Devi Ahilya University, Indore, India Institute of Engineering & Technology				III Year B.E. (Electronics and Instrumentation Engg.)			
Subject Code & Name	**Instructions Hours per Week**			**Credits**			
5EIRC2	**L**	**T**	**P**	**L**	**T**	**P**	**Total**
PYTHON PROGRAMMING AND APPLICATIONS	**3**	**1**	**1**	**3**	**1**	**1**	**5**
Duration of Theory Paper: 3 Hours							

Course Objective:

The course is designed

1. To read and write simple Python programs.
2. To develop Python programs with conditionals and loops.
3. To define Python functions and call them.
4. To use Python data structures –- lists, tuples, dictionaries.
5. To do input/output with files in Python.

Prerequisite: Fundamental knowledge about computer systems, Basic knowledge of C Programming.

COURSE CONTENTS

Unit I

Introduction, Data Types and Operators: Installation and working with Python, Variables and data types in python, perform computations and create logical statements using Python's operators: Arithmetic, Assignment, Comparison, Logical, Membership, Identity, Bitwise operators, list, tuple and string operation

Unit II

Python Decision making and Loops: Write conditional statements using If statement, if ...else statement, elseif statement and Boolean expressions, While loop, For loop, Nested Loop, Infinite loop, Break statement, Continue statement, Pass statement, Use for and while loops along with useful built-in functions to iterate over and manipulate lists, sets, and dictionaries. Plotting data, Programs using decision making and loops.

Unit III

Defining custom functions, Organizing Python codes using functions, Create and reference variables using the appropriate scope, Basic skills for working with lists, tuples, work with dates and times, get started with dictionaries, importing own module as well as external modules, Programming using functions, modules and external packages.

Unit IV

Python File Operations: An introduction to file I/O, use text files, use CSV files, use binary files, Handle a single exception, handle multiple exceptions, Illustrative programs, Exercises.

Unit V

Python applications: Introducing Python programming to different fields as data analysis, machine learning, Artificial intelligence, image processing, IOT etc.

Course Outcome:

Students earned credits will develop ability to

CO.No.	CO	PO
CO1	Read, write, and execute by hand simple Python programs.	PO-1
CO2	Structure simple Python programs for solving problems..	PO-1, PO-2
CO3	Decompose a Python program into functions.	PO-2, PO-3, PO-4
CO4	Represent compound data using Python lists, tuples, and dictionaries.	PO-3, PO-4
CO5	Read and write data from/to files in Python Programs	PO-3, PO-4, PO-5

CO-PO Relationship

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
CO1	2											
CO2	2	3										
CO3		3	3	3								
CO4			3									
CO5			3	3	3							

TEXT BOOKS

1. Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist ‘‘, 2nd edition, Updated for Python 3, Shroff/O‘Reilly Publishers, 2016.
2. R. Nageswara Rao, “Core Python Programming”, dreamtech 3. Python Programming: A Modern Approach, Vamsi Kurama, Pearson

REFERENCE BOOKS:

1. Core Python Programming, W.Chun, Pearson.
2. Introduction to Python, Kenneth A. Lambert, Cengage
3. Learning Python, Mark Lutz, Orielly

List of Practical Assignments:

[1] Write Python programs to understand control structures
[2] Write Python programs to understand list and tuples
[3] Use conditional statements and loops in Python programs
[4] Write python programs to create functions and use functions in the program
[5] Import module and use it in Python programs
[6] Write python program to plot data using PyPlot
[7] Write python program for IOT application
[8] Write python program for sensor application
[9] write python program for data science application.