and inheritance, Abstract classes, Interfaces, object iteration,

comparing objects, class constants, final keyword, reflection.

File Handling: fopen, feof, fgets, closing a file, fgetc, file_get_contents, reading a file into an array with file, file_exists, filesize, fread, fscanf, parse_ini_file, stat, fseek, copy, unlink, fwrite, reading and writing binary files, appending a file, file_put_contents, locking files.

(Book 2- Ch 7, Ch 8, Ch 9).

UNIT – IV

15hrs

Introducing Databases and SQL – Deciding How to Store Data, Understanding Relational Databases, Setting Up MySQL, A Quick Play with MySQL, Connecting MySQL from PHP.

Retrieving Data from MySQL with PHP: Retrieving Data with SELECT, Creating a Member Record Viewer.

Manipulating MySQL Data with PHP : Inserting, Updating, and Deleting Records, Building a Member Registration Application.

Sessions, Cookies and FTP.

(Book 1- Ch 12, Ch 13, Ch 14).Book 2- Ch 11)

PRESCRIBED BOOKS:

1. **Beginning PHP 5.3**, Matt Doyle, Wrox, 1st edition, 2009

2. **PHP: The Complete Reference Paperback**, Steven Holzner, McGraw Hill Education (India), INDIAN EDITION, 2017.

COURSE OUTCOMES:

At the end of the course students will be able to:


CO1: Get an overview of PHP and basic coding in PHP.

CO2: Understand arrays, functions, data

CO2: Understand the concepts of OOPS.

CO3: Get an idea on how to handle the database and its operations.

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PROGRAM NAME: B.Sc. (Computer Science) (w.e.f 2022-23)

COURSE NAME: PHP with MYSQL LAB

PAPER CODE: CS625AP

PPW: 1

YEAR/SEMESTER: III/VI

NO. OF CREDITS: 1

COURSE OBJECTIVE: To develop simple to complex scripts in PHP.

COB1: To implement simple scripting codes in PHP.

COB2: To execute various logics with PHP MYSQL in Localhost.

Week 1, 2:

1. Write a PHP script to display the Fibonacci sequence with HTML page.
2. Write a PHP script to create a chess board.

Week 3:

3. Write a PHP script using built-in string function like strpos(), strpos(), substr_count(), etc...
4. Write a PHP script to transform a string to uppercase, lowercase letters, make a string's first Character uppercase.

Week 4:

5. Write a PHP script to count number of elements in an array and display a range of array elements.
6. Write a PHP script using a function to display the entered string in reverse.


Week 5:

7. Write a PHP script to demonstrate inheritance.
8. Write a PHP script to demonstrate the object overloading with `_get()`, `_set()`, and `_call()`.

Week 6:

9. Write a PHP script to demonstrate the method overloading and method overriding mechanisms.
10. Write a PHP script to demonstrate the use of final classes and final methods.

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Week 7:

11. Write a PHP script to demonstrate the use of interfaces.
12. Write a PHP script using constructors and destructors.

Week 8:

13. Write a PHP application to handling HTML forms with PHP script.

Week 9:

14. Write a PHP script to create a file, write data into file and display the file's data.

Week 10:

15. Write a PHP script to check and change file permissions, copying, renaming and deleting files.

Week 11:

16. Write a PHP application for connecting to MySQL and reading data from database table.

Week 12:

17. Write a PHP application for inserting, updating, deleting records in the database table.

Week 13:

18. Develop a PHP application for student registration form.

Week 14:

19. Develop a PHP application for creating, updating, reading and deleting the Student records from MYSQL Database


COURSE OUTCOMES:

At the end of the course students will be able to:

COb1: Implement simple scripting codes in PHP.

COb2: Execute various logics in PHP with MYSQL.

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PROGRAM NAME: B.Sc. (Computer Science) (w.e.f 2022-23)
COURSE NAME: FUNDAMENTALS OF COMPUTERS (AECC)

PPW: 2

NO. OF CREDITS: 2

COURSE OBJECTIVE: To enrich student's knowledge in the field of emerging technologies which play a very major role in the mankind progress.

UNIT-WISE COURSE OBJECTIVES:

COB1: To introduce the Basics of Computers

COB2: To introduce various Number Systems available

UNIT-I:

Introduction to Computers: what is a computer, characteristics of Computers, Generations of Computers, Classifications of Computers, Basic Computer organization, Applications of Computers. Input and Output Devices: Input devices, Output devices, Softcopy devices, Hard copy devices. Computer Memory and Processors: Introduction, Memory Hierarchy, Processor, Registers, Cache memory, primary memory, secondary storage devices, magnetic tapes, floppy disks, hard disks, optical drives, USB flash drivers, Memory cards, Mass storage devices, Basic processors architecture.

