**PYTHON**

**1. Python Basics**

* What is Python
* Why Python?
* History of python
* Applications of Python
* Features of Python
* Advantages of Python
* Versions of Python
* Installation of Python
* Flavors of Python
* Comparision b/w various programming languages C, Java and Python

**2. Python Operations**

* Python Modes of Execution
* Interactive mode of Execution
* Batch mode of Execution
* Python Editors and IDEs
* Python Data Types
* Python Constants
* Python Variables
* Comments in python
* Output Print(),function
* Input() Function :Accepting input
* Type Conversion
* Type(),Id() Functions
* Comments in Python
* Escape Sequences in Python
* Strings in Python
* String indices and slicing

**3. Operators in Python**

* Arithmetic Operators
* Comparision Operators
* Logical Operators
* Assignment Operators
* Short Hand Assignment Operators
* Bitwise Operators
* Membership Operators
* Identity Operators

**4. Python IDE’s**

* Pycharm IDE Installation
* Working with Pycharm
* Pycharm components
* Installing Anaconda
* What is Conda?
* Anaconda Prompt
* Anaconda Navigator
* Jupyter Notebook
* Jupyter Features
* Spyder IDE
* Spyder Featueres
* Conda and PIP

**5. Flow Control statements**

* Block/clause
* Indentation in Python
* **Conditional Statements**
  + if stmt
  + if…else statement
  + if…elif…statement

**6. Looping Statements**

* while loop,
* while … else,
* for loop
* Range() in for loop
* Nested for loop
* Break statememt
* Continue statement
* Pass statement

**7. Strings in Python**

* Creating Strings
* String indexing
* String slicing
* String Concatenation
* String Comparision
* String splitting and joining
* Finding Sub Strings
* String Case Change
* Split strings
* String methods

**8. Collections in Python**

* Introduction
* Lists
* Tuples
* Sets
* Dictionaries
* Operations on collections
* Functions for collections
* Methods of collection
* Nested collections
* Differences b/w list tuple and set and Dictionary

**9. Python Lists**

* List properties
* List Creation
* List indexing and slicing
* List Operations
* List addresses
* List functions
* Different ways of creating lists
* Nested Lists
* List modification
* List insertion and deletion
* List Methods

**10. Python Tuples**

* Tuple properties
* Tuple Creation
* Tuple indexing and slicing
* Different ways of creating tuples
* Tuple Operations
* Tuple Addresses
* Tuple Functions
* Nested Tuples
* Tuple Methods
* Differences b/w List and Tuple

**11. Python Sets**

* Set properties
* Set Creation
* Set Operations
* Set Functions
* Set Addresses
* Set Mathematical Operations
* Set Methods
* Insertion and Deletion operation

**12. Python Dictionary**

* Dictionary properties
* Dictionary Creation
* Dictionary Operations
* Dictionary Addresses
* Nested Dictionaries
* Dictionary Methods
* Insertion and Deletion of elements
* Differences b/w list tuple and set and Dictionary

**13. Functions in Python**

* Defining a function
* Calling a function
* Properties of Function
* Examples of Functions
* Categories of Functions
* Argument types
  + default arguments
  + non-default arguments
  + keyword arguments
  + non keyword arguments
* Variable Length Arguments
* Variables scope
* Call by value and Call by Reference
* Passing collections to function
* Local and Global variables
* Recursive Function
* Boolean Function
* Passing functions to function
* Anonymous or Lamda function
* Filter() and map() functions
* Reduce Function

**14. Modules in Python**

* What is a module?
* Different types of module
* Creating user defined module
* Setting path
* The import statement
* Normal Import
* From … Import
* Module Aliases
* Reloading a module
* Dir function
* Working with Standard modules -Math, Random, Date time and os modules,

**15. Packages**

* Introduction to packages
* Defining packages
* Importing from packages
* --init--.py file
* Defining sub packages
* Importing from sub packages

**16. Errors and Exception Handling**

* Types of errors
* Compile-Time Errors
* Run-Time Errors
* What is Exception?
* Need of Exception handling
* Predefined Exceptions
* Try,Except, finally blocks
* Nested blocks
* Handling Multiple Exceptions
* User defined Exceptions
* Raise statement

