

PYTHON FOR AI

Start your journey towards AI the right way.

LEARN → BUILD → SHOWCASE

Python • SQL • Machine Learning • DSA
GitHub • Professional Portfolio

03 MONTHS

Course duration

1 HOUR DAILY

Online live classes

SATURDAYS

Practice + doubts

Course objective

Build strong foundations in Python, SQL/DBMS, Machine Learning, DSA, GitHub and professional branding, with continuous coding practice, assessments and a portfolio of 5+ projects.

Python — Basic to Advanced + Projects

30 hours

DBMS + SQL

18 hours

Introduction to Machine Learning

4.5 hours

DSA with Python — Elementary

15 hours

GitHub

3 hours

LinkedIn / Professional Profile

1.5 hours

TOTAL LEARNING HOURS

72

Python & programming

Lessons 01–05 / Basics to advanced + projects

01

Python & Programming Foundation

Topics Programming fundamentals, Why Python for AI/Data Science, Python features and applications, Interpreter vs compiler, Python execution, VS Code/Jupyter, .py vs .ipynb

Practical Hello World; Basic print statements; First Python program

Assessment Install/configure Python and create a first program

02

Variables & Data Types

Topics Variables and naming conventions, Dynamic typing, int, float, str, bool, None, type() and id()

Practical Student/employee information variables; Inspect data types

Assessment Create a student information program

03

Input, Output & Type Casting

Topics input(), print(), Multiple variables, int(), float(), str(), bool(), Type conversion

Practical Student information program; Simple calculator

Assessment Build a student information system

04

Operators

Topics Arithmetic, Comparison, Assignment, Logical, Membership, Identity, Bitwise

Practical Salary calculator; Shopping bill; Result calculator

Assessment Create programs using and/or/not/in/is

05

Conditional Statements

Topics if, if-else, if-elif-else, Nested conditions, Multiple conditions, and/or/not

Practical Grade calculator; Login validation; Loan eligibility

Assessment Create an eligibility/result application



Python & programming

Lessons 06–10 / Basics to advanced + projects

06

Loops

Topics for, while, range(), Nested loops, Loop control

Practical Tables; Sum; Factorial; Prime; Fibonacci

Assessment Solve 10 loop problems

07

Break, Continue & Pass

Topics break, continue, pass, Nested loops

Practical Number guessing game; Menu-driven program

Assessment 20-question Python assessment + 5 coding problems

08

Strings

Topics String creation, Indexing, Negative indexing, Slicing, String methods

Practical upper/lower; strip; replace; split; join; find; count

Assessment Build a text-processing application

09

Lists

Topics List creation, Indexing, Slicing, Nested lists, List operations

Practical append; extend; insert; remove; pop; sort; reverse

Assessment Student marks management

10

Tuple, Set & Dictionary

Topics Tuple, Set, Dictionary, Data structure comparison, Dictionary methods, Set operations

Practical Student database using dictionary

Assessment Build a small record-management program

Python & programming

Lessons 11-15 / Basics to advanced + projects

11

Comprehensions

Topics List comprehension, Conditional comprehension, Nested comprehension, Dictionary comprehension, Set comprehension

Practical Create square/even/filtered collections

Assessment 10 comprehension problems

12

Functions

Topics Function definition, Parameters, Arguments, return, Default/keyword arguments, *args, **kwargs, Scope

Practical Reusable utility functions

Assessment Build a function-based application

13

Lambda, Map, Filter & Reduce

Topics Lambda, map(), filter(), reduce(), sorted(key=...)

