Academic Year: 2025-2026

Bharatiya Vidya Bhavan

Bhavan's Vivekananda College
of Science, Humanities and Commerce
Sainikpuri, Secunderabad-500094
(Reaccredited with 'A' Grade by NAAC)
Autonomous College – Affiliated to Osmania University

Department of Computer Science
PROGRAM NAME: B.Sc. (Computer Science)
COURSE NAME: Data Structures
(w.e.f. 2024-25)

COURSE CODE: CS325 | **YEAR/SEMESTER: II/III**
PPW: 4 | **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)

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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 book:

Data Structures Using C++, Varsha H. Patil, Oxford University Press, 1st Edition, 2012.

Reference books:

1. **Data Structures and Algorithms in C++, M.T. Goodrich, R. Tamassia, and D. Mount, John Wiley & Sons, 1st Edition, 2011.**
2. **Data Structures and Algorithms in C++, Adam Drozdek, 2nd Edition, Cengage Learning, 2001.**
3. **Introduction to Algorithms, T.H. Cormen, C.E. Leiserson, R.L. Rivest, and C. Stein, 2nd Edition, Prentice Hall of India, 2006.**
4. **Data Structures and Program Design in C++, Robert L. Kruse and A.J. Ryba, Prentice Hall, 1998.**
5. **The C++ Programming Language, Bjarne Stroustrup, 3rd Edition (Special Edition), Addison-Wesley, 2004.**
6. **Fundamental Algorithms (Vol. I), D.E. Knuth, 3rd Edition, Addison-Wesley, 1997.**

COURSE OUTCOMES:

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

CO1: Impart the 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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Academic Year: 2025-2026

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Sainikpuri, Secunderabad-500094

(Reaccredited with 'A' Grade by NAAC)

Autonomous College – Affiliated to Osmania University

Department of Computer Science

PROGRAM NAME: B.Sc. (Computer Science)

COURSE NAME: Data Structures using C++ Lab

(w.e.f. 2024-25)

COURSE CODE: CS325P **YEAR/SEMESTER: II/III**

PPW: 2 **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.

1. Write a C++ program to implement the following using an array.
   a)Stack ADT b) Queue ADT
2. Write a C++ program to convert infix expression to postfix expression and vice versa.
3. Write a C++ program to implement Circular queue using array.
4. Write a C++ program to implement the following using a single linked list.
   a)Stack ADT b) Queue ADT
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.
7. Write a C++ program to solve tower of Hanoi problem recursively.
8. Write a C++ program to perform the following operations:
   a) Insert an element into a binary search tree.
   b) Delete an element from binary search tree.
   c) Search for a key in a binary search tree.
9. Write a C++ program for the implementation of tree traversal technique BFS.
10. Write a C++ program that uses recursive functions to traverse a binary search tree.
    a) Pre-Order b) In-Order c) Post-Order
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.
13. Write a C++ program to find Inorder Successor of a given node.
14. Write a C++ programs to perform the following operations on B-Trees and AVL Trees.
    a) Insertion b) Deletion
15. Write a C++ program for sorting a given list of elements in ascending order using the following sorting methods.
    a) Quick sort b) Merge sort
16. Write a C++ program to find optimal ordering of matrix multiplication.

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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.
19. Write a C++ program to perform the following on Heap:
    a) Build Heap b)Insertion c)Deletion
20. Write a C++ programs to perform following operations on Skip List:
    a)Insertion b)Deletion
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
23. Write a C++ program to implement Heap sort using tree structure.

COURSE OUTCOMES:

At the end of the 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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Department of Computer Science
PROGRAM NAME: B.Sc. (Computer Science)
COURSE NAME: Basics of Python (SEC-1)
(w.e.f. 2024-25)

COURSE CODE: SE325A | **YEAR/SEMESTER: II/III**
PPW: 2 | **NO. OF CREDITS: 2**

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

UNIT-WISE COURSE OBJECTIVES:
CObj1: To impart knowledge on basics of Python and decision structures.
CObj2: To demonstrate functions, files and exceptions.

UNIT 1:

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)

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Prescribed Book:

Starting Out with Python, **Tony Gaddis, 3rd Edition, Pearson Education, 2020.**

Reference Books:

1. **Fundamentals of Python**, Kenneth A. Lambert, 3rd Edition, Cengage Learning, 2023.
2. **Foundations for Analytics with Python** , Clinton W. Brownley, 1st Edition, O'Reilly Media, 2016.
3. **Beginning Python: Using Python 2.6 and Python 3**, James Payne, 1st Edition, Wiley Publishing, 2010.
4. **Introduction to Computer Science Using Python**, Charles Dierbach, 1st Edition, Wiley, 2012.
5. **Practical Programming: An Introduction to Computer Science Using Python 3,** Paul Gries, Jennifer Campbell, Jason Montojo, 2nd Edition, Pragmatic Bookshelf, 2013.

COURSE OUTCOMES:

At 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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Department of Computer Science
PROGRAM NAME: B.Sc. (Computer Science)
COURSE NAME: PC Maintenance(SEC- II)
(w.e.f. 2024-25)

COURSE CODE: SE325B **YEAR/SEMESTER: II/III**
PPW: 2 **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)

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.