**17. File Handling**

* Introduction
* Types of Files in Python
* Opening a file
* Closing a file
* Writing data to files
* Tell( ) and seek( ) methods
* Reading a data from files
* Appending data to files
* With open stmt
* Various functions

**18. OOPs Concepts**

* OOPS Features
* Encapsulation
* Abstraction
* Class
* Object
* Static and non static variables
* Defining methods
* Diff b/w functions & methods
* Constructors
* Parameterized Constructors
* Built –in attributes
* Object Reference count
* Destructor
* Garbage Collection
* Inheritance
* Types of Inheritances
* Object class
* Polymorphism
* Over riding
* Super() statement

**19. Regular Expressions**

* What is regular expression?
* Special characters
* Forming regular expression
* Compiling regular expressions
* Grouping
* Findall() function
* Finditer() function
* Sub() function
* Match() function
* Search() function
* Matching vs searching
* Splitting a string
* Replacing text
* validations

**20. Database Access**

* Introduction
* Installing mysql database
* Creating database users,
* Installing Oracle Python modules
* Establishing connection with mysql
* Closing database connections
* Connection object
* Cursor object
* Executing SQL queries
* Retrieving data from Database.
* Using bind variables executing
* SQL queries
* Transaction Management
* Handling errors

**21. Python Date and Time**

* How to Use Date &DateTime Class
* Time and date Objects
* Calendar in Python
* The Time Module
* Python Calendar Module

**22. Operating System Module**

* Introduction
* getcwd
* listdir
* chdir
* mkdir
* rename file/dir
* remove file/dir
* rmtree()
* Os help
* Os operations

**23. Advanced concepts**

* Python Iterator
* Python Generator
* Python closure
* Python Decorators
* Web Scraping
* PIP
* Working with CSV files
* Working with XML files
* Working with JSON files
* Debugging

**24. GUI Programming (tkinter)**

* Introduction
* Components and events
* Root window
* Labels
* Fonts and colors
* Buttons, checkbox
* Label widget
* Message widget
* Text widget
* Radio button
* image

**25. Excel Workbook**

* Installing and working with Xlsx writer
* Creating Excel Work book
* Inserting into excel sheet
* Insetting data into multiple excel sheets
* Creating headers
* Installing and working with xlrd module
* Reading a specific cell or row or column
* Reading specific rows and columns

**26. Data Analytics**

* Introduction
* pandas module
* Numpy module
* Matplotlib module
* Working Examples

**27. Introduction to Datascience**

* Machine Learning Introduction
* Datasets
* Supervised /Unsupervised Learning
* Statistical Analysis
* Data Analysis
* Uni-variate/multi-variate analysis
* Corelation Analysis
* Algorithm types
* Applications

**28. Python Pandas**

* Introduction to Pandas
* Creating Pandas Series
* Creating Data Frames
* Pandas Data Frames from dictionaries
* Pandas Data Frames from list
* Pandas Data Frames from series
* Pandas Data Frames from CSV, Excel
* Pandas Data Frames from JSON
* Pandas Data Frames from Databases
* Pandas Data Functionality
* Pandas Timedelta
* Creating Data Frames from Timedelta
* Pandas Groupings and Aggregations
* Converting Data Frames from list
* Creating Functions
* Converting Different Formats
* Pandas and Matplotlib
* Pandas usecases

**29. Python Numpy**

* Introduction to Numpy
* Numpy Arrays
* Numpy Array Indexing
* 2-D and 3Dimensional Arrays
* Numpy Mathematical operations
* Numpy Flattening and reshaping
* Numpy Horizontal and Vertical Stack
* Numpy linespace and arrange
* Numpy asarray and Random numbers
* Numpy iterations and Transpose
* Numpy Array Manipulation
* Numpy and matplotlib
* Numpy Linear Algebra
* Numpy String Functions
* Numpy operations and usecases
* Numpy Working Examples

**30. Python Matplotlib**

* Introduction to matplotlib
* Installing matplotlib
* Generating graphs
* Normal plottings
* Generating Bargraphs
* Histograms
* Scatter plots
* Stack plots
* Pie plots
* Matplotlib working examples