

TRAINING CONTENTS

Session	Name of the Topics	Contact Hour
Session 01	Introduction to Programming: <ul style="list-style-type: none">● Overview of the course● Introduction to programming and programming languages● Evolution and different generations of programming languages● Applications of Python programming Practical: Running the first “hello world” program	3
Session 02	Different Ways of Running Python: <ul style="list-style-type: none">● Program running environments, Python interpreter● Various ways of running Python codes (scripts, terminal, notebooks, etc.) Practical: Downloading and installing Python and IDEs, Running Python in online IDEs	3
Session 3	Variables and Expressions: <ul style="list-style-type: none">● Variable name and declaration● Python Keywords● Operator, Operand, and Operation● Different types of operation: arithmetic, logical● Operator precedence Practical: Working with Python variables, keywords. Different types of operations with different variables.	3
Session 4	Program Control Flow: <ul style="list-style-type: none">● Program flow● Control Handling● Boolean expression● Logical operations and operators● Conditional and alternative execution	3

	<ul style="list-style-type: none"> ● Chained and nested conditional <p>Practical: Python flow-control and conditional execution.</p>	
Session 5	<p>Function:</p> <ul style="list-style-type: none"> ● Function calling and declaration ● Different types of functions, user-defined and built-in functions ● Parameters and arguments ● Function return values, a fruitful and a void function <p>Practical: Using different types of built-in Python functions and implementing user-defined functions.</p>	3
Session 6	<p>Iteration (Looping):</p> <ul style="list-style-type: none"> ● Different types of Loop ● For loop statement ● While loop statement ● range() function ● Loop control statements: break, continue <p>Practical: Implementing for and while loops with control statements</p>	3
Session 7	<p>String Handling in Python:</p> <ul style="list-style-type: none"> ● String data structure ● Different operations with string: slicing, adding, removing elements ● Different string built-in methods ● Different types of applications of string <p>Practical: Working with strings. Processing text data with string operations.</p>	3

<p>Session 8</p>	<p>List in Python:</p> <ul style="list-style-type: none"> ● List data structure ● Different operations with List: slicing; concatenation; adding, deleting elements ● Different built-in methods of List ● Different types of applications of list <p>Practical: Creating a list with different types of data. Operations with different list methods.</p>	<p>3</p>
<p>Session 9</p>	<p>Introduction to Algorithms:</p> <ul style="list-style-type: none"> ● Order of growth ● Algorithm notations ● Writing algorithm ● Searching algorithm: Binary search, Bisection method ● Sorting algorithm: Bubble sort, Insertion sort, Merge sort ● Complexity analysis of different algorithms <p>Practical: Implementing different searching and sorting algorithms in Python and their complexity analysis</p>	<p>3</p>
<p>Session 10</p>	<p>Dictionaries:</p> <ul style="list-style-type: none"> ● Dictionary declaration ● Dictionary as a collection of counters ● Looping and dictionaries ● Reverse lookup ● Dictionaries and lists ● Global variable <p>Practical: Write programs to manipulate dictionaries</p>	<p>3</p>
<p>Session 11</p>	<p>Tuples and Sets:</p> <ul style="list-style-type: none"> ● Tuple creation and manipulation ● Immutable nature of tuple ● Tuple assignment ● Tuples and Return Values ● Variable-length argument tuples ● Lists and tuples 	<p>3</p>

	<ul style="list-style-type: none"> ● Dictionaries and tuples ● Set creation and manipulation ● Adding and removing elements ● Set operations (union, intersection, difference) <p>Practical: Writing programs to manipulate tuples and sets with different operations on tuples and sets.</p>	
Session 12	<p>File Handling in Python:</p> <ul style="list-style-type: none"> ● Reading and writing files ● Opening and closing files ● Filenames and paths ● With a statement for file handling <p>Practical: Real-world file handling and manipulation.</p>	3
Session 13	<p>Error and Exception Handling:</p> <ul style="list-style-type: none"> ● Try, except, else, and finally blocks ● Introduction to exceptions ● Different built-in exceptions ● Creating custom exceptions <p>Practical: Write programs with error and exception handling; Implement custom exceptions</p>	3
Session 14	<p>Modules and Packages:</p> <ul style="list-style-type: none"> ● Introduction to modules and packages ● Importing modules: Built-in modules (math, random, datetime) ● Standard Library modules ● Creating and using packages: Organizing code into modules and packages <p>Practical: Implementing and using different modules and packages</p>	3

Session 15	<p>Object-Oriented Programming (OOP):</p> <ul style="list-style-type: none"> ● Basic concept of OOP ● Classes and objects ● Attributes and methods ● Different special methods (dunder methods) i.e. init() ● Constructor functions <p>Practical: Implementing classes and objects with different attributes and methods.</p>	3
Session 16	<p>OOP: Inheritance and Polymorphism:</p> <ul style="list-style-type: none"> ● Inheritance ● Single and multiple inheritance ● Polymorphism ● Overloading <p>Practical: Implementing inheritance in programs. Using polymorphism in practical applications</p>	3
Session 17	<p>OOP: Encapsulation and Abstraction:</p> <ul style="list-style-type: none"> ● Introduction to encapsulation ● Private and protected members ● Real-world applications of OOP <p>Practical: Implementing private and protected members with real-world application</p>	3
Session 18	<p>Working with Libraries:</p> <ul style="list-style-type: none"> ● Different use cases of Python libraries ● NumPy for numerical operations ● Basic uses of NumPy arrays ● Pandas for data manipulation ● Virtual environment management <p>Practical: Writing programs using NumPy and pandas for basic data manipulation (e.g., array operations with NumPy, data frame operations with pandas)</p>	3

Session 19	<p>Network Programs using Python:</p> <ul style="list-style-type: none"> ● HTTP ● urllib ● Web scraping ● BeautifulSoup ● Requests <p>Practical: Implementing a simple web scraper for scraping headlines from a news website, extracting data from a webpage</p>	3
Session 20	<p>Mentorship Session:</p> <p>A dedicated session with an industry expert to discuss career opportunities, real-world applications of Python programming, and insights into the latest trends.</p>	3
	Total Class Hours	60 hours