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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:

Upgrading and Repairing PCs, Scott Mueller, 20th Edition, QUE (PHI), 2011.

Reference Books:

1. **IBM PC Clones: Hardware, Troubleshooting and Maintenance**, Govindarajalu, 2nd Edition, McGraw-Hill Education, 2008.
2. **PC Upgrade and Repair Black Book**, Ron Gilster, 1st Edition, Paraglyph Press, 2003.

COURSE OUTCOMES:
At 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)
COURSE NAME: Database Management Systems
(w.e.f. 2024-25)

COURSE CODE: CS425 | **YEAR/SEMESTER: II/IV**
PPW: 4 | **NO. OF CREDITS: 4**

COURSE OBJECTIVE: To familiarize students with the knowledge of Databases, their design, modeling and Management.

UNIT-WISE 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 I: 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 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; 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.

(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 and 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 (Second Normal Form)- Keys and Functional Dependencies, Boyce-Codd Normal Form, 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, Time stamping 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. **Database System Concepts**, Abraham Silberschatz, Henry F. Korth, and S. Sudarshan, 6th Edition, Tata McGraw-Hill, 2017.
2. **Database Systems: A Practical Approach to Design, Implementation, and Management**, Thomas M. Connolly and Carolyn E. Begg, 6th Edition, Pearson Education, 2015.

COURSE OUTCOMES:

At the end of the course, students 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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Department of Computer Science
PROGRAM NAME: B.Sc. (Computer Science)
COURSE NAME: Database Management Systems Lab
(w.e.f. 2024-25)

COURSE CODE: CS425P **YEAR/SEMESTER: II/IV**
PPW: 2 **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

1. SQL Data types.
2. Data Definition Language, Data Manipulation Language .
3. Data Control Language.
4. Group By and Order By Clauses.
5. Set Operators.
6. Joins (Cartesian, Equi).
7. Joins (Outer, Self).
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".
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,

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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.

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.

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.

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)

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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).

13. Write a PL/SQL Program to demonstrate Procedure.
14. Write a PL/SQL program to Handle Exceptions.
15. Write a PL/SQL Program to perform a set of DML Operations.
16. Write a PL/SQL Program to demonstrate Trigger.

Course Outcomes:

At 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)
COURSE NAME: PYTHON (SEC-3)
(w.e.f. 2024-25)

COURSE CODE: SE425A **YEAR/SEMESTER: II/IV**
PPW: 2 **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)

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Prescribed Book:

1. **Starting Out with Python (3e)**, Tony Gaddis,2014.

Reference Books:

1. **Fundamentals of Python**, Kenneth A. Lambert,3rd Edition,2023.
2. **Foundations for Analytics with Python,** Clinton W. Brownley,1st Edition,2016.
3. **Beginning Python using Python 2.6 and Python3,** James Payne,1st Edition 2010.
4. **Introduction to Computer Science using Python ,** Charles Dierach 1st Edition,2012.
5. **Practical Programming: An Introduction to Computer Science using Python3,** Paul Gries 2nd Edition 2013.

COURSE OUTCOMES:

At 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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Bharatiya Vidya Bhavan

Bhavan's Vivekananda College
of Science, Humanities and Commerce
Sainikpuri, Secunderabad-500094
(Reaccredited with 'A' Grade by NAAC)
Autonomous College – Affiliated to Osmania University

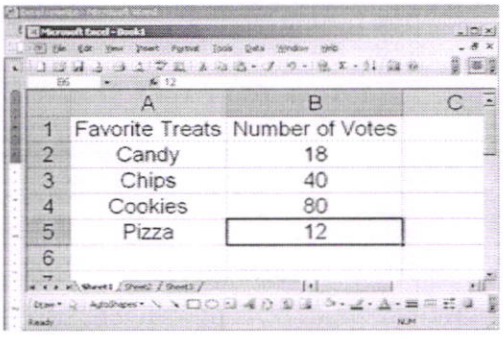
Department of Computer Science
PROGRAM NAME: B.Sc. (Computer Science)
COURSE NAME: Libre Office Spreadsheet (SEC - IV)
(w.e.f. 2024-25)

COURSE CODE: SE425B | **YEAR/SEMESTER: II/IV**
PPW:2 | **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	C
1	Favorite Treats	Number of Votes	
2	Candy	18	
3	Chips	40	
4	Cookies	80	
5	Pizza	12	
6			

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

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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

Year_____ Teacher_____

Name		Address			Marks			Total	Average
Laste name	Full name	H.No	City	State	1st Yr	2nd Yr	3rd Yr	Marks	

7. Combine First and Last name and display in Full name column using functions.

Display the State in upper case.
Calculate Total and Average.

8. 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.

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

- Display all the employees working for Sales dept.
- Display all the employees working for accounting dept whose Salary >50000.
- Use pivot table and pivot chart to display the count of employees in each department.
- 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

Use the GUI controls in your spreadsheet application to implement this formatting.

COURSE OUTCOMES:

At 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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