

Python Programming & Software Development

Become a production-minded Python developer by building APIs, databases, tests, packages, automation and a deployed software capstone.

**8 weeks**

DURATION

72 hours

GUIDED LEARNING

2 projects

PORTFOLIO

ABOUT THE ACADEMY

Practical learning. Work you can demonstrate.

Brightnest AI Academy brings live instruction, guided practice and career preparation together for individuals and teams.

23

FOCUSED COURSES

6

FLAGSHIP PROGRAMMES

Noida

ACADEMY LOCATION

Our approach

1

Learn

Understand concepts through live instruction and current examples.

2

Build

Apply learning through labs, assignments and guided projects.

3

Explain

Document decisions, results, trade-offs and limitations.

4

Prepare

Connect completed work with CVs, interviews and workplace conversations.

PEOPLE BEHIND THE ACADEMY

Meet Ranjeet Kumar



ACADEMY ADVISER

Ranjeet Kumar

Innovation & Growth Leader

15+ years

Experience in data, artificial intelligence and machine learning leadership.

Areas of expertise

- Data science and machine learning solution leadership
- AI product strategy and scalable data platforms
- Technology team leadership and mentorship
- Practical AI and data adoption for business transformation

Education

Master of Information Systems, Anna University, Chennai
Bachelor of Computer Science Engineering



COURSE OVERVIEW

Build your next set of skills

Build robust applications with Python, APIs, testing and software engineering fundamentals. Progress from Python Programming Foundations to Deployment and Python Software Capstone through guided labs, assessed projects, and portfolio evidence.

Who this is for

Beginners and career switchers who want practical Python software-development and backend skills.

Before you begin

No prior programming experience is required, though basic computer literacy is expected.

Professional Python development goes beyond syntax: learners need structure, testing, APIs, data access, automation, packaging, deployment, and maintainable code.



LEARNING OUTCOMES

What you will be able to do

01

Build a command-line utility with validation, logging and clean functions.

02

Implement small utilities that process files and collections efficiently.

03

Design a small domain model and refactor for testability and typing.

04

Build an API client that ingests data concurrently and stores normalised results.

05

Build a CRUD data layer backed by PostgreSQL/SQLite with migrations.

06

Create a test suite and package the application for repeatable installation.

07

Build, test, containerise and deploy a complete Python service with documentation and CI.

CURRICULUM

Course curriculum

8 modules · 8 weeks · 72 hours of guided learning

01 Python Programming Foundations

6 hours

TOPICS

Python setup · Syntax · Variables · Strings · Numbers · Control flow · Functions · Debugging · Code style · Git workflow

PRACTICAL WORK

Build a command-line utility with validation, logging and clean functions.

Tools: Python 3, VS Code, Git

Assessment: Coding checkpoint

Portfolio evidence: Python CLI project

02 Data Structures, Algorithms and Pythonic Code

8 hours

TOPICS

Lists · Dicts · Sets · Tuples · Comprehensions · Iterators/generators · Sorting · Complexity basics · Reusable patterns

PRACTICAL WORK

Implement small utilities that process files and collections efficiently.

Tools: Python

Assessment: Coding exercises

Portfolio evidence: Python problem-solving repository



CURRICULUM

Course curriculum

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03 Object-Oriented Design and Type-Safe Python

8 hours

TOPICS

Classes · Composition · Inheritance · Dataclasses · Protocols/interfaces concepts · Type hints · Mypy concepts · Exceptions · Logging · Clean architecture basics

PRACTICAL WORK

Design a small domain model and refactor for testability and typing.

Tools: Python, Typing tools optional

Assessment: Code review

Portfolio evidence: Typed Python package

04 Files, APIs and Asynchronous I/O

8 hours

TOPICS

JSON/CSV · pathlib · HTTP clients · REST concepts · Authentication · Retries · Rate limits · Async/await · Concurrency tradeoffs

PRACTICAL WORK

Build an API client that ingests data concurrently and stores normalised results.

Tools: Python, httpx/requests, asyncio

Assessment: Integration lab

Portfolio evidence: API integration service



CURRICULUM

Course curriculum

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05 Databases and Persistence

8 hours

TOPICS

SQL basics · Relational modeling · Transactions · ORM concepts · Migrations · Connection management · Repository pattern · Data validation

PRACTICAL WORK

Build a CRUD data layer backed by PostgreSQL/SQLite with migrations.

Tools: PostgreSQL/SQLite, SQLAlchemy concepts

Assessment: Database lab

Portfolio evidence: Database-backed Python app

06 Web APIs with FastAPI

10 hours

TOPICS

Routing · Request/response models · Validation · Dependency injection · Authentication concepts · OpenAPI · Error handling · Pagination · Background tasks

PRACTICAL WORK

Build a documented REST API with validation, auth-ready design and database integration.

