

**Course code:** CA 278  
**Course title:** Python Programming Lab.  
**Pre-requisite(s):** No  
**Co- requisite(s):** CA277 Python Programming.  
**Credits:** 2 L: 0 T: 0 P: 4  
**Class schedule per week:** 04  
**Class:** BCA  
**Semester / Level:** V/3  
**Branch:** BCA

**Name of Teacher:**

### **Course Objectives**

This course enables the students to:

1.	Understand computer programming concept using python language
2.	Explore basic data types, control structures and standard library functions.
3.	Explore the basic data structures: List, Tuple, Sets, Dictionaries available in python
4.	Learning Object oriented concept of programming and its implementation in python.
5.	Handle disk data file for input output operations.

### **Course Outcomes**

After the completion of this course, students will be able:

CO1	Solve the basic mathematical problem using python programming
CO2	Use basic data types control structures and utility functions from standard library for faster programming.
CO3	Use the basic and user defined data structures as per the need of problem.
CO4	Design and implement the problem using OOP concept of python.
CO5	Store, retrieve and manipulate data with disk file.

## **SYLLABUS**

### **List of Programs as Assignments:**

1. Write a program that displays "Hello to Python programming".

2. Write a program to read two integers and perform arithmetic operations on them (addition, subtraction, multiplication and division).
3. Write a program to read the marks of three subjects and find the average of them.
4. Surface area of a prism can be calculated if the lengths of the three sides are known. Write a program that takes the sides as input (read it as integer) and prints the surface area of the prism (Surface Area =  $2ab + 2bc + 2ca$ )
5. A plane travels 395,000 meters in 9000 seconds. Write a program to find the speed of the plane (Speed = Distance / Time).
6. You need to empty out the rectangular swimming pool which is 12 meters long, 7 meters wide and 2 meter depth. You have a pump which can move 17 cubic meters of water in an hour. Write a program to find how long it will take to empty your pool? (Volume =  $l * w * h$ , and flow = volume/time).
7. Write a program to convert temperature from centigrade (read it as float value) to Fahrenheit.
8. A car starts from a stoplight and is traveling with a velocity of 10 m/sec east in 20 seconds. Write a program to find the acceleration of the car. [ $acc = (V_{final} - V_{initial}) / \text{Time}$ ].
9. Write a Program to Prompt for a Score between 0.0 and 1.0. If the Score Is Out of Range, Print an Error. If the Score Is between 0.0 and 1.0, Print a Grade Using the Following Table

Score	Grade
$\geq 0.9$	A
$\geq 0.8$	B
$\geq 0.7$	C
$\geq 0.6$	D
$< 0.6$	F

10. Write a Program to find the maximum of three numbers.
11. Suppose you want to develop a program to play a lottery. The program randomly generates a two-digit number, prompts the user to enter a two-digit number, and determines whether the user wins according to the following rules:
  - a) If the user's input matches the lottery in the exact order, the award is \$10,000.
  - b) If all the digits in the user's input match all the digits in the lottery number, the award is \$3,000.
  - c) If one digit in the user's input matches a digit in the lottery number, the award is \$1,000.
12. Write a Program to Check If a Given Year Is a Leap Year.
13. Program to Find the GCD of Two Positive Numbers.

14. Write a program that prompts the user to enter a four-digit integer and displays the number in reverse order.
15. Write Python Program to Find the Sum of Digits in a Number
16. Write a program to print the sum of the following series.
  - a)  $1 + 1/2 + 1/3 + \dots + 1/n$
  - b)  $1/1 + 2^2/2 + 3^3/3 + \dots + n^n/n$
17. Write a Program to Display the Fibonacci Sequences up to nth Term Where n is Provided by the User.
18. Write a Program to Find the Sum of All Odd and Even Numbers up to a Number Specified by the User.
19. Write a Program to Check Whether a Number Is Prime or Not.
20. Write a Program to Find the Factorial of a Number.
21. Write a Program to Demonstrate the Return of Multiple Values from a Function Definition.
22. Program to Demonstrate the Use of Default Parameters
23. Write Program to Demonstrate the Scope of Variables.
24. Program to Print the Characters Which Are Common in Two Strings.
25. Write a program to check whether a given String is palindrome or not.
26. Write Python Program to Count the Number of Times an Item appears in the List.
27. Write a program to create a list of integer numbers. Sort the elements using any sorting method.
28. Write a program to create a lists of integer numbers and perform the linear and binary search.
29. Write a program to create a lists of cities names and perform the sort the cities name in alphabetical order.
30. Find Mean, Variance and Standard Deviation of List Numbers
31. Write a Program to Find the Transpose of a Matrix.
32. Write a program to perform the matrices multiplication.
33. Write a program to create a dictionary for countries name as key and currency as value. Traversve the dictionary with key:value Pairs in using for Loop.
34. Write a program to create tuples, and perform the following operations: Merging of tuples, Spliting of a tuple, comparison of two tuples.

