

Core Syllabus

1. Program Logic & Flowcharts

- Introduction to Programming Logic
 - Problem-Solving Methodologies
 - Algorithms & Flowcharts
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2. Introduction to Python

- Key Features of Python
 - Running Python Programs
 - Identifiers & Reserved Keywords
 - Variables & Comments
 - Indentation & Code Blocks
 - Single-Line & Multi-Line Statements
 - Grouping Multiple Statements (Suite)
 - Working with Quotes
 - Input, Output & Import Functions
 - Displaying Output
 - Reading Input
 - Using Import Function
 - Operators in Python
 - Arithmetic | Comparison | Assignment
 - Bitwise | Logical | Membership | Identity
 - Operator Precedence
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3. Data Types & Operators

- **Numbers**
 - Mathematical, Trigonometric & Random Functions
 - **Strings**
 - Escape Characters, Formatting Operators & Functions
 - **Lists**
 - Built-in Functions & Methods
 - **Tuples**
 - Built-in Functions
 - **Sets & Frozensets**
 - Set Functions & Methods
 - **Dictionaries**
 - Dictionary Functions & Methods
 - Mutable vs Immutable Objects
 - Data Type Conversion
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4. Flow Control

- **Decision Making**
 - if, if-else, if-elif-else, Nested if
 - **Loops**
 - for, while, and loop-else statements
 - **Nested Loops**
 - **Control Statements**
 - break, continue, pass
 - **Loop Types**
 - Infinite | Top-Tested | Mid-Tested | Bottom-Tested
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5. Functions

- Defining & Calling Functions
 - Function Arguments
 - Required | Keyword | Default | Variable-Length
 - Anonymous (Lambda) Functions
 - Uses and Applications
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6. Modules & Packages

- Built-in Modules
 - Creating Custom Modules
 - Importing Modules
 - `import`, `from-import`, `import *`, Renaming Imports
 - Module Search Path & `PYTHONPATH`
 - Namespaces & Scope
 - Useful Functions: `dir()`, `reload()`
 - Working with Packages
 - Date & Time Modules
 - `time`, `calendar`, `datetime`
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7. File Handling

- Opening Files (Modes & Attributes)
 - Reading & Writing Files
 - Closing Files Safely
 - File Methods
 - Renaming & Deleting Files
 - Directory Operations
 - `mkdir()`, `chdir()`, `getcwd()`, `rmdir()`
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8. Object-Oriented Programming (OOP)

- Defining Classes & Creating Objects
 - Class Attributes & Methods
 - Constructors & Destructors
 - Encapsulation & Data Hiding
 - Inheritance
 - Single, Multilevel, Multiple
 - Base Class Constructor Invocation
 - Method Overriding
 - Polymorphism & Operator Overloading
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9. Exception Handling

- Built-in Exceptions
 - Handling with `try`, `except`, `finally`
 - Multiple Exception Clauses
 - Raising Exceptions
 - Exception Arguments
 - Assertions
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10. Regular Expressions

- Functions: `match()`, `search()`, `findall()`, `compile()`
 - Search & Replace Patterns
 - Modifiers (Option Flags)
 - Character Classes & Special Classes
 - Repetition Cases
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11. Database Programming Basics

- Connecting to Databases
 - Creating & Managing Tables
 - CRUD Operations (Insert, Update, Delete, Select)
 - Transaction Control
 - COMMIT, ROLLBACK
 - Disconnecting from Databases
 - Exception Handling in Database Operations
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