

# Advanced Python Programming

## Detailed Course Outline

### Target Audience

This course targets medium level **Python programmers** who would like to dive deeper into the language. Alternatively, participants can attend our course “Python Programming” to be able to take full advantage of this advanced course.

**Duration : 60 hrs**

**Fees : Rs 12,000/-**

### 1. Functional Programming

- 1.1. Lambdas
- 1.2. List Comprehensions
- 1.3. Set and Dictionary Comprehensions
- 1.4. Closures and Decorators
- 1.5. Generators and Coroutines
- 1.6. Generator Expressions
- 1.7. Declarative Programming

### 2. Systems Programming

- 2.1. File Descriptors
- 2.2. Reading and Writing Files
- 2.3. Files and Directories
- 2.4. File Locking
- 2.5. Memory Mapped I/O
- 2.6. Creating Processes
- 2.7. Process Management
- 2.8. Pipes and Signals

### 3. Classes and Objects

- 3.1. New Style Classes
- 3.2. Inheritance and Mixins
- 3.3. Properties and Slots
- 3.4. Static and Class Methods
- 3.5. Abstract Base Classes
- 3.6. Method Overriding
- 3.7. Attributes and Functors
- 3.8. Decorators and Factories
- 3.9. Descriptors and MetaClasses

### 4. Persistence and Databases

- 4.1. Shelve and Pickle
- 4.2. SQL Relational Databases
- 4.3. Connection, Cursor, Row Objects
- 4.4. Create, Read, Update, Delete
- 4.5. Error Handling
- 4.6. Query Results and Metadata
- 4.7. Create and Aggregate Functions
- 4.8. Exporting and Importing
- 4.9. Transactions and Rollbacks
- 4.10. Database Objects

### 5. Network Programming

- 5.1. Sockets and Addresses
- 5.2. Establishing Connections
- 5.3. TCP Clients and Servers
- 5.4. UDP Clients and Servers
- 5.5. UDS Clients and Servers
- 5.6. Network Objects
- 5.7. SocketServers
- 5.8. Secure Sockets Layer

### 6. Web Programming

- 6.1. JSON and XML
- 6.2. Using XML-RPC
- 6.3. Rest Interfaces
- 6.4. WSGI and HTML
- 6.5. Flask Framework
- 6.6. Controller Functions
- 6.7. Templates and Forms
- 6.8. Database ORMs

### 7. Threads and Concurrency

- 7.1. Creating and Joining Threads
- 7.2. Daemon Threads
- 7.3. Thread Objects
- 7.4. Timer Threads
- 7.5. Locks and Semaphores
- 7.6. Events and Conditions
- 7.7. Thread Locals
- 7.8. Thread Queues
- 7.9. Process Queues and Tasks
- 7.10. Process Pools

### 8. Extending and Embedding Python

- 8.1. Calling C/C++ from Python
- 8.2. Using ctypes
- 8.3. Extension Modules in C/C++
- 8.4. Raising Python Exceptions
- 8.5. Calling Python from C/C++
- 8.6. Embedding Python Interpreter
- 8.7. Importing Python Modules from C/C++
- 8.8. Converting Python Objects to C/C++
- 8.9. Invoking Python Functions from C/C++

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