Python Interns Training

Month 1 (Basics 1–5 Weeks)

Python

- Basics
- Problem solving
- Data Structures
- Numpy, Pandas
- SpaCy
- FastAPI

AI

- Gemini / OpenAI SDK

Version Control

- Git/Github

Month 2 (Advanced 4–6 Weeks)

- Chatbot (Link)
- Chatbot with Persona (Link)
- RAG (Link)
- Containerization (Railway) (Docker YT, Docker YT-2, Docker Read)
- LangChain (Link, Link, YT)
- LangGraph (Link, Link, YT)
- Projects

MONTH 1: FOUNDATIONS

Week 1: Python Basics + Problem Solving

- Python environment, syntax
- Variables, types
- Conditions, loops
- Functions
- Problem-solving patterns
- Mini challenges daily

Week 2: Data Structures + Algorithms

- Lists, tuples, sets, dicts
- Comprehensions
- Iteration techniques
- Error handling
- File I/O
- Searching (linear + binary)
- Sorting basics (Bubble Sort, python built-in)
- Practical coding problems

Week 3: Core Libraries for AI Engineering

- NumPy (arrays, indexing, operations)
- Pandas (DataFrames, filtering, merges, groupby)
- Matplotlib (basic plotting only)
- SpaCy (tokenization, POS, NER basics)

Week 4: Backend + AI SDK Fundamentals

- Git & GitHub basics
- FastAPI basics (routes, request/response models)
- Build a small API
- Gemini/OpenAI SDK
- Build a simple LLM-powered API (summarizer / sentiment)

Day-by-Day Breakdown for the First Month

Week 1: Python Basics + Problem Solving

Day 1

- Intro to Python
- Installing Python, VS Code
- Basic syntax, input/output
- Variables & datatypes
- Mini exercises

Day 2

- Conditions (if/elif/else)
- Boolean logic
- Practical problems (grading system, menu, ticket pricing)

Day 3

- Loops: for/while
- break/continue
- Pattern problems & iterations

Day 4

- Functions
- Parameters, return values
- Pure functions vs side effects
- 10–15 function exercises

Day 5

- Problem-solving Day
- HackerRank/LeetCode style basics
- Assess logic & reasoning

Week 2: Data Structures & Algorithms

Day 6

- Lists
- Methods, slicing, iteration
- List problems

Day 7

- Dictionaries + Sets
- Use cases

- Practical problems

Day 8
- Tuples
- Comprehensions (list, dict)
- File I/O
- Error handling (try/except)

Day 9

1. Searching
    a. Linear
    b. Binary search
2. Sorting
    a. Bubble sort
3. Practical algorithm problems

Day 10
- Mixed DS problem-solving
- Build 1–2 mini apps (Todo app CLI, dictionary lookup app)

Week 3: NumPy, Pandas, Visualization, NLP Libraries

Day 11: **NumPy**
1. Arrays
2. Indexing
3. reshaping
4. Math operations

Day 12: NumPy + Pandas
- Pandas Series
- DataFrame creation
- Loading CSVs
- Basic filtering

Day 13: Pandas (Deep Dive)
- groupby
- merge/join
- apply/map
- Handling missing values

Day 14: Matplotlib + SpaCy
- Basic visualizations

- SpaCy: tokenization, POS, NER
- Small NLP tasks

Day 15: Mini Project
- Build a tiny text-cleaning pipeline
- Assessment

Week 4: FastAPI + Git + LLM SDK (OpenAI/Gemini)

Day 16: Git/GitHub
- Git basics
- Cloning, commits, branching
- Pull requests, repo workflow

Day 17: FastAPI
- Routes
- Query & body parameters
- JSON responses
- Async basics

Day 18: FastAPI Advanced
- Request/response models
- Middleware basics
- Build 2 APIs (e.g., BMI calculator + text cleaner)

Day 19: Gemini/OpenAI SDK
- Using the client
- Completion API
- Chat API
- Build a simple summarizer + sentiment analyzer

Day 20: Final Review + Assessment
- Python coding challenges
- Mini FastAPI + SDK project

Learning Resources:

1. Python Blog (Link)
2. Intro to Python - Blog and Course (Link)
3. W3Schools Python (Link)
4. Python Crash Course with Mosh (Link)