



| | | |
|----------------------------|-------------------------------|---------------------|
| Program | BACHELOR OF VOCATION (B.Voc.) | Semester - 3 |
| Type of Course | - | |
| Prerequisite | | |
| Rationale | - | |
| Effective From A.Y. | 2024-25 | |

| Teaching Scheme (Contact Hours) | | | | Examination Scheme | | | | |
|---------------------------------|----------|-----|--------|--------------------|-----|-----------------|-----|-------------|
| Lecture | Tutorial | Lab | Credit | Theory Marks | | Practical Marks | | Total Marks |
| | | | | SEE T | IAT | SEE P | CCE | |
| - | - | 2 | 1 | - | - | 30 | 20 | 50 |

SEE - Semester End Examination, IAT - Internal Assessment Test, CCE - Continues & Comprehensive Evaluation

| Course Content | | T - Teaching Hours W - Weightage | |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----|
| Sr. | Topics | T | W |
| 1 | To explore various Python IDEs and to demonstrate the use of data types 1. Demonstrate various Python IDEs (e.g., PyCharm, VSCode, IDLE) and their features 2. Write a program to: <ul style="list-style-type: none"> • Show different numeric data types (int, float, complex) • Perform basic arithmetic operations using these types | 2 | 5 |
| 2 | To demonstrate the use of various conditional statements Write a program to: <ol style="list-style-type: none"> 1. Check if a given letter is a vowel 2. Find the Greatest Common Divisor (GCD) of two numbers using a loop and recursion | 2 | 5 |
| 3 | To work with lists Write a program to: <ol style="list-style-type: none"> 1. Access nested members of a list 2. Find the largest number in a list 3. Remove duplicate values from a list 4. Demonstrate essential list methods - append, pop, sort, reverse | 2 | 5 |
| 4 | To demonstrate the use of tuples and its methods Write a program to: <ol style="list-style-type: none"> 1. Add an item to a tuple 2. Retrieve the nth element from the end of a tuple 3. Demonstrate necessary tuple methods - append, count, insert, pop | 2 | 5 |
| 5 | To demonstrate the use of dictionary by considering an example of contact book Write a program to maintain a contact book using a dictionary. Allow the user to: <ol style="list-style-type: none"> 1. Add, search, update, and delete contacts 2. Maintain a contact book using a dictionary | 3 | 12 |
| 6 | To explore the different methods of functions Write functions to: <ol style="list-style-type: none"> 1. Find the maximum of three numbers 2. Generate a Fibonacci sequence for a given number 3. Calculate the factorial of a number using recursion | 3 | 13 |
| 7 | To demonstrate the use of lambdas, maps, filters, and variables | 4 | 15 |



| Course Content | | T - Teaching Hours W - Weightage | |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|------------|
| Sr. | Topics | T | W |
| | <p>Write programs to:</p> <ol style="list-style-type: none"> Use lambda, map, and filter for: <ul style="list-style-type: none"> Finds all the strings given in a list that starts from "K" or "k" Multiplying values in a list by 2 Extracting subjects of a particular semester from a list of dictionaries <ul style="list-style-type: none"> i/p:- [{sem':3, 'sub':DFS}, {sem':3,'sub':DBMS}, {sem':4,'sub':python}, {sem':4, 'sub':FOS}] Expected o/p:- <ul style="list-style-type: none"> Semester: 3 Subjects: [DFS',DBMS'] | | |
| 8 | <p>To demonstrate the use of regular expressions</p> <p>Write a program to validate passwords based on the following criteria:</p> <ol style="list-style-type: none"> At least 1 letter between [a-z] At least 1 number between [0-9] At least 1 letter between [A-Z] At least 1 special character Min. length of transaction password: 6, Max. length of transaction password: 12 | 4 | 15 |
| 9 | <p>To explore the basic concepts of file handling</p> <p>Write a program to</p> <ol style="list-style-type: none"> Demonstrate file modes - r, w, a, rb Read data from a text file in reverse order and write it into another file | 2 | 5 |
| 10 | <p>To explore the use of advanced file operations</p> <p>Write a program to:</p> <ol style="list-style-type: none"> Copy the first N lines from one file to another Display the current position of the file pointer Reset the pointer to the 5th character and display the content Count the number of lines, unique words, and occurrences of each word in a text file | 3 | 10 |
| 11 | <p>To explore the basics of NumPy</p> <p>Write a program to:</p> <ol style="list-style-type: none"> Create a NumPy array Perform operations (addition, subtraction, multiplication) on the array Calculate the mean, median of the array elements | 3 | 10 |
| Total | | 30 | 100 |

| Course Outcomes | |
|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| At the end of this course, students will be able to: | |
| C01 | To write Python programs using variables, data types, flow control structures, and modules for efficient problem-solving |
| C02 | To Implement Python programs using lists, tuples, and dictionaries to store, access, and manipulate data efficiently with appropriate functions and methods |
| C03 | To write Python programs using functions, handle exceptions effectively, and perform advanced string manipulation for robust and efficient problem-solving |
| C04 | To utilize regular expressions for advanced pattern matching, perform file operations including reading, writing, and managing files, and organize file systems efficiently using Python modules |
| C05 | To apply NumPy for numerical computing by creating and manipulating arrays, performing efficient operations, and utilizing built-in functions for advanced numerical computations |

**Reference Books**

| | |
|----|--------------------------------------------------------------------------------------------------------------|
| 1. | Python: The Complete Reference By Martin C. Brown McGraw Hill Education |
| 2. | Introduction to Computation and Programming Using Python By John V Guttag Prentice Hall of India |
| 3. | Introduction to Computing and Problem Solving With Python By Jeeva Jose Khanna Publishing House |
| 4. | Taming Python by Programming By Jeeva Jose Khanna Publishing House |

Laboratory work will be based on above syllabus with minimum required experiments/exercises to be incorporated.