UNIT-II:

Number System and Computer Codes: Binary number system, working with binary numbers, octal number system, hexadecimal number system, working with fractions, signed number representation in binary form, BCD code, other codes. Boolean algebra and logic gates: Boolean algebra, Venn diagrams, representation of Boolean functions, logic gates, logic diagrams and Boolean expressions using karnaugh map. Computer Software: Introduction to computer software, classification of computer software, system software, application software, firmware, middleware, acquiring computer software, design and implementation of correct, efficient and maintainable programs.

PRESCRIBED BOOK:

1. **Fundamentals of Computers**, Reema Thareja, Oxford University Press, Second Edition, 2019.

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REFERENCE BOOKS:

1. **Fundamentals of Computers**, V.Rajaraman and Neeharika Adabala, Prentice Hall India Learning Private Limited, 6th edition, 2014.
2. **Computer Fundamentals**, Anita Goel, Pearson Education India, First edition, 2010.


COURSE OUTCOMES:

At the end of the course students will be able to:

CO1: Understand the Basics of Computers.

CO2: Understand the Number System.

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COURSE NAME: BASIC COMPUTER SKILLS-AEC1(a)
(w.e.f 2022-23)

PPW: 2

NO. OF CREDITS: 2

COURSE OBJECTIVE: To impart a basic level understanding of working with a computer and its usage.

UNIT-WISE COURSE OBJECTIVES:

COB1: To understand the Basics of Computer.

COB2: To introduce basics of MS Office Tools

UNIT-I:

UNDERSTANDING OF COMPUTER AND WORD PROCESSING:

Knowing computer: What is Computer, Basic Applications of Computer; Components of Computer System, Central Processing Unit (CPU), VDU, Keyboard and Mouse, Other input/output Devices, Computer Memory, Concepts of Hardware and Software; Concept of Computing, Data and Information; Applications of IECT; Connecting keyboard, mouse, monitor and printer to CPU and checking power supply.

Operating Computer using GUI Based Operating System: What is an Operating System; Basics of Popular Operating Systems; The User Interface, Using Mouse; Using right Button of the Mouse and Moving Icons on the screen, Use of Common Icons, Status Bar, Using Menu and Menu-selection, Running an Application, Viewing of File, Folders and Directories, Creating and Renaming of files and folders, Opening and closing of different Windows; Using help; Creating Short cuts, Basics of O.S Setup; Common utilities.

Understanding Word Processing: Word Processing Basics; Opening and Closing of documents; Text creation and Manipulation; Formatting of text; Table handling; Spell check, language setting and thesaurus; Printing of word document.

UNIT II:

SPREAD SHEET, PRESENTATION SOFTWARE & INTRODUCTION TO INTERNET, WWW AND WEB BROWSERS:

Using Spread Sheet: Basics of Spreadsheet; Manipulation of cells; Formulas and Functions; Editing of Spread Sheet, printing of Spread Sheet.

Basics of presentation software: Creating Presentation; Preparation and Presentation of Slides; Slide Show; Taking printouts of presentation / handouts.

Introduction to Internet, WWW and Web Browsers:

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Introduction to Internet: Basic of Computer networks; LAN, WAN; Concept of Internet; Applications of Internet; connecting to internet; What is ISP; Knowing the Internet; Basics of internet connectivity related troubleshooting.

World Wide Web: Search Engines; Understanding URL; Domain name; IP Address; Using e- governance website.

Web Browsing: Software, Communications and collaboration: Basics of electronic mail; Getting an email account; Sending and receiving emails; Accessing sent emails; Using Emails; Document collaboration; Instant Messaging; Netiquettes.

PRESCRIBED BOOKS:

1. **Introduction to Computers**, Peter Norton, McGraw-Hill, Seventh Edition, 2017.
2. **Using Information Technology**, Brian K Williams, Stacey C. Sawyer, Tata McGraw-Hill, Tenth Edition, 2012.

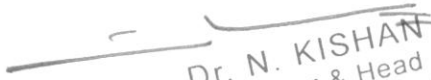
COURSE OUTCOMES:

At the end of the course students will be able to:

CO1: Understand the Basics of Computers.

