NBC Universal   Introduction to Python - Outline   3/5/2025

<u>Duration:</u> 3 - days

<u>Course Content</u>

1. Python Development Environment

• Selecting, installing, and using an editor for writing Python code.

• Understanding the Python interpreter and execution model (replacing compiler-based concepts).

• Managing files and configuring system settings to support Python programming.

2. Writing and Running Python Code

• Writing, saving, and executing Python scripts.

• Declaring variables and assigning values.

• Performing mathematical operations and storing results in variables.

• Understanding string concatenation and working with text data.

• Producing console output with labeled variable values.

• Writing a simple Python program from scratch to solve a given problem.

3. User Input and Program Flow Control

• Accepting console input from users.

• Prompting users for input and handling responses.

• Interrupting or terminating a running program.

4. Mathematical Operations and Code Organization

• Using built-in Python math functions.

• Understanding integer division and floating-point rounding.

• Organizing code using indentation-based code blocks.

5. Conditional Logic and Loops

• Implementing if statements for conditional execution.

• Using if-else logic for branching decisions.

• Combining conditions using and AND or operators.

• Implementing validation loops to ensure correct input.

• Using while loops and control statements (break, continue).

6. Advanced Flow Control

• Using elif statements for multi-branch decisions.

• Understanding and implementing event-controlled vs. count-controlled loops.

• Implementing for loops for iteration.

• Managing nested loops and understanding loop control.

• Applying DeMorgan's Theorem to simplify logic conditions.

7. Functions and Data Handling

• Writing and using functions with and without return values.

• Utilizing parameters to pass data into functions.

• Understanding Boolean values and their use in control flow.

• Exploring numerical precision and how floating-point numbers are handled in Python.

• Understanding text storage in memory and string manipulation.

8. File Handling in Python

• Opening, reading, and writing to text files.

• Handling end-of-file conditions in loops.

• Appending data to existing files.

9. Working with Lists and Collections

• Using Python lists

• Finding minimum, maximum, and average values in a list.

• Sorting lists using built-in and custom sorting methods

10. Object-Oriented Programming in Python

• Defining and instantiating objects.

• Creating and managing lists of objects.

• Passing objects and lists of objects to functions.

11. Advanced Data Structures

• Exploring Python collections (set, tuple, dict).

• Introduction to recursion and its applications in Python.