/Program : **Diploma in Electronics/ Electronics and Communication Engineering**	
Course Code: **4049**	Course Title: **Python Programming Lab**
Semester: **4**	Credits: **No Credit**
Course Category: **Program Core**	
Periods per week: **3 (L:0, T:1, P:2)**	Periods per semester:**45**

Course Objectives:

- To provide fundamental concepts of open source Python programming language.
- To introduce emerging areas of Python Programming.

Course Prerequisites:

Topic	Courseco de	Course name	Semester
Basic Engineering Mathematics principles		Mathematics-I Mathematics-II	1 & 2
Basic Programming concepts		Programming in C Lab	3

Course Outcomes:

COn	Description	Duration (Hours)	Cognitive level
CO1	Develop Python programs using standard I/O functions and basic operators**.**	9	Applying
CO2	Develop Python programs using control flow and looping statements	12	Applying
CO3	Construct Python programs using user defined functions	12	Applying
CO4	Develop Python programs using file I/O handling functions	9	Applying
	Lab Exam	3	

CO – PO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3						
CO2	3						
CO3	3						3
CO4	3		3	3			

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline:

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO1	**Develop Python programs using standard I/O functions and basic operators.**		
M1.01	Install Python environment in Windows Linux and Android, use of IDLE and Python path setting	1P	Applying
M1.02	Demonstrate input and output functions	1T+1P	Understanding
M1.03	Demonstrate standard data types in Python	1T	Understanding
M1.04	Develop simple programs using basic operators.(Arithmetic operators, Comparison operators, Assignment operators, Logical operators, Bitwise operators, Membership operators)	2T+3P	Applying
CO2	**Develop Python programs using control flow and looping statements**		
M2.01	Build programs using flow control or decision making statements - IF statement, IF … ELIF…ELSE and nested IF statements. **Suggested Experiments:** 1.Check whether the given two numbers are equal 2.Check whether the given number is odd or even 3.Find largest among the given three numbers 4.Character name of the day	3T+3P	Applying

M2.02	Build programs using loop statements - for, while and nested loop. **Suggested Experiments:** 1. Display the first n natural numbers 2. Read 10 numbers from keyboard and find their sum and average 3. Display the cube of the numbers upto the given integer 4. Display the multiplication table of a given integer. 5. Sum of the elements in a matrix.	3T+3P	Applying
	Lab Exam - I	1.5	
CO3	**Construct Python programs using user defined functions**		
M3.01	Develop simple programs to demonstrate how to define and call user defined functions	2T+1P	Understanding
M3.02	Develop programs using user defined functions with/withoutarguments(Keyword arguments & Parameter with Default Value) and with/without return value **Suggested Experiments:** 1.Python function to check whether the given number is even or odd 2.Find the sum and average of two integer numbers using user defined functions (default arguments) 3.Print multiplication table of the given number using user defined function	3T+6P	Applying
CO4	**Develop Python programs using file I/O handling functions**		
M4.01	Implement File I/O handling functions – open(), close(), read(), write(), tell() and seek()	3T+3P	Applying
	Open Ended Experiments	3	Applying
	Lab Exam – II	**1.5**	

**** - Suggested Open Ended Projects**

(Not for End Semester Examination but compulsory to be included in Continuous Internal Evaluation. Students can do open ended experiments as a group of 2-3. There is no duplication in experiments between groups. This experiment shall be included in the bona-fide record.

Example:

- Develop applications such as Make a simple calculator, feet to meters conversion tool etc.

Text / Reference:

T/R	Book Title/Author
T1	M. T. Savaliya , R. K. Maurya, "Programming through Python", StarEdu Solutions.
R1	Charles Severance, "*Python for Everybody",* Kindle Edition
R2	Kenneth A. Lambert, "*Fundamentals of Python*", Cengage
R3	Allen Downey, Jeff Elkner and Chris Meyers,*"Learning with Python",*Green Tea Press
R4	Wesley J Chun , "*Core Python Programming"*,2nd ed.,Prentice Hall
R5	Dr. R. Nageswara Rao, "*Core Python Programming"*, 2nd ed., Kindle Edition

Online Resources:

Sl. No	Website Link
1	https://www.javatpoint.com/python-programs
2	https://www.geeksforgeeks.org/python-programming-examples/
3	https://www.programiz.com/python-programming
4	https://www.tutorialspoint.com/python/index.htm
5	https://wiki.python.org/moin/SimplePrograms
6	https://codescracker.com/python/program/

Sample Questions to Test Outcomes

1. Calculate area of basic shapes
2. Generate Fibonacci series
3. Sum of natural numbers
4. Check whether the given number is prime or not
5. Display the contents of a file.