CO2: Understand Basics of MS Office Tools

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COURSE NAME: Information Technologies (GE)
(w.e.f 2022-23)

PPW: 4

NO. OF CREDITS:4

COURSE OBJECTIVE: To enrich student's knowledge in the field of emerging technologies which play a major role in the mankind process.

UNIT-WISE COURSE OBJECTIVES:

COB1: To understand the basics of communications in computers

COB2: To introduce various communication techniques

COB3: To understand the major aspects in information security

COB4: To understand the risk issues and cyber laws

UNIT – I:

Computer Networks: Introduction, Connection Media, Data Transmission Mode, Data Multiplexing, Data Switching, Network Topologies, Types of Networks, Networking Devices, OSI Model. The Internet: Internet Services, Types of Internet Connections, Internet Security.

UNIT – II:

Introduction to Emerging Computer Technologies: Distributed Networking, Peer-to-peer Computing, Grid Computing, Cloud Computing, Utility Computing, On-demand Computing, Wireless Network, Bluetooth, Artificial Intelligence.

UNIT – III:

Email, Functions of Email, Browser, Web Browser, Internet Service Providers. Introduction to Information Security – Need for Information Security, Threats to Information Systems, Information Assurance, Cyber Security.

UNIT – IV:

Introduction to Application Security and Counter Measures – Introduction to Application Security, Data Security Considerations, Security Technologies, Security Threats, Security Threats to ECommerce, E-Cash and Electronic Payment System.

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PRESCRIBED BOOK:

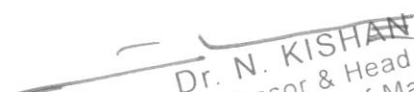
1. **Introduction to Information Security and Cyber Laws** , Dr. Surya Prakash T, Ritendra G, Praveen Kumar S, Dreamtech Publication, Simplified Chinese Edition, 2014.

COURSE OUTCOMES:

At the end of the course students will be able to:

- CO1:** Understand the basics of computer communications.
CO2: Understand the communication technologies.
CO3: Get an idea on major aspects in information security.
CO4: Understand the issues and cyber laws.

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COURSE NAME: CYBER SECURITY ESSENTIALS (GE)
(w.e.f 2022-23)

COURSE CODE: GE525B
YEAR/SEMESTER: III/V

PPW: 4
NO. OF CREDITS: 4

COURSE OBJECTIVE: To understand about Network Security Principles and types of Attacks and Defense Techniques.

COb1: To get an overview of Information Fundamentals, Firewalls.

COb2: To understand about various Security Principles applied in Microsoft Windows.

COb3: To get awareness about different Attacker Techniques.

COb4: To implement different Defense Mechanisms.

UNIT 1:

NETWORK AND SECURITY CONCEPTS:

Information Assurance Fundamentals: Authentication, Authorization, Nonrepudiation, Confidentiality, Integrity, Availability, Basic Cryptography.

The Domain Name System (DNS) -Security and the DNS.

Firewalls-History Lesson, What's in a Name?, Packet-Filtering Firewalls.

(Ch: 1, 1.1, 1.1.1, 1.1.2, 1.1.5, 1.1.6)

UNIT 2:

MICROSOFT WINDOWS SECURITY PRINCIPLES:

Windows Tokens: Introduction, Concepts behind Windows Tokens, Access Control Lists and Conclusions.

Window Messaging: Malicious Uses of Window Messages, Solving Problems with Window Messages.

Windows Program Execution: Validation of Parameters, Load Image, Make Decisions, Creating the Process Object, Context Initialization, the Windows Firewall.

(Ch: 1, 1.2, 1.2.1, 1.2.2, 1.2.3, 1.2.4)

UNIT 3:

ATTACKER TECHNIQUES AND MOTIVATIONS:

Antiforensics: How and Why Attackers Use Proxies, Types of Proxies, Detecting the Use of Proxies, Conclusion.

Tunneling Techniques: HTTP, DNS, ICMP, Detection and Prevention.

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Fraud Techniques: Phishing, Smishing, Vishing, and Mobile Malicious Code

Rogue Antivirus: Following the Money: Payments.

Click Fraud: Pay-per-Click, Click Fraud Motivations, Tactics and Detection.

(Ch: 2, 2.1, 2.1.2, 2.2, 2.2.1, 2.2.2, 2.2.3)

UNIT 4:

DEFENSE AND ANALYSIS TECHNIQUES:

Memory Forensics, Honeypots, Malicious Code Naming.

