

TRAINING CONTENTS

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

Session 8	<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>	3
Session 9	<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>	3
Session 10	<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>	3
Session 11	<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 	3

	<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