

## Python Intermediate Course Plan

### 1. Modules and Libraries

- Importing and Using External Libraries
- Standard Libraries (`os`, `sys`, `re`, `datetime`, `json`)
- Creating and Importing Custom Modules
- Virtual Environments and Package Management (`pip`, `venv`)

### 2. Object-Oriented Programming (OOP) in Python

- Class and Object Basics
- Instance vs Class Variables
- Instance, Class, and Static Methods
- Encapsulation, Abstraction, and Polymorphism
- Inheritance (Single, Multiple, and Multilevel)
- `super()` Function and Method Overriding

### 3. File Handling - Advanced Concepts

- Handling CSV Files with `csv` Module
- JSON Data Handling (`json` Module)
- Working with XML Files (`xml.etree.ElementTree`)
- Pickle for Data Serialization (`pickle` Module)

### 4. Regular Expressions (`re` Module)

- Pattern Matching with `search()`, `match()`, `findall()`
- Using `re.compile()` for Complex Patterns
- Special Characters and Metacharacters
- Replacing Text with `sub()` and `subn()`

## 5. Decorators and Generators

- Understanding and Creating Decorators
- Function Wrapping with `@decorator`
- Understanding and Using `yield` for Generators
- Generator Expressions

## 6. Multithreading and Multiprocessing

- Understanding Threads and Processes
- Creating Threads with `threading` Module
- Synchronization and Locks
- Parallel Processing with `multiprocessing` Module

## 7. Advanced Exception Handling

- Raising Custom Exceptions (`raise` keyword)
- Creating Custom Exception Classes
- Handling Nested Exceptions

## 8. Database Handling with SQLite

- Introduction to Databases and SQL
- Connecting Python to SQLite (`sqlite3` Module)
- Creating, Inserting, Fetching, and Deleting Records
- Using Parameterized Queries to Prevent SQL Injection

## 9. Advanced Data Structures in Python

- Stacks and Queues using `collections.deque`
- Implementing Linked Lists
- Working with Sets and Frozen Sets
- Implementing Heaps with `heapq`

## 10. Functional Programming in Python

- Higher-Order Functions (`map()`, `filter()`, `reduce()`)
- List, Dictionary, and Set Comprehensions
- `functools` Module (`lru_cache()`, `partial()`)

## 11. Working with APIs and Web Requests

- Making API Requests with `requests` Module
- Handling API Responses (JSON & XML Parsing)
- Rate Limiting and Error Handling in APIs

**\*We suggest you to Follow this Syllabus - Recipro Skills**