Automated Malicious Code Analysis Systems-Passive Analysis, Active Analysis, Physical or Virtual Machines.

Intrusion Detection Systems.

(Ch: 5, 5.1, 5.2, 5.3, 5.4, 5.5)

PRESCRIBED BOOK:

1. **CYBER SECURITY ESSENTIALS**, Edited by James Graham, Richard Howard Ryan Olson, CRC Press, First Edition, 2010.

COURSE OUTCOMES:

By the end of the course, students will be able to:


CO1: Get an overview of Information Fundamentals, Firewalls.

CO2: Understand about various Security Principles applied in Microsoft Windows.

CO3: Get awareness about different Attacker Techniques.

CO4: Implement different Defense Mechanisms.

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Bharatiya Vidya
Bhavan

BHAVAN'S VIVEKANANDA COLLEGE

OF SCIENCE, HUMANITIES AND COMMERCE

Sainikpuri

Autonomous College | Affiliated to Osmania University

Accredited with 'A' grade by NAAC

COURSE NAME: Python Programming(GE)

(w.e.f. 2022-2023)

COURSE CODE: GE525C

YEAR/SEMESTER: III/V

PPW: 4

NO. OF CREDITS: 4

COURSE OBJECTIVE: To familiarize the students with Python programming.

UNIT-WISE COURSE OBJECTIVES:

COB1: To demonstrate the basic concepts of Python programming.

COB2: To acquire knowledge of Control Statements and Functions.

COB3: To be able to demonstrate the concepts of Lists, Tuples, Strings, Dictionaries and Sets.

COB4: To explain the importance of Object-Oriented Programming concepts.

UNIT-I:

Introduction to Computers and Programming, Input, Processing and Output, Decision Structures and Boolean Logic

Introduction to Computers and Programming: Introduction, Hardware and Software, How Computers Store Data, How a Program Works, Using Python.

Input, Processing and Output: Designing a Program, Displaying Output with the print Function, Comments, Variables, Reading Input from the Keyboard, Performing Calculations.

Decision Structures and Boolean Logic: The if Statement, The if-else Statement, Nested Decision Structures and the if-elif-else Statement, Logical Operators, Boolean Variables.

(Ch: 1, 2, 3)

UNIT- II:

Repetition Structures and Functions

Repetition Structures: Introduction to Repetition Structures, the while Loop: A Condition-Controlled Loop, the for Loop: A Count-Controlled Loop, Nested Loops.

Functions: Introduction to Functions, Defining and Calling a Void Function, Designing a Program to Use Functions, Local Variables, Passing Arguments to Functions, Global Variables and Global Constants, Introduction to Value-Returning Functions: Generating Random Numbers.

(Ch: 4, 5)


UNIT- III:

Lists, Tuples, Strings, Dictionaries and Sets

Lists and Tuples: Sequences, Introduction to Lists, List Slicing, Finding Items in Lists with the in Operator, List Methods and Useful Built-in Functions, Copying Lists, Tuples.

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More about Strings: Basic String Operations, String Slicing.
Dictionaries and Sets: Dictionaries, Sets.
(Ch: 7, 8 and 9)

UNIT-IV:

Classes and Object-Oriented Programming, Inheritance, Recursion

Classes and Object-Oriented Programming: Procedural and Object-Oriented Programming, Classes, Working with Instances, Techniques for Designing Classes.

Inheritance: Introduction to Inheritance, Polymorphism.

Recursion: Introduction to Recursion.

(Ch: 10, 11 and 12)

PRESCRIBED BOOK:

1. **Starting Out with Python**, Tony Gaddis, Pearson Education Limited Global Edition, Third Edition, 2015.

REFERENCE BOOKS:

1. **Core Python Programming**, Dr.R.Nageswara Rao, Dreamtech Press, Second Edition, 2019.
2. **Python for Beginners**, Harsh Bhasin, New Age International (P) Ltd Publishers, 1stEdition, 2019.
3. **Learning Python**, Mark Lutz, Davis Ascher, O'Reilly Media Inc, Second Edition, 2003.
4. **The complete reference Python**, Brown Martin C, McGraw Hill Education India, Fourth Edition, 2018.

COURSE OUTCOMES: At the end of the course students will be able to

CO1: Write basic Python Programs.

CO2: Execute Python Programs using Loops and Functions.

CO3: Implement Lists, Tuples, Strings and dictionaries.

CO4: Apply the concepts of Classes, Objects, Inheritance, Polymorphism and Recursion using Python.

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