

Python Curriculum (Beginner to Advanced Level)

□ Introduction to Python

- History, Features, Applications
- Installation and Setup
- First Python Program (Hello World)

□ Data Types and Variables

- Numbers (int, float, complex)
- Strings (String Methods, Slicing, Formatting)
- Lists (Indexing, Slicing, Nesting)
- Tuples (Packing, Unpacking)
- Dictionaries (Key-Value Pairs, Nested Dictionaries)
- Sets (Union, Intersection, Difference)
- Type Conversion
- Mutable vs Immutable Types

□ Operators

- Arithmetic Operators
- Comparison Operators
- Logical Operators
- Bitwise Operators
- Assignment Operators
- Membership Operators
- Identity Operators

Control Flow:

□ Conditional Statements

- if, if-else, if-elif-else
- Nested Conditions
- Ternary Operators

□ Loops

- for loop
- while loop
- Nested loops
- Loop Control Statements (break, continue, pass)
- List and Dictionary Iteration

Functions:☐ **Defining Functions**

- Parameters and Arguments
- Return Statement
- Default Arguments
- Keyword Arguments

☐ **Built-in Functions**

- range(), len(), type(), zip()
- map(), filter(), reduce()

☐ **Lambda Functions**☐ **Recursive Functions**

- Factorial Calculation
- Fibonacci Series

Data Structures:☐ **Lists**

- List Methods and Operations
- List Comprehension
- Nested Lists

☐ **Tuples**

- Tuple Methods
- Packing and Unpacking

☐ **Dictionaries**

- Dictionary Methods
- Dictionary Comprehension

☐ **Sets**

- Set Methods
- Frozen sets

Object-Oriented Programming:☐ **Classes and Objects**

- Creating Classes and Objects
- Instance Variables and Methods

☐ **Constructors**☐ **Inheritance**

- Single Inheritance
- Multiple Inheritance
- Multilevel Inheritance

☐ **Polymorphism**

- Method Overloading
- Method Overriding

☐ **Encapsulation**

- Private and Protected Members

File Handling:☐ **Reading and Writing Files**

- Text Files
- Binary Files
- File Modes

☐ **File Methods**

- read(), readline(), readlines()
- write(), writelines()

☐ **Exception Handling**

- try, except, else, finally
- Raising Exceptions
- Custom Exceptions

Modules and Packages:

- Creating and Importing Modules
- Built-in Modules (os, sys, math, random)
- pip and Virtual Environments
- Creating Packages
- init.py

Advanced Concepts:☐ **Regular Expressions**

- re Module
- Match, Search, Find all

☐ **Decorators**

- Function Decorators
- Class Decorators

☐ Generators

- yield keyword

☐ Multithreading

- Thread Module
- Thread Synchronization

☐ Database Connectivity (MySQL, SQLite)

- Connecting to Databases
- Executing Queries

Libraries

☐ NumPy

- Arrays
- Array Operations

☐ Pandas

- Data Frames
- Data Cleaning

☐ CSV & JSON Parsing

- json Module
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☐ **Bonus Resources: Interview-Cracking Companion:**

☐ **Python - Interview Q&A PDF**