

# Learning Path: Topics Covered

Below is the **day-by-day breakdown** for the 60 days. Follow in order for best results, or pick topics as needed.

## Basics (Day 1–15)

- **Day 01 – Intro and Setup:** Install Python, set up VS Code/IDE, run scripts
- **Day 02 – Variables:** variable naming, assignment, immutable vs mutable basics
- **Day 03 – Data Types:** int, float, str, bool, None
- **Day 04 – Operators:** arithmetic, comparison, logical, assignment
- **Day 05 – Conditional Statements:** if, elif, else, ternary expressions
- **Day 06 – Loops:** for, while, break, continue, else with loops
- **Day 07 – Functions Basics:** define, call, return, docstrings
- **Day 08 – Function Parameters & Scope:** positional, keyword, default, \*args/\*\*kwargs, scope rules
- **Day 09 – String Methods:** slicing, formatting, methods (split, join, replace)
- **Day 10 – Number & Math Methods:** math module, rounding, random basics
- **Day 11 – List Basics:** create, access, mutate lists
- **Day 12 – List Methods:** append, extend, pop, remove, sort, reverse
- **Day 13 – Mini Project: Simple Calculator**
- **Day 14 – Tuples and Sets:** immutability, set operations
- **Day 15 – Dictionaries:** key/value pairs, iteration, common dict methods

## Intermediate (Day 16–30)

- **Day 16 – Revision and Quiz**
- **Day 17 – File Handling:** open, read, write, with-blocks
- **Day 18 – Exception Handling:** try, except, finally, custom exceptions
- **Day 19 – Modules and Packages:** import patterns, `__init__.py`
- **Day 20 – OS Module:** file paths, listing directories, environment variables
- **Day 21 – Random Module:** random choices, shuffle, seeds
- **Day 22 – List Comprehensions:** comprehension syntax and use-cases
- **Day 23 – Lambda Functions:** anonymous functions and small utilities
- **Day 24 – Map, Filter, Reduce:** functional tools for lists
- **Day 25 – Mini Project: Student Record Manager**
- **Day 26 – Classes and Objects:** OOP basics, attributes, methods
- **Day 27 – Inheritance:** base and derived classes, method overriding
- **Day 28 – Encapsulation:** private/protected conventions, property decorators
- **Day 29 – Polymorphism:** duck typing, polymorphic interfaces
- **Day 30 – Special Methods:** `__init__`, `__str__`, `__repr__`, operator overloading basics

## Advanced (Day 31–45)

- **Day 31 – Iterators and Generators:** `__iter__`, `__next__`, `yield`
- **Day 32 – Decorators:** function wrappers, practical decorators
- **Day 33 – Closures:** inner functions, lexical scope examples

- **Day 34 – Regular Expressions:** `re` module basics and examples
- **Day 35 – JSON Handling:** `json` module, load/dump, APIs
- **Day 36 – Date and Time:** `datetime` module usage and formatting
- **Day 37 – Advanced File Handling:** binary files, CSV handling (`csv` module)
- **Day 38 – Packages & pip:** creating packages, virtualenv/venv basics, pip install
- **Day 39 – NumPy Basics:** arrays, vectorized operations (intro)
- **Day 40 – Pandas Basics:** Series, DataFrame, `read_csv`, basic operations
- **Day 41 – Matplotlib Basics:** simple plots, save figures
- **Day 42 – Seaborn Basics:** statistical plots and styling
- **Day 43 – Web Scraping (BeautifulSoup):** parsing HTML, extracting data
- **Day 44 – Web Scraping (Requests):** request/response handling, headers, status codes
- **Day 45 – API Requests:** REST APIs, `requests` library, GET/POST examples

## Projects & Portfolio (Day 46–60)

- **Day 46 – JSON & API Handling:** advanced parsing + combining API data
- **Day 47 – Advanced Projects Prep:** plan projects, define features & datasets
- **Day 48 – Mini Project: Weather App:** fetch API data, parse & display
- **Day 49 – Mini Project: Quiz App:** CLI or simple GUI quiz
- **Day 50 – Mini Project: ToDo App:** file or simple DB persistence
- **Day 51 – Mini Project: Notes App:** add/search/delete notes, save to JSON
- **Day 52 – Mini Project: Advanced Calculator:** extend earlier calculator with history
- **Day 53 – Mini Project: Quote Generator:** random quotes, API integration
- **Day 54 – Mini Project: Currency Converter:** use exchange rate API
- **Day 55 – Mini Project: Weather Dashboard:** aggregate multiple APIs / visualization
- **Day 56 – Projects Review:** polish, refactor, document code
- **Day 57 – Revision:** revisit tough topics, add tests or edge-case handling
- **Day 58 – Full Portfolio Prep:** create portfolio README, screenshots, demo instructions
- **Day 59 – Final Projects:** finalize and clean up final projects
- **Day 60 – Journey Wrap-Up:** summary, learnings, next steps, share on LinkedIn

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## How to Use This Repository

Follow these steps to get started quickly:

### 1. Clone the repository

```
git clone https://github.com/yourusername/Python-60Day-Challenges.git
```