

**VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)
PYTHON PROGRAMMING LABORATORY**

B.Tech. I Year II Sem.

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Course Objectives:

- To install and run the Python interpreter
- To learn control structures.
- To Understand Lists, Dictionaries in python
- To Handle Strings and Files in Python

Lecture- 1: Introduction to Python, Write and Execute a simple python Program, Basic Commands, Variables, Statements, Input /Output, Keywords, Standard Data Types, Strings, Operands and operators.

Lecture-2: Understanding the Decision Control Structures: The if Statement, A Word on Indentation, The if ... else Statement, The if ... elif ... else Statement.

Lecture- 3: Loop Control Statements: The while Loop, The for Loop, Infinite Loops, Nested Loops. The break Statement, The continue Statement.

Lecture- 4: Function Definition and Execution, Scoping, Arguments, Argument Calling by Keywords, Default Arguments, Function Rules, Return Values.

Lecture- 5: Lists: List, Creating List, Updating the Elements of a List, Sorting the List Elements. Storing Different Types of Data in a List, Nested Lists, Nested Lists as Matrices.

Lecture-6: Tuples: Creating and Accessing the Tuple Elements, Basic Operations on Tuples, Functions to Nested Tuples, Inserting, Modifying and Deleting Elements from a Tuple.

Lecture- 7: Exceptions : What is an Exception?, Exception Handling: try..except..else.., try..finally.., Exceptions Nest, Raising Exceptions, Built-In Exceptions.

Lecture- 8: Files: Working with Files and Directories, File Processing, reading from files, writing to files, merging file contents, Controlling File I/O.

Lecture- 9: Python Classes and Objects. Inheritance in Python. Types of inheritance Python.

Lecture- 10: numpy, Plotpy and Scipy libraries of python and their functionalities. Basic GUI programming using these libraries: text labels and buttons.

Week -1: (Lecture- 1)

1. i) Use a web browser to go to the Python website <http://python.org>. This page contains information about Python and links to Python-related pages, and it gives you the ability to search the Python documentation.
ii) Start the Python interpreter and type help () to start the online helputility.
2. Start a Python interpreter and use it as a Calculator.
3. i) Write a program to calculate compound interest when principal, rate and number of periods is given.

- ii) Given coordinates $(x_1, y_1), (x_2, y_2)$ find the distance between two points
4. Read name, address, email and phone number of a person through keyboard and print the details.

Week - 2: (Lecture- 2 & 3)

1. Print the below triangle using for loop.

5
4 4
3 3 3
2 2 2 2
1 1 1 1 1

2. Write a program to check whether the given input is digit or lowercase character or uppercase character or a special character (use 'if-else-if' ladder)
3. Python Program to Print the Fibonacci sequence using while loop
4. Python program to print all prime numbers in a given interval (use break)

Week - 3: (Lecture- 5)

1. i) Write a program to convert a list and tuple into arrays.
ii) Write a program to find common values between two arrays.
2. Write a function called gcd that takes parameters a and b and returns their greatest common divisor.
3. Write a function called palindrome that takes a string argument and returns True if it is a palindrome and False otherwise. Remember that you can use the built-in function len to check the length of a string.

Week - 4: (Lecture- 4)

1. Write a function called is_sorted that takes a list as a parameter and returns True if the list is sorted in ascending order and False otherwise.
2. Write a function called has_duplicates that takes a list and returns True if there is any element that appears more than once. It should not modify the original list.
i). Write a function called remove_duplicates that takes a list and returns a new list with only the unique elements from the original. Hint: they don't have to be in the same order.
ii). The wordlist I provided, words.txt, doesn't contain single letter words. So you might want to add "I", "a", and the empty string.
iii). Write a python code to read dictionary values from the user. Construct a function to invert its content. i.e., keys should be values and values should be keys.
3. i) Add a comma between the characters. If the given word is 'Apple', it should become 'A,p,p,l,e'
ii) Remove the given word in all the places in a string?
iii) Write a function that takes a sentence as an input parameter and replaces the first letter of every word with the corresponding upper case letter and the rest of the letters in the word by corresponding letters in lower case without using a built-in function?
4. Writes a recursive function that generates all binary strings of n-bit length

Week - 5: (Lecture- 5)

1. i) Write a python program that defines a matrix and prints
ii) Write a python program to perform addition of two square matrices
iii) Write a python program to perform multiplication of two square matrices
2. How do you make a module? Give an example of construction of a module using different geometrical shapes and operations on them as its functions.

Week-6: (Lecture- 10)

1. a. Write a function called draw_rectangle that takes a Canvas and a Rectangle as arguments and draws a representation of the Rectangle on the Canvas.
b. Add an attribute named color to your Rectangle objects and modify draw_rectangleso that it uses the color attribute as the fill color.
c. Write a function called draw_point that takes a Canvas and a Point as arguments and draws a representation of the Point on the Canvas.
d. Define a new class called Circle with appropriate attributes and instantiate a few Circleobjects. Write a function called draw_circle that draws circles on the canvas.
2. Write a Python program to demonstrate the usage of Method Resolution Order (MRO) in multiple levels of Inheritance.
3. Write a python code to read a phone number and email-id from the user and validate it for correctness.

Week- 7: (Lecture- 7)

1. Use the structure of exception handling for all general purpose exceptions.

Week - 8: (Lecture- 8)

1. Write a Python code to merge two given file contents into a third file.
2. Write a Python code to open a given file and construct a function to check for given words present in it and display on found.
3. Write a Python code to Read text from a text file, find the word with most number of occurrences
4. Write a function that reads a file file1 and displays the number of words, number of vowels, blank spaces, lower case letters and uppercase letters.

Week - 9: (Lecture- 9)

1. Import numpy, Plotpy and Scipy and explore their functionalities.
2. a) Install NumPy package with pip and explore it.
3. Write a program to implement Digital Logic Gates – AND, OR, NOT, EX-OR.
4. Write a program to implement Half Adder, Full Adder, and ParallelAdder.
5. Write a GUI program to create a window wizard having two text labels, two text fields

and two buttons as Submit and Reset.

Course Outcomes: On successful completion of this course, students will be able to:

- CO-1: Develop the application specific codes using python.
- CO-2: Understand Strings, Lists, Tuples and Dictionaries in Python.
- CO-3: Understand the structure of exception handling for all general purpose exceptions.
- CO-4: Verify programs using modular approach, file I/O, Python standard library. Implement DigitalSystems using Python.

TEXT BOOKS:

- 1. Supercharged Python: Take your code to the next level, Overland
- 2. Learning Python, Mark Lutz, O'reilly

REFERENCE BOOKS:

- 1. Python for Data Science, Dr. Mohd. Abdul Hameed, Wiley Publications - 1st Ed. 2021.
- 2. Python Programming: A Modern Approach, Vamsi Kurama, Pearson
- 3. Python Programming A Modular Approach with Graphics, Database, Mobile, and Web Applications, Sheetal Taneja, Naveen Kumar, Pearson
- 4. Programming with Python, A User's Book, Michael Dawson, Cengage Learning, IndiaEdition
- 5. Think Python, Allen Downey, Green Tea Press
- 6. Core Python Programming, W. Chun, Pearson
- 7. Introduction to Python, Kenneth A. Lambert, Cengage