CERTIFICATE COURSE IN PYTHON PROGRAMMING

(6 Months)

STATE BOARD OF TECHNICAL EDUCATION AND TRAINING

SANKETHIKA VIDYA BHAVAN, MASAB TANK, TELANGANA:HYDERABAD

Certificate Course in PYTHON Programming

Duration of the Course : 6 Months

Eligibility : Intermediate or its equivalent

Total Teaching Hrs : 250 Hrs

Scheme of Instruction and Examination

Sub Code	Subject Name	Instruction Period/Week		Total Periods	Scheme of Examination			
		Theory	Practical		Duration	Internal Marks	End Exam Marks	Total Marks
THEORY								
PP-101	Basic Python Programming	03	-	50	3Hrs	0	100	100
PP-102	Advanced Python Programming	03	-	50	3Hrs	0	100	100
PRACTICALS								
PP-103	Basic Python Programming Lab	-	04	75	3Hrs	40	60	100
PP-104	Advanced Python Programming Lab	-	04	75	3Hrs	40	60	100
	TOTAL	06	08	250		80	320	400

Certificate Course in Python Programming

Subject Code	**:**	PP - 101
Subject Name	:	Basic Python Programming
Periods/Week	:	03 Hrs
Total Periods	:	50 Hrs

About Course

This Course covers both basics of Python, such as writing Python scripts, sequence and file operations, object-oriented concepts, and Data Management.

Course Objectives: This course enables the students to

- Learn Syntax and Semantics and create Functions in Python.
- Handle Strings and Files in Python.
- Understand Lists, Dictionaries and Regular expressions in Python.
- Implement Object Oriented Programming concepts in Python.

Course Outcomes: On completion of this course the students are able to

- Write Python scripts and test code
- Programmatically download and analyze data
- Implement the techniques to deal with different types of data – ordinal, categorical, encoding
- Create data visualization
- Use Python notebooks and master the art of presenting step-by-step data analysis

UNIT-1: Introduction to Python (10 Hrs)

Need for Programming, Advantages of Programming, Overview of Python, Organizations using Python, Python Applications in Various Domains, Python Installation, Variables, Operands and Expressions, Conditional Statements, Looping Statements, Command Line Arguments.

UNIT -2: Sequential File Operations (10 Hrs)

Python File Input / Output Functions, Lists and its Operations, Tuples and its Operations, Strings and its Operations, Sets and its Operations, Dictionaries and its Operations, Read and write CSV Files, Read and write Excel Files.

UNIT -3: Functions (8 Hrs)

User-Defined Functions, Various Function Parameters, Built-in-Functions, Lambda functions, Global Keyword, Global Variables.

UNIT -4: Object Oriented Programming (12 Hrs)

Introduction to OOPS, Private, Public and Protected Attributes and Methods, Class Variables and Instance Variables, Constructor and Destructor, Inheritance and its types, Overloading, Overriding, Getter and Setter Methods.

UNIT -5: Data Manipulation (4 Hrs)

Read CSV File, Write CSV File, Read Excel File, Write Excel File.

UNIT -6: Python Regular Expressions (6 Hrs)

Python Regular Expressions, Working with Date and Time, Basic Functionalities of a data object, Merging of Data objects, Concatenation of data objects, Types of Joins on data objects, Exploring a Dataset, Analyzing a dataset.

Certificate Course in Python Programming

Subject Code	**:**	PP - 102
Subject Name	:	Advanced Python Programming
Periods/Week	:	03 Hrs
Total Periods	:	50 Hrs

About Course

This Course covers advanced concepts of Python, such as Exception handling, modules, database programming, and GUI application. During this journey, you will learn many essential and widely used Python libraries such as pandas, NumPy, Matplotlib, among others.

Course Objectives: This course enables the students to

- Learn Syntax and Semantics and create Functions in Python.
- Handle Strings and Files in Python.
- Understand Lists, Dictionaries and Regular expressions in Python.
- Implement Object Oriented Programming concepts in Python.
- Build Web Services and introduction to Network and Database Programming in Python.

