Information Booklet cum Syllabus

Of

Basic Python Course

Revision-I

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National Institute of Electronics and Information Technology

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Sl. No.	Title	Page No.
1.	About the course	2
2.	NIELIT	2
3.	Objective of Course	2
4.	Job Role of Course	3
5.	Eligibility	3
6.	Duration of Course	3
7.	Practical/ Tutorial	3
8.	Course Details	3-5
9.	Reference Books / Study Material	5
10.	Practical Assignments	6-8
11.	Sample Questions	8-9

<div align="center">CONTENTS</div>

1.   **About Course**

This course is designed to provide acquire the Knowledge of Python Programming, after the course students will be able to: Build basic programs using fundamental programming constructs like variables, conditional logic, looping, functions Lambda Function, Sequence Data type, File handling, Module, OOPs Concept and Exception Handling. Work with user input to create fun and interactive programs.

2.   **NIELIT**

National Institute of Electronics and Information Technology, NIELIT, (Erstwhile DOEACC Society) is an autonomous scientific society of the Ministry of Electronics & Information Technology, Government of India. The Society is registered under the Societies Registration Act, 1860. NIELIT was set up to carry out Human Resource Development and related activities in the area of Information, Electronics & Communications Technology (IECT). NIELIT is engaged both in Formal & Non-Formal Education in the areas of IECT besides development of industry oriented quality education and training programmes in the state-of-the-art areas. NIELIT has endeavored to establish standards to be the country's premier institution for Examination and Certification in the field of IECT. It is also one of the National Examination Body, which accredits institutes/organizations for conducting courses in IT and Electronics in the non-formal sector.

3.   **Objective of Course**

Python is the fastest growing programming language globally, mainly due to its simplicity and large community. Python is easy to use, powerful and versatile programming language, making it a great choice for programmer/developer. This course introduces programming and the Python language. Students are introduced to core programming concepts and the course content theory and practical both so that students understand concept and code to implement the program in a organized way. Also various tools available for writing and running Python programs with coding examples and assignments..

After completing the module, the learner will be able to:

- Understand the python Language and describe its features.
- Understand the concept of Python Program and make program by using Control Structure.
- Able to understand the User Defined Function and create the UDF.
- Able to understand Sequence Data Type (List, Tuple, Set and Dictionary).
- Understand the concept of Module/ Package in python.
- Understand the concept of OOPs and also their implementation.
- Understand the File Handling in Python.
- And able to handle Exception in program.

4. Job Roles of Course

After successful completion of the qualification the candidates shall be employed in the industries for following occupations:

- Assistant Programmer
- Training/Faculty
- And also make Career in Machine Learning/AI

5. Eligibility

12th Pass, Basic Knowledge of Computer.

6. Total duration of the Course

40 Hours (Theory: 16 Hrs, Practical/Tutorial: 24 Hrs)

7. Course Details

7.1. Course Outline and Objective of Each Unit

S. No.	Unit Name	Duration (Theory) in Hours	Duration (Practical) in Hours	Total Learning Hrs.	Learning Objectives
1	Introduction to Python Programming	4	6	10	After completion of this unit of module, Learner will be able to • Understand Basic of Python Programming Compare it's with other programming language understand Data type. • Installation of Python. • Able to make Program by using conditional Statement and accepting user input.
2	Loop,Nested Loop,Conept of Sequence Data Types(List,Tuples,Set and Dictionary)	4	6	10	After completing this unit, Learner will be able to understand • Understand the concept of Loop , Nested Loop and able to make program based on loop & nested

					loop • Know very well what Sequence Data type is and how to use it. • Able to make program by using Sequence Data type
3	String, Function/ Anonymouse Function ,Module and File Handling	4	6	10	After completing this unit, Learner will be able to understand • String in Python. • User Defined Function and Lambda Function • Able to create module/Package. • Able to read/write data from a text file.
4	OOPs Concept and Exception Handling	4	6	10	After completing this unit, Learner will be able to understand • Concept OOPs. • Understanding Class and object. • Features of OOPs like Inheritance, Constructor/Destructor and polymorphism. • Understanding types of Error and Handling runtime error.