Practical Lambda transformations; Filtering; Aggregation

Assessment 20 lambda/map/filter/reduce problems

14

Modules & Packages

Topics import, Modules, Packages, pip, Virtual environments, requirements.txt

Practical Create a custom module/package

Assessment Build a reusable Python utility package

15

File Handling

Topics Text files, Read/write/append, with open(), CSV, JSON

Practical Read/write student records; CSV and JSON handling

Assessment Student record system using files

Python & programming

Lessons 16–20 / Basics to advanced + projects

16

Exception Handling

Topics Errors vs exceptions, try/except/else/finally, Multiple exceptions, Custom exceptions

Practical Robust calculator; Input validation

Assessment Add error handling to an existing project

17

OOP Fundamentals

Topics Class, Object, Attributes, Methods, Constructor, self

Practical Student class; Employee class

Assessment Create an object-oriented mini application

18

OOP Advanced

Topics Encapsulation, Inheritance, Polymorphism, Abstraction, Class variables, Static methods, Instance methods

Practical Employee Management System

Assessment Complete OOP-based mini project

19

Python for Data/AI

Topics NumPy basics, Arrays, Vectorization, Pandas Series/DataFrame, CSV reading, Basic analysis

Practical df.head(); df.info(); df.describe(); Basic filtering

Assessment Student performance analysis

20

Python Capstone & Assessment

Topics Project architecture, Code organization, Testing/debugging, Project presentation

Practical Choose and build: Student Management, Expense Tracker, Employee System, Sales Analysis, E-commerce Analyzer

Assessment 20 MCQs + 10 coding problems + practical + project presentation

DBMS + SQL

Lessons 21–26 / Relational data, queries & reporting

21

DBMS Fundamentals

Topics Data, database, DBMS, RDBMS, Tables, rows, columns, Primary/foreign keys, Relationships, MySQL/PostgreSQL

Practical Create academy database

Assessment Design a simple relational database

22

SQL Basics

Topics SELECT, FROM, WHERE, ORDER BY, DISTINCT, LIMIT

Practical Student database queries

Assessment 20 SQL query exercises

23

DDL

Topics CREATE, ALTER, DROP, TRUNCATE

Practical Create and modify tables

Assessment Build academy database schema

24

DML + CRUD

Topics INSERT, UPDATE, DELETE, SELECT, CRUD concept

Practical Student CRUD operations

Assessment Create CRUD query set

25

SQL Operators

Topics Arithmetic, Comparison, Logical, IN, BETWEEN, LIKE, IS NULL

Practical Filtering customer/student data

Assessment 25 filtering exercises

26

Aggregate Functions & GROUP BY

Topics COUNT, SUM, AVG, MIN, MAX, GROUP BY, HAVING

Practical Sales analysis

Assessment Solve grouped business-analysis queries

DBMS + SQL

Lessons 27–32 / Relational data, queries & reporting

27

SQL Joins

Topics INNER JOIN, LEFT JOIN, RIGHT JOIN, FULL JOIN, SELF JOIN, CROSS JOIN

Practical Customers + Orders database

Assessment 20 join problems

28

Subqueries

Topics Single-row, Multi-row, Correlated, Nested subqueries

Practical Employee/customer analysis

Assessment Advanced subquery assignment

29

Constraints & Database Design

Topics PRIMARY KEY, FOREIGN KEY, UNIQUE, NOT NULL, CHECK, DEFAULT, Referential integrity, Normalization basics

Practical Design relational tables

Assessment Normalize a sample database

30

DCL + TCL

Topics GRANT, REVOKE, COMMIT, ROLLBACK, SAVEPOINT, Transactions

Practical Transaction scenarios

Assessment Write transaction-management exercises

31

Advanced SQL

Topics CASE, COALESCE, NULL handling, String functions, Date functions, Math functions

Practical Business reporting queries

Assessment Advanced SQL worksheet

32

SQL Project & Assessment

Topics Database project design, Query optimization basics, Reporting

Practical E-commerce DB: Customers, Products, Orders, OrderDetails, Payments

Assessment 25 real-world SQL queries + assessment

Machine Learning

An introduction to AI concepts and your first predictive model

33

AI, ML & Data Science Foundations

Topics AI, Machine Learning, Deep Learning, Generative AI, Data Science, ML lifecycle, Features/target, Training/testing/prediction

Practical Map an AI/ML problem to the ML lifecycle

Assessment Create an ML terminology sheet

34

Types of Machine Learning

Topics Supervised: regression/classification, Unsupervised: clustering/dimensionality reduction, Reinforcement learning basics

Practical Build an ML workflow diagram

Assessment Identify the ML type for 15 real-world problems

35

First ML Model

Topics Linear Regression, X/y, train/test split, fit, predict, MAE, MSE, RMSE, R^2

Practical House price prediction with scikit-learn

Assessment Complete a first ML project



PROJECT FOCUS

House Price Prediction

Pandas, EDA, train/test split, Linear Regression and evaluation.

