

Advance Python Programming

Course Content

1. **Python refresher**

- a. Data types
- b. Sequences
- c. Mapping types
- d. Program structure
- e. Files and console, I/O
- f. Conditionals
- g. Loops
- h. Built-ins

2. **OS Services**

- a. The OS module
- b. Environment variables
- c. Launching external commands
- d. Walking directory trees
- e. Paths, directories, and filenames
- f. Working with file systems
- g. Dates and times

3. **Pythonic Programming**

- a. The Zen of Python
- b. Common idioms
- c. Lambda functions
- d. List comprehensions
- e. Generator expressions
- f. String formatting

4. **Modules and packages**

- a. Initialization code
- b. Namespaces
- c. Executing modules as scripts
- d. Documentation
- e. Packages and name resolution
- f. Naming conventions
- g. Using imports

5. **Classes**

- a. Defining classes
- b. Instance methods and data
- c. Properties
- d. Initializers
- e. Class and static methods/data
- f. Inheritance

6. **Metaprogramming**

- a. Implicit properties
- b. `globals()` and `locals()`

- c. Working with attributes
- d. The inspect module
- e. Decorators
- f. Monkey patching

7. **Programmer tools**

- a. Analyzing programs
- b. Using pylint
- c. Testing code
- d. Using unittest
- e. Debugging
- f. Profiling and benchmarking

8. **Database access**

- a. The DB API
- b. Available Interfaces
- c. Connecting to a server
- d. Creating and executing a cursor
- e. Fetching data
- f. Parameterized statements
- g. Metadata
- h. Transaction control
- i. Other DBMS modules

9. **Network Programming**

- a. Sockets
- b. Clients
- c. Servers
- d. Application protocols
- e. Forking servers
- f. Binary data

10. **Multiprogramming**

- a. When to use threads?
- b. The Global Interpreter Lock
- c. The threading module
- d. Simple threading
- e. Sharing variables
- f. The queue module
- g. Debugging threaded programs
- h. Multiprocessing
- i. Other alternatives

11. **XML and JSON**

- a. Working with XML
- b. DOM and Sax
- c. Introducing ElementTree and xml
- d. Parsing XML
- e. Navigating the document
- f. Creating a new XML document
- g. JSON
- h. Parsing JSON into Python
- i. Converting Python into JSON

12. **Extending Python**

- a. About non-Python modules
- b. Overview of a C extension
- c. Writing C by hand
- d. Using SWIG
- e. Loading modules with ctypes