🚀 Self-Led Learning Plan for Trainee Engineers

Motto: Learn by doing. Stay curious. Build projects, not just notes.

This guide is designed as a checkpoint-driven roadmap. Treat each checkpoint as a milestone—don’t just “read/watch,” but practice, build, and reflect.

# ✅ Getting Started – Mindset for Self-Learning

* Block 2–3 hrs/day consistently for learning.
* Maintain a Learning Journal – write 3 things you learned every day.
* Follow the “Build Small → Scale Big” principle.
* At every checkpoint, ask yourself:

• Can I explain this in my own words?

• Can I build a small example project with it?

Module -I

# 🐍 Python Foundations (Checkpoint 1) – 6 hrs

Goal: Get comfortable writing clean Python code.

* Learn & practice: Data types, loops, conditionals, functions.
* Master comprehensions – list/dict/set.
* Practice error handling with try/except.
* Mini Task: Write a program to read a JSON file and filter specific records using a comprehension.
* 💡 Tip: Think of comprehensions as “one-liner filters”—super useful in LangChain.

# 🏗️ OOP + Decorators (Checkpoint 2) – 7 hrs

Goal: Think modular, reusable, and service-oriented.

* Practice Classes & Objects, Inheritance, Composition.
* Explore @classmethod and @staticmethod.
* Create your own decorator (e.g., for logging function calls).
* Mini Task: Build a small library management system with classes.
* 💡 Tip: Decorators = reusable wrappers. Think of them like middleware.

# 🔥 Advanced Python (Checkpoint 3) – 9 hrs

Goal: Write professional-level Python code.

* Learn type hints and why they matter.
* Explore \_\_init\_\_, \_\_main\_\_, imports, and modules.
* Use context managers (with open(...)).
* Understand generators & iterators.
* Mini Task: Process a large file line by line using a generator.
* 💡 Tip: Use pathlib for file handling—it’s cleaner.

## 📦 Project Files

Below are some projects that let you refresh fundamental concepts.

### Python Projects

* PY-1.1: Python Basics - python-fundamentals01.zip
* PY-1.2: Python OOPS Concepts Refresh - python-oop-practice02.zip
* PY-1.3: Python Intermediate - python-intermediate03.zip
* PY-1.4: Python Advanced - python-advanced04.zip