

**SEMESTER-IV**  
**COURSE 9: PYTHON PROGRAMMING**

Theory

Credits: 3

3 hrs/week

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**Unit-I**

**Getting Started with Python:** Introduction to Python , Python Keywords , Identifiers , Variables , Comments, Data Types , Operators, Input and Output , Type Conversion , Debugging . Flow of Control, Selection , Indentation , Repetition , Break and Continue Statement , Nested Loops .

**Strings-** String Operations , Traversing a String , String handling Functions.

**Case Study:**

1. Study the features that make Python different from Procedural Languages.

**Unit-II**

**Functions:** Functions, Built-in Functions, User Defined Functions, recursive functions, Scope of a Variable

**Python and OOP:** Defining Classes, Defining and calling functions passing arguments, Inheritance, polymorphism, Modules – date time, math, Packages.

**Exception Handling-** Exception in python, Types of Exception, User-defined Exceptions.

**Case Study:**

1. Present a report of how Exception handling is different from JAVA Exceptional Handling.

**Unit-III**

**List:** Introduction to List, List Operations, Traversing a List, List Methods and Built-in Functions.

**Tuples and Dictionaries,** Introduction to Tuples, Tuple Operations, Tuple Methods and Built-in Functions, Nested Tuples. Introduction to Dictionaries, Dictionaries are Mutable, Dictionary Operations, Traversing a Dictionary, Dictionary Methods and Built-in functions.

**Case Study:**

1. What are the special features of dictionaries and try to analyze about the same features in any other language.

**Unit-IV**

**Introduction to NumPy,** Array , NumPy Array , Indexing and Slicing , Operations on Arrays , Concatenating Arrays , Reshaping Arrays , Splitting Arrays , Statistical Operations on Arrays.

**Data Handling using Pandas ,** Introduction to Python Libraries, Series, DataFrame, Importing and Exporting Data between CSV Files and DataFrames, Pandas Series Vs NumPy ndarray.

**Case Study:**

1. Present a paper on advanced features of NumPy and Pandas.

## **Unit-V**

**Plotting Data using Matplotlib:** Introduction, Plotting using Matplotlib –Line chart, Bar chart, Histogram, Scatter Chart, Pie Chart.

**GUI Programming and Database Connectivity** Using Python. Graphical User Interfaces. Using the Tkinter Module, Creating Label, Text, Buttons, info Dialog Boxes, Radiobutton, Checkbutton, Getting Input, Importing MySQL for Python , Connecting with a database, Forming a query in MySQL, Passing a query to MySQL.

### **Case Study:**

1. Present a paper on the features and advantages of MySQL compared to other commercial Databases.

### **References:**

1. Mark Lutz, Learning Python,5th Ed. O'REILLY
2. Core Python Programming by Dr. R. Nageswara Rao
3. Problem Solving and Python Programming by E. Balaguru Swamy
4. Python programming: using problem solving approach by Reema Thareja.
5. Albert Lukaszewski ,MySQL for Python,Packet Publishing

**SEMESTER-IV**  
**COURSE 9: PYTHON PROGRAMMING**

Practical

Credits: 1

2 hrs/week

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**Lab Programs**

1. Write a Program to check whether given number is Armstrong or not.
2. Write a Program to check whether given number is perfect or not.
3. Write a program to find factorial of given number using recursive function
4. Write a program to implement inheritance and polymorphism
5. Demonstrate a python code to print try, except and finally block statements
6. Write a program to demonstrate String handling functions
7. Write a program to input n numbers from the user. Store these numbers in a tuple. Print the maximum and minimum number from this tuple.
8. Write a program to enter names of employees and their salaries as input and store them in a dictionary
9. Write a program to implement statistical operations on arrays using numPy
10. Write a program to import and export CSV file to DataFrame.
11. Create the DataFrame Sales containing year wise sales and perform basic operation on it.
12. Visualize the plots using matplotlib lib.
13. Create GUI interface with different types button and labels
14. Create GUI interface and connect with MySQL database and perform CRUD(Create, Read, Update and Delete) operations.