Course Outcomes: On completion of this course the students are able to

- Write Python scripts and test code
- Programmatically download and analyze data
- Implement the techniques to deal with different types of data – ordinal, categorical, encoding
- Create data visualization
- Use Python notebooks and master the art of presenting step-by-step data analysis

UNIT-1: Working with Exceptions (7 Hrs)

Exceptions in Python, Detecting and Handling Exceptions, Context Management, Exceptions as Strings, Raising Exceptions, Assertions.

UNIT -2: Working with Modules (8 Hrs)

Modules and Files, Namespaces, Importing Modules, Importing Module Attributes Module Built-in Functions, Packages, and Other Features of Modules.

UNIT -3: Introduction to Numpy (8 Hrs)

Introduction to Numpy, Operations on Arrays, Indexing, Slicing and Iterating, Numpy Array Attributes, Numpy Functions, Array Manipulation, File Handling using NumPy.

UNIT -4: Database Programming (8 Hrs)

Introduction, Python Database Application Programmer's Interface (DB-API), Object Relational Managers (ORMs), Related Modules.

UNIT -5: GUI Programming (9 Hrs)

Introduction, TKinter and Python Programming, Brief Tour of Other GUIs, Related Modules and Other GUIs, TKinter Button, TKinter Canvas, TKinter Check button, TKinter Frame, TKinter Label, TKinter Radio button, TKinter Text, TKinter Listbox, TKinter Menu, TKinter Menu button, TKinter Message Box, TKinter Scrollbar.

UNIT -6: Case Study (10 Hrs)

Bank Application, eLearning Application.

Certificate Course in Python Programming

Subject Code	**:**	PP - 103
Subject Name	:	Basic Python Programming Lab
Periods/Week	:	04 Hrs
Total Periods	:	75 Hrs

Objectives: This Practical Lab will enable students to

- Learn Syntax and Semantics and create Functions in Python.
- Handle Strings and Files in Python.
- Understand Lists, Dictionaries and Regular expressions in Python.
- Implement Object Oriented Programming concepts in Python.

List of Experiments

1. **a)** Write a program add.py that takes 2 numbers as command line arguments and prints its sum.
   b) Write a Program for checking whether the given number is an even number or not.
2. **a)** Using a for loop, write a program that prints out the decimal equivalents of 1/2, 1/3, 1/4. . . 1/10
   b) Find the sum of all the primes below given no.
3. Write a program to count frequency of characters in a given file. Can you use character Frequency to tell whether the given file is a Python program file, C program file or a text File?
4. **a)** A python program to display and sum of a list of numbers using while loop
   b) A python program to create a text file to store individual characters.
   c) A python program to read all the strings from the text file and display them.
   d) A Python program to know whether a file exists or not.
5. **a)** A Python program to randomly access a record from a binary file
   b) A Python program to update or modify a record in a binary file.
6. **a)** Write a program to compute the number of characters, words and lines in a file.
   b) Write a Python Program to perform Linear Search
   c) Write a Python Program to perform Binary Search

Certificate Course in Python Programming

Subject Code	**:**	PP - 104
Subject Name	:	Advanced Python Programming Lab
Periods/Week	:	04 Hrs
Total Periods	:	75 Hrs

Objectives: This Practical Lab will enable students to

- Learn File handling in Python.
- Implement Exception Handling in Python.
- Create Database, tables and Manipulation.
- Build GUI Applications and Database Programming in Python.

List of Experiments

1. a) Write a python program to handle IO Error produced by open ( ) function.
   b) Write a python program to handle multiple exceptions.
   c) A python program to create our own exception and raise it when needed.
2. a) A Python program to store the messages released by any exception into a log file.
   b) Write a simple script that serves a simple HTTP Response and a simple HTML Page
3. a) Describe about Instance variable using ATM Machine Class
   b) Write a GUI for an Expression Calculator using tk
4. Create a database name "Python_DB". Create Hospital and Doctor tables with the following fields
   Hospital (Hospital_ID, Hospital_Name, Bed_Count)
   Doctor (Doctor_Id, Doctor_Name, Hospital_ID, Joining_Date, Specialty, Salary, Experience)
5. Write the following queries on the above Created Tables.
   Query1. Fetch Hospital and Doctor Information using hospital Id and doctor Id
   Query2. Get the list of doctors as per the given specialty and salary
   Query3. Get a list of doctors from a given hospital
   Query4. Update doctor experience in years
6. Create Registration and Login Form using TKinter.