RAGHU ENGINEERING COLLEGE

AUTONOMOUS

(Approved by AICTE, New Delhi, Accredited by NBA (CIV,ECE,MECH,CSE), NAAC with 'A+' grade & Permanently Affiliated to JNTU-GV, Vizianagaram)

Dakamarri, Bheemunipatnam Mandal, Visakhapatnam Dist. – 531 162 (A.P.)

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(2342501) Python Programming							
(Common to CSE, CSM, CSD, CSC, CSO,EEE)							
Programme &Branch	**B.Tech – CSE**	**Sem**	**Category**	**L**	**T**	**P**	**C**
Prerequisites	**Basic mathematics**	**3**	Skill Enhancement course	**0**	**1**	**2**	**2**
Preamble	**The main objectives of the course is to make student**						

Course Objectives:

The main objectives of the course is to

- Learn about Python programming language syntax, semantics, basics and the runtime environment
- Be familiarized with general computer programming concepts like conditional execution, loops & functions
- Be familiarized with data structures, object-oriented programming and exception handling in Python

List of Experiments :

1	**Exercise 1- Basics (Variables, Assignment)** a) Correct the below code and execute it: val=789 print("Given value is: ",VAL) print("Python is a case sensitive language") [Variables] b) Correct the below code, add the code if needed to display the output as given: Code snippet: $name='My name" @age=40 Desired output: Name: My name Age: 40 [Variables] c) Write a program to assign same value to multiple variables in a single line of statement. [Variables]
2	**Exercise 2- Input Output** a) Write a program to read Regd. No, name from the student and display it on the screen. [input() function] b) Write a program to display the value of PI (3.1416) adjusted to two decimal points. [input() function] c) Write a program to display the below message: Hello, \nREI\n studennts [Escape Character]
3	**Exercise 3- Operators**

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	a) Write a program that asks the user for a weight in kilograms and converts it to pounds. There are 2.2 pounds in a kilogram [Arithmetic Operator] b) Write a program that asks the user to enter three numbers (use three separate input statements). Create variables called total and average that hold the sum and average of the three numbers and print out the values of total and average [Arithmetic Operator] c) Write a program to find power of a number without using loops and built-in functions. Base and exponent value to be taken from the user [Arithmetic Operator]
4	**Exercise 4- Conditional Statements** a) Write a program to display 'Valid' if the value is odd and lesser than 10000, otherwise 'Invalid'. [if-else] b) Write a program that asks the user to enter a length in feet. The program should then give the user the option to convert from feet into inches, yards, miles, millimeters, centimeters, meters, or kilometers. Say if the user enters a 1, then the program converts to inches, if they enter a 2, then the program converts to yards, etc. [elif] c) Write a program to check whether given character is alphabet or not, if yes check whether vowel or consonant. [nested-if]
5	**Exercise 5- Looping Statements** a) Write a program to print the following pattern when n (no. of rows) is given as input, If n=4, * * * * * * * * * * [loops] b) Write a program to display first repeating character from the beginning of the given string. [loops] c) Write a program to print next immediate prime number of the given number. [loops]
6	**Exercise 6- Branching Statements** a) Write a program to display numbers between 1 to n. But, one of the numbers between 1 and n is unsafe and that number shouldn't be displayed. Assume, unsafe number is a number which is divisible by 3. [continue] b) Write a program to input some numbers repeatedly and print their sum. The program ends when the users say no more to enter i.e. normal termination or program aborts when the number entered is less than 0. [break] c) Write a program which takes a string from the user and display each character in single line, while iterating skip the printing if the character is 't'.