7.2.Detailed Syllabus

Unit Name	Contents	Hrs.
Introduction to Python Programming	• Introduction, Applications, Diff. b/w C and Python. • Python Virtual Machine (PVM), Installation, Execution of program • Operators, Data types, Literals, Constants, Identifiers, Naming Conventions with examples	10

	• Managing Input and Output with examples • Concept of Indentation and if, if...else, if…elif…else statement with examples	
Loop,Nested Loop,Conept of Sequence Data Types(List,Tuples,Set and Dictionary)	• While loop, for loop, range () function, break and continue, pass & return statements. • Nesting of loops • Concept of Array and its operations, Handling Strings and Characters. • List, Tuples • Sets, Dictionary	10

String, Function/ Anonymouse Function ,Module and File Handling	• String Handling in Python. • Concept of Functions with Examples • Anonymous functions (Lambda Function), Recursive Functions. • Introduction to File Handling, File Operations, Directories • Built-in Modules, Import statement, Packages, Date and Time Modules	10
OOPs Concept and Exception Handling	• Object Oriented Programming Concepts • Classes and Objects, Encapsulation Constructor, Destructor and Inheritance • Data Hiding, Method Overriding, Polymorphism • Handling Exceptions: try…except, try…finally.	10

8.   Reference Books/Study Material

- Python Programming Python Programming for Beginners By By Adam Stewart
- Python Cookbook By David Beazley and Brian K. Jones
- Introduction to Python Programming By Gowrishankar S. Veena A.

9. Practical Assignments

Assignment 1.
Installation of Python IDLE Environment

- Write a program to print "Hello, This is My First Python Program".

- Python Program to read two numbers and print their quotient and remainder.

- Python Program to take the temperature in Celsius and convert it to Fahrenheit.

- Python Program to read height in centimeters and then convert the height to feet and inches

- Python program to add two numbers.

- Python Program to print odd numbers within a given range.

- Python Program for Program to find area of a circle.

- Python Program for Simple interest calculation.

- Python program to reverse three digits number without using loop.

- Python program to exchange the values of two numbers without using a temporary variable.

- Python program to calculate gross salary where gross salary=Basic+HRA+DA
    - In this HRA is 16% of Basic, DA is 12% of Basic

Assignment 2.
- Write a Python program to find maximum between two numbers using if else.

- Write a program to find maximum among three number

- Python Program to Take in the Marks of 5 Subjects and Display the Grade.

- Python Program to check Armstrong Number use three digit number.

- Write a Python program to check whether a number is positive, negative or zero.

Assignment 3.
- Python program to calculate factorial of a given number

- Python Program to find the sum of digits in a number.

- Python Program to count the number of digits in a number.

- Python Program for n-th Fibonacci number.

Assignment 4.
- Create a function to calculate the area of Circle.

- Create a function to find out factorial of a number.

- Create a function to find the reverse of a number.

- Create a function to calculate the arithmetic operation.

Assignment 5.
- Program to Find Out Length of String.

- Python program to Check Palindrome of string.

- Program to count No. of vowels of string.

- By using String Function Count a substring in main string

Assignment 6.
- Create a lambda Function to calculate remainder.

- Find the Square of a number by using lambda function.

- Program to add number from 1 to 6 by using Function recursion.

- Program to Calculate Factorial Value By Using Recursion Function.

Assignment 7.
- Program to check the file is Exist or not.

- Program to Read text from File. (File Must be created before reading) at default location.

- Write a program to save the output of program in a file.

- Create a file By using w mode.

- Create a Program to Writing in file using writelines function.

Assignment 8.
- Create a module to calculate Simple Interest and use this module in another Program by Using import method.
- Create a package and import this package in another Program.

Assignment 9.
- Create a Program to calculate sum of two numbers by Using OOPs Concept.
- Create a constructor to take input as a Function.
- Create a class that derived from base class by using derived class object access the base class method.
- Create a Program to Explain Overriding method.

Assignment 10.
- Create a Program to Handle Exception
- Create a program to make your own exception class.
- Create a Program to explain try, except and finally method.

Sample Questions:

1. Python was created by _____.
   a. James Gosling   b. Bill Gates
   c. Steve Jobs   d. Guido van Rossum

2. Which of the following is an invalid variable?
   a. my_string_1   b. 1st_string
   c. foo   d. _

3. The && and || operators
   a. Compare two numeric values   b. Combine two numeric values
   c. Compare two Boolean values   d. Combine two Boolean values

4. What will be the output of the following Python code?
   ```
   True = False
   while True:
       print(True)
       break
   ```
   a. True   b. False
   c. None   d. Yes

5. Suppose list1 is [2, 33, 222, 14, 25], What is list1[:-1]?
   a. [2,33,222,14]   b. Error
   c. 25   d. [25,14,222,33,2]

6. What is a variable defined inside a function referred to as?
   a. A static variable   b. A global variable
   c. A local variable   d. An automatic variable

7. random() function will give values between
   a. 1 to 10   b. 1 to -1
   c. 1 to 20   d. 0 to 1

8. Which function is used to close a file in python?
   a. close()   b. stop()
   c. end()   d. close file()

9. _____ represents an entity in the real world with its identity and behaviour.
   a. A method   b. An object
   c. A class   d. An operator

10. To determine in which order Python should access namespace, you can use the:
    a. LEGB rule   b. LGBE rule
    c. LBGE rule   d. LGEB rule