Tools: FastAPI, Pydantic

Assessment: API practical

Portfolio evidence: Production-style FastAPI service



CURRICULUM

Course curriculum

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07 Testing, Packaging and Developer Quality

8 hours

TOPICS

pytest · Fixtures · Mocking · Integration tests · Coverage · Linting/formatting · Packaging · Pyproject · Dependency management · Logging · Configuration

PRACTICAL WORK

Create a test suite and package the application for repeatable installation.

Tools: pytest, Ruff/Black concepts, Packaging tools

Assessment: Quality gate

Portfolio evidence: Tested Python package

08 Deployment and Python Software Capstone

16 hours

TOPICS

Docker · Environment variables · Secrets · CI/CD · Application server concepts · Monitoring · Performance profiling · Security basics · Deployment

PRACTICAL WORK

Build, test, containerise and deploy a complete Python service with documentation and CI.

Tools: Docker, GitHub Actions, Cloud platform

Assessment: Capstone demo

Portfolio evidence: Deployed Python software project

APPLIED PORTFOLIO

Projects you will build

Two portfolio projects supported by guided module work.

PORTFOLIO PROJECT 1

Production Python REST Service

Build a tested FastAPI service with database, validation, packaging, Docker and CI.

DELIVERABLES

Source code · Tests · OpenAPI · Docker · CI · Deployment URL

PORTFOLIO PROJECT 2

Python Automation Service

Automate a recurring data/API workflow with scheduling, logging and error recovery.

DELIVERABLES

Package · Configuration · Tests · Logs · Operational guide

LEARNING EXPERIENCE

Learn, practise and present

- Live instructor-led sessions that connect concepts to real workplace decisions.
- Guided labs and workshops in every module.
- Assignments, checkpoints and practical feedback.
- Portfolio documentation, demonstrations and capstone review.
- Access to recordings and LMS resources according to the published batch policy.
- Career preparation based on completed work and target roles.

Tools you will work with

Python 3 · VS Code · Git · Python · Typing tools · httpx · requests · asyncio · PostgreSQL · SQLite · SQLAlchemy concepts · FastAPI · Pydantic · pytest · Ruff · Black concepts

CAREER PREPARATION

Build confidence for interviews

A structured process to connect your learning with your next career step.

01**Role clarity**

Identify roles that fit your background, interests and current skills.

02**Profile readiness**

Review your CV, LinkedIn, GitHub and project summaries.

03**Project proof**

Prepare to demonstrate completed work and explain your decisions.

04**Interview practice**

Practise technical questions, project walkthroughs and interviews.

05**Opportunity updates**

Receive relevant job openings and employer requirements, subject to availability and learner readiness.

Career support helps you prepare. Employment outcomes depend on experience, project quality, interview readiness and market conditions.

LEARNER JOURNEYS

Companies where our learners have been hired

Across the Brightnest AI Academy learner community



Learner employment history across the academy; not a placement guarantee for this course. Names and logos identify employers; they do not imply endorsement or a hiring partnership.

BEFORE YOU ENROL

Your questions, answered

Is the Python Software Development course suitable for beginners?

This course progresses from foundation to intermediate level. No prior programming experience is required, though basic computer literacy is expected.

What will I build during the course?

You will complete guided labs in every module and build two portfolio projects: Production Python REST Service and Python Automation Service. Deliverables include working files or code, documentation, testing or evaluation evidence, and a final presentation.

Which tools and platforms are covered?

Key tools include Python 3, VS Code, Git, Python, typing tools, httpx, requests, and asyncio. Additional platforms are introduced in relevant modules through practical tasks, and the toolset may evolve as industry practice changes.

How long does the course take?

The course includes approximately 72 guided learning hours across 8 modules, delivered over 8 weeks.

Which career paths can this course support?

The curriculum supports the development of skills relevant to roles such as Python Developer, Backend Developer and Software Engineer. Career outcomes depend on prior experience, project quality, interview readiness and market conditions; employment is not guaranteed.

BEFORE YOU ENROL

Your questions, continued

Will I receive mentor and career support?

The course includes live instruction, lab support, assignment feedback, project reviews and career preparation covering portfolio development, CV writing, LinkedIn profile improvement, and interview guidance.

FEES & ADMISSIONS

Plan your next step

COURSE FEE

INR 35,000 + GST

EMI and easy instalments available

Duration	8 weeks
Level	Foundation-Intermediate
Learning format	Live mentor-led learning
Batch starts	Expected Saturday / Sunday starts

Check the live Batches page for the next expected weekend. Confirm the exact date, class times and availability with admissions.

Book a free demo class >

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