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	[continue]
7	**Exercise 7- Lists** a) Write a program to compute cumulative product of a list of numbers [list] b) Write a program to find the sum of corner elements in the given matrix [list] c) Write a program that asks the user for an integer and creates a list that consists of the factors of that integer. [list]
8	**Exercise 8- Tuples** a) Given a list of numbers, write a Python program to create a list of tuples having first element as the number and second element as the cube of the number. [tuple] b) Write a program to extract only extreme K elements, i.e maximum and minimum K elements in Tuple. Input : test_tup = (3, 7, 1, 18, 9), k = 2 Output : 3, 1, 9, 18 [tuple] c) Write a program to produce a tuple of elements which consists of multiplication of each element and its adjacent element in the original tuple. [tuple]
9	**Exercise 9- Sets** a) Write a program to demonstrate the below functions of Set, i) add() ii) update() iii) discard() [set] b) Write a program to demonstrate the below functions of Set, i) pop() ii) union() iii) intersection() [set] c) Write a program to demonstrate the below functions of Set, i) difference ii) isdisjoint() iii) symmetric_difference() [set]
10	**Exercise 10- Dictionaries** a) Write a program to count the numbers of characters in the string and store them in a dictionary data structure. Sample Input: hello python Sample Output: 1, e : 1, h : 2, l : 2, n : 1, o : 2, p : 1, t : 1, y : 1 [dictionary] b) Write a program to use split and join methods in the string and trace a birthday with a Dictionary data structure. If birthday is not found, display a message 'Not found'. Sample Input: 25/08/1991 XYZ 12/02/1990 ABC 01/01/1989 PQR 25-08-1991 Sample Output: The DOB 25/08/1991 found whose name is XYZ [dictionary] c) Write a program that combines two given lists into a dictionary Sample Input jkl def abc ghi 10 20 30 40 Sample Output abc:30 def:20 ghi:40 jkl:10 [dictionary]
11	**Exercise 11- Strings** a) Write a program to find the reverse of each word in the given list of strings and display

	them. [strings] b) Given a string, the task is to write a program to extract overlapping consecutive string slices from the original string according to size K. K and string is to be given by user. [strings] c) Given a string, the task is to write a program to replace every Nth character in a string by the given value K. String, K and N must be given the user. [strings]
12	**Exercise 12- Functions** a) Write a function called 'sum_digits' that is given an integer num and returns the sum of the digits of num. [functions] b) Write a function called 'first_diff' that is given two strings and returns the first location in which the strings differ. If the strings are identical, it should return -1. [functions] c) Write a function 'ball_collide' that takes two balls as parameters and computes if they are colliding. Your function should return a Boolean representing whether or not the balls are colliding. [functions] Hint: Represent a ball on a plane as a tuple of (x, y, r), r being the radius. If (distance between two balls centers) <= (sum of their radii) then (they are colliding)
13	**Exercise 13- Modules** a) Write a program to work with below functions in math module i) cos() ii) ceil() iii) sqrt b) Write a program to work with below functions in os module i) name ii) getcwd() iii) listdir() – Display only first 10 elements c) Write a program to work with below functions in statistics module i) mean() ii) median() iii) mode()
	Total: 30hrs

References/Manuals/Software :

1	**Text Books:** 1) Fundamentals of Python First Programs, Kenneth. A. Lambert, Cengage. 2) Python Programming: A Modern Approach, Vamsi Kurama, Pearson 3) Learning Python, Mark Lutz, Orielly
2	**Laboratory Manual**
3	**Virtual Labs link** 1) https://docs.python.org/3/

Preamble	**After completion of the course, students will be able to**	
COURSE OUTCOMES: On completion of the course , the student will be able to		**BT Mapped** (Highest Level)
CO 1	Write, Test and Debug Python Programs	**Understand**

CO 2	Solve coding tasks related conditional execution, loops	**Apply**
CO 3	Use functions and represent compound data using Lists, Tuples and Dictionaries etc.	**Apply**

Mapping of COs with POs and PSOs

COs/POs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	1	2	2	3	1	-	-	-	-	-	-	1	2	1	-
CO 2	1	2	2	3	1	-	-	-	-	-	-	1	2	1	-
CO 3	1	2	2	3	1	-	-	-	-	-	-	1	2	1	-
1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy															