Devi Ahilya Vishwavidhyalaya, Indore, India **Institute of Engineering & Technology**					**II Year B.Tech. (Computer Science and Engineering)**	
Course Code & Name	**Instructions Hours per Semester and Credits**					
3RCPC5 **PYTHON PROGRAMMING**	**Classroom Instruction (CI)**		**Lab Instruction (LI)**	**Term Work (TW) and Self Learning (SL)**	**Total no. of Hours Per semester**	**Total Credits (Total Hours/30)**
	L	**T**	**P**	**TW+SL**	**60**	**2**
	0	**0**	**40**	**20**		

Course Learning Objectives:

- The course aims to understand the features of basic and object-oriented programming in python.
- To develop python programs using basic and advanced constructs that will solve real life problems.
- Apply the advance python concepts for making python programs and projects.

Prerequisites: Basic knowledge of computer parts, algorithms, flowcharts, operators.

COURSE CONTENTS

Unit 1: Basic Introduction
Introduction to Python, History, Features, Python Installation on Windows, Command interpreter and development environment-IDLE, Python 2 & 3, Python Syntax, Python Indentation, keywords, operators, variables, datatypes, type casting, comments.

Unit 2:Data Structures, Input-Output and Control Flow
Basic program using input-output statement. Python String:- slicing, split (), modify strings, string formatting, concatenation. Control Flow Statements:- if-else, if-elif-else, nested if statement, match-case statement. Iterative Statements: for loop, while loop, nested loops. Transfer Statements:-break, continue and pass statement. Python list, tuple, list vs tuple, dictionary.

Unit 3: Functions, Modules and OOPs Concepts
Functions: - Definition and use, Arguments, Keyword and Arbitrary Keyword Arguments, Recursion, Lambda function, Inbuilt functions. Modules: - User-defined module, Build-in modules: -Datetime, Math, RegEx, Random, Python PIP. OOPs Concepts: - Classes & Objects, Encapsulation, Inheritance, Polymorphism, Constructor & Destructor, Python Scopes.

Unit 4: Exception Handling, File Handing and Database Connections
Exception Handling: - try- except, try- except-else-finally block, assertions. File Handing: - Create files, Opening and Closing a file with various modes, deleting a file. Database Connections: - Python MySQL database connectivity, create database & table, insert data into table, extract data from table.

Unit 5: Advance Python Library
Numpy: ndarray manipulations, mathematical functions. Pandas: - Data Preprocessing, Data Cleaning, Data Visualization, Web Scraping, Introduction to web development basic (Flask/Django).

Course Outcome (CO):

CO. No.	CO
CO1	Understand the fundamental concepts of Python programming such and learn its syntax and semantics
CO2	To learn how to use lists, tuples, dictionaries, indexing and slicing to access data in Python programs.
CO3	To learn how to design modular programs and do object-oriented program with Python classes.
CO4	To learn to read and write files and do exceptional handling in Python.
CO5	To learn how to do database connections and use advance python library in Python projects.

Books Recommended:

[1]. Dr. P. Arockia Mary, Problem Solving and Python Programming, Shanlax Publications, 2021.
[2]. Pratiyush Guleria, Basics of Python Programming, BPB Publication, March 2020.
[3]. Allen B. Downey, Think Python: How to Think Like a Computer Scientist, 2nd edition, Updated for Python 3, Shroff/O'Reilly Publication,2016.
[4]. Dr. R. Nageswara Rao, Core Python Programming, 2nd edition, dreamtech publication, 2018.
[5]. Vamsi Kurama, Python Programming: A Modern Approach, Pearson Publication, 2018.

CO-PO-PSO Relationship:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO-1	PSO-2	PSO-3
3RCPC5.CO1	3	3	3	3	3							3	2	1
3RCPC5.CO2	3	3	3	3	3							3	3	2
3RCPC5.CO3	3	3	3	3	3							3	3	2
3RCPC5.CO4	3	3	3	3	3							3	2	1
3RCPC5.CO5	3	3	3	3	3							3	2	3

List of Experiments:

1. Program to Print Hello world!
2. Program to Find the Largest Among Three Numbers.
3. Program to Find the Square Root.
4. Program to Find the Sum of Digits of a Number.
5. Program to Sort an array in Ascending Order.
6. Program to Find the longest word in a sentence.
7. Program to Search for an Element in an Array (Linear Search).
8. Program to Store Student Records using Dictionary.
9. Program to Pass List or Tuple to Function.
10. Program to Display Odd Numbers from 1 to 10 using range ().
11. Program to Display Sum of a List of Numbers using loop.
12. Program to Define Student Class and create an Object to it. Also, we will call the method and Display the Students' Details.
13. Program to Implement a Simple Class for Bank Account.
14. Program to Implement Multiple Inheritance using Two Base Classes.
15. Program to Implement Constructor and Destructor.
16. Program to Show method overloading to Find Sum of Two or Three Numbers.

17. Program to Connect MySQL database in Python.
18. Program to Handle Exception in Python.
19. Program to Read and Write Data to a File.
20. Program to Copy the Contents of a File to another File.