35. Write a program to create an intersection, union, set difference, and symmetric difference of sets.
36. Write a program with “MyRectangle” class having the dimensions as data members and area() as a method member. Calculate the area of each rectangle object created by user.
37. Design a class with name “MyComplex” to represent the complex number including the constructor overloading, methods to perform the arithmetic operation over the two complex numbers. Write the complete python program for the above design.
38. Design a class with name “Distance” to represent the distance in feet and inch. Include the method to calculate the addition of two distances. Write the complete python program for the above design.
39. Write a complete program to implement the Employee and its subclasses (Salaried Employee, DailyWaged Employee, Commission based employee) given in Hierarchical and multilevel manner. The program should exhibit the use of super key word to invoke the super class constructor.
40. Write a program to open a file and perform the reading and writing operation with the file.
41. Write a program to count the number of line in a file.
42. Write a program to count the frequencies of each word from a file.
43. Write a program to copy the text of a file to another file.
44. Write a program to append a file with the content of another file.
45. Write a program to compare two file.
46. Write a program to delete and insert a sentence at specified position in a file.
47. Write a program to delete a sentence from a file if the file contains a specific word.
48. Write program to delete comment lines from a file.
49. Write a program to capitalize each word of the file.
50. Write a program to handle an exception using exception handling mechanism of the python.
51. Write a program to raise an exception explicitly using raise keyword.

**Text Books:**

1. Y. Daniel Liang, “Introduction to programming using python”, Pearson Education; First edition (2017).

**Reference Books :**

1. Martin C. Brown, “Python: The Complete Reference”, McGraw Hill Education; Forth edition (2018)

2. Mark Lutz, "Learning Python" O'Reilly Fifth edition (2013)
3. Mark Summerfield, "Programming in Python 3: A Complete Introduction to the Python Language" Pearson Education; Second edition (2018)

### Gaps in the Syllabus (to meet Industry/Profession requirements)

#### POs met through Gaps in the Syllabus

### Topics beyond syllabus/Advanced topics/Design

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### Course Outcome (CO) Attainment Assessment Tools & Evaluation Procedure

#### Direct Assessment

Assessment Tool	% Contribution during CO Assessment
First Quiz	10
Second Quiz	10
Viva voce	20
Day to day performance	30
Exam Evaluation performance	30

#### Indirect Assessment

1. Students' Feedback on Course Outcome.

### Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<b>CO1</b>	3	3	3	2	1	1	2	2	1	1	1	1	1	2	2
<b>CO2</b>	3	1	1	1	1	3	1	1	2	1	1	2	3	2	3
<b>CO3</b>	2	3	3	1	2	1	2	2	1	1	1	2	2	2	3
<b>CO4</b>	1	1	3	3	1	1	1	1	1	1	1	1	2	3	3
<b>CO5</b>	3	3	3	1	2	1	1	2	1	1	2	1	1	2	3

### Correlation Levels 1, 2 or 3 as defined below:

- 1: Slight (Low)    2: Moderate (Medium)    3: Substantial (High)

### Mapping Between COs and Course Delivery (CD) methods

<b>CDCode</b>	<b>Course Delivery Methods</b>	<b>Course Outcome</b>	<b>Course Delivery Method Used</b>
CD1	Lecture by use of Boards/LCD Projectors	CO1	CD1, CD8
CD2	Tutorials/Assignments	CO2	CD1, CD8 and CD9
CD3	Seminars	CO3	CD1, CD2 and CD5
CD4	Mini Projects/Projects	CO4	CD1, CD5, CD8and CD9
CD5	Laboratory Experiments/Teaching Aids	CO5	CD1, CD2 and CD9
CD6	Industrial/Guest Lectures		
CD7	Industrial Visits/In-plant Training		
CD8	Self- learning such as use of NPTEL Materials and Internets		
CD9	Simulation		