

Python Syllabus

1. An Introduction to Python

- What is Python and history of Python
- Features of Python
- Installation and Working with Python
- Understanding Python variables
- Python basic Operators
- Python Identifiers, Keywords, and Indentation
- Understanding Python blocks
- Command line arguments
- Getting User Input
- Python Data Types
- What are variables?
- Python Core objects and Functions

2. Program Flow Control

- Conditional blocks using if, else, and else if
- For loops in Python
- For loop using ranges, string, list, and dictionaries
- Use of while loops in Python
- Loop manipulation using pass, continue, break, and else
- Programming using Python conditional and loops block

3. Logic Building

- Condition Based Problems
- Looping Related Problems
- Numeric Logical Problems
- String Logical Problems
- Sorting Problems
- Design Patterns

4. Lists, Ranges, Dictionaries, Tuples, and Sets in Python

- Introduction
- Lists in Python
- Understanding Iterators, Generators, Comprehensions and Lambda Expressions
- Generators and Yield
- Next and Ranges

- Understanding and using Ranges
- Python Dictionaries
- Dictionary manipulation
- Ordered Sets with tuples
- Sets
- Python Sets Examples

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5. Object Oriented Programming in Python

- OOPS Concepts
- Concept of class, object, and instances
- Constructor, class attributes, and destructors
- Accessing attributes
- Built-In Class Attributes
- Inheritance
- Polymorphism (overriding and overloading)
- Achieving Abstraction
- Encapsulation

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6. Exception Handling in Python

- Exceptions Handling Introduction
- Avoiding code break using exception handling
- Handling various exceptions using try, except, else
- Try-finally clause
- Try-except-finally with return keyword
- Argument of an Exception and create self-exception
- Exception Classes Hierarchy
- Raising an exceptions
- Custom (User-Defined) Exceptions

7. File Input and Output in Python

- Reading and writing text files
- Reading config files in Python
- Writing log files in Python
- Understanding built-in functions
- Writing Binary Files Manually
- Using Pickle to Write Binary Files
- Manipulating file pointer using seek

8. Decorators, Iterators, and Comprehensions

- Iterables
- Generators
- Yielding from the generators
- Inner Functions
- Decorators
- Comprehensions - List, Set & Dict

9. Multithreading in Python Programs

- What is multithreading?
- Single vs. Multithreaded Apps
- Starting a New Thread
- Forking threads
- The Threading Module
- Class level & Object level Locks
- Synchronizing Threads

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10. Structured Query Language

- MySQL Introduction
- Data Types
- DDL, DML, TCL
- Constraints
- DISTINCT Clause
- WHERE Clause
- Pattern identification using wildcard operators
- MySQL Conditions (AND, OR, BOOLEAN, LIKE, IN)
- MySQL Functions (MIN, MAX, AVG, SUM, COUNT)
- ORDER BY Clause
- GROUP BY Clause
- Relationships in SQL
- Joins in SQL

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11. Python Database Connectivity (PDBC)

- SQL Database connection using Python
- Install the MySQL DB and other Packages
- DML and DDL Operations with Databases
- Performing Transactions
- Handling Database Errors
- Disconnecting Database

- CRUD Operation Project using PDBC

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12. SQLAlchemy - Object Relational Mapper

- ORM Introduction
- SQLAlchemy Overview
- SQLAlchemy over PDBC
- Advantages of SQLAlchemy
- Classical Way of Mapping
- Declarative Way of Mapping
- DML and DDL Operations with Database
- Queries in SQLAlchemy
- Applying Filters

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13. HTML5

- Introduction
- Basic Formatting Tags
- Grouping Using Div Span
- Lists
- Images
- Hyperlink
- Table
- Iframe
- Form
- Headers
- Miscellaneous

14. CSS2

- Introduction
- Syntax
- Selectors
- Color Background Cursor Text Fonts
- Lists Tables
- Box Model
- Display
- Positioning Floats

15. JavaScript

- Introduction
- JS in HTML
- HTML DOM (Document Object Model)
- JS Console
- JS Debugging
- JS Var & Arrays
- JS Objects & Functions
- JS Dialog Boxes
- JS JSON
- HTML Attributes

16. Django Framework

- Basics of Django Framework & its uses
- Installation and setting up Django
- Django with PyCharm CE
- Virtual Environments
- Templates in Django & Template Inheritance Context
- Static Files in Django
- Syntax and URL Routing in Django
- Request / Response Architecture in Django
- Relationships in Models
- Handling various Databases in Django
- Django-ORM
- Queries of Django-ORM
- Function-based Views
- Class-based Views
- Forms - HTML, Model & Django Forms
- Crispy Forms
- Django Signals
- Middlewares in Django
- CRUD Operations using Model Forms
- Form Validation
- Custom user models
- Cookies & Session in Django
- User Authentication (Login, Logout, SignUp)

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