DSA with Python

Lessons 36–40 / Elementary algorithms & problem solving

36

DSA Fundamentals

Topics What is DSA?, Algorithms, Data structures, Time/space complexity, Big O

Practical Analyze simple algorithms

Assessment Big-O worksheet

37

Arrays & Lists for DSA

Topics Traversal, Searching, Insertion, Deletion, Max/min, Frequency

Practical Largest; Second largest; Remove duplicates; Reverse

Assessment 10 array/list problems

38

Strings for DSA

Topics String traversal, Frequency, Palindrome, Anagram, Duplicates

Practical Reverse; Character frequency; First non-repeating character

Assessment 10 string problems

39

Searching Algorithms

Topics Linear search, Binary search, When to use each, Complexity

Practical Implement both manually

Assessment Search problem set

40

Sorting Algorithms

Topics Bubble sort, Selection sort, Insertion sort, sort(), sorted()

Practical Implement and compare sorting

Assessment Sorting problem set

DSA with Python

Lessons 41–45 / Elementary algorithms & problem solving

41

Stack

Topics LIFO, Push, Pop, Peek, Stack applications

Practical Parentheses matching; Undo/browser history concept

Assessment Implement stack using Python

42

Queue

Topics FIFO, Enqueue, Dequeue, Circular queue, collections.deque

Practical Task/printer scheduling

Assessment Implement queue

43

Linked List

Topics Node, Head, Traversal, Insert, Delete, Search

Practical Implement singly linked list

Assessment Linked-list problem set

44

Recursion

Topics Base condition, Recursive condition, Call stack

Practical Factorial; Fibonacci; Sum of digits; Reverse string; Binary search

Assessment 10 recursion problems

45

DSA Assessment & Project

Topics Problem-solving patterns, Debugging, Complexity review

Practical Student Ranking System using lists, dictionaries, searching and sorting

Assessment 25 coding problems + project assessment

Industry preparation

Document your work and build a professional technical portfolio

46

Git & GitHub Fundamentals

Topics Git vs GitHub, Repository, Local/remote, Clone, Add, Commit, Push, Pull, Branch

Practical git init; git status; git add; git commit; git push

Assessment Create and push first repository

47

GitHub Project & Portfolio

Topics README, .gitignore, requirements.txt, Branches, Pull requests, Profile, Project documentation

Practical Upload Python/ML project

Assessment Document and publish a project

48

LinkedIn & Professional Profile

Topics Professional headline, About section, Skills, Projects, Certifications, GitHub integration, Resume alignment, Technical posts, Networking

Practical Create/update LinkedIn profile; Write project descriptions

Assessment Complete professional portfolio: LinkedIn → GitHub → Projects → Resume



YOUR PROFESSIONAL PORTFOLIO

LinkedIn → GitHub → Projects → Resume

Publish your work with clear project descriptions and documentation.

Build. Document. Present.

Five core projects + one optional integrated project

01 Student Management System

Python, functions, lists, dictionaries, file handling, exceptions

02 Expense Tracker

Python, CSV, functions, Pandas, data analysis

03 E-Commerce Database

DBMS, SQL, CRUD, joins, GROUP BY, subqueries

04 Student Ranking System

DSA, lists, sorting, searching, dictionaries, algorithms

05 House Price Prediction

Pandas, EDA, train/test split, Linear Regression, evaluation

06 Employee Analytics System — Optional

Python + SQL + Pandas

EXPECTED OUTCOME

After 3 months, students should be able to write structured Python programs, work with relational databases and SQL, understand the complete basic Machine Learning workflow, solve elementary DSA problems, use Git/GitHub for project management, and present a professional technical portfolio.