

I'll restructure the Python learning plan for 14 days with 1.5 hours daily, focusing on practical applications and micro-topics.

Day 1: Advanced Data Structures

Time Split:

- 20 min: Concept review
- 40 min: Coding practice
- 30 min: Mini-project

Micro Topics:

1. Lists & Tuples

- List slicing techniques
- Memory views
- Tuple as dictionary keys
- Packing/unpacking
- List internals

2. Dictionaries

- Dictionary views
- Dictionary merging
- defaultdict patterns
- OrderedDict vs dict
- Dictionary comprehension tricks

Practice Project: Build a caching system with LRU implementation

Day 2: Collections Module Deep Dive

Micro Topics:

1. Counter class

- Most common elements
- Element arithmetic
- Counter updating
- Subtraction patterns

2. deque operations

- Rotation methods
- Bounded vs unbounded
- Thread-safe operations
- Performance optimization

Practice Project: Build a log processor with rotating buffer

Day 3: Comprehensions & Generators

Micro Topics:

1. Comprehensions

- Nested comprehensions
- Set/dict comprehensions
- Filter patterns
- Error handling
- Performance implications

2. Generator Expressions

- Memory efficiency
- Chaining generators
- send() protocol
- Closing generators
- Exception handling

Practice Project: Create a memory-efficient data pipeline

Day 4: Decorators & Closures

Micro Topics:

1. Decorator Patterns

- Function decorators
- Class decorators
- Method decorators
- Parametrized decorators
- Stacking decorators

2. Closure Implementation

- Nonlocal variables
- Cell objects
- Binding behavior
- Memory patterns

Practice Project: Build an authentication decorator system

Day 5: Advanced Functions

Micro Topics:

1. Function Objects

- Attributes
- Annotations
- Callable types
- Partial functions
- Function factories

2. Parameter Handling

- Keyword-only args
- Positional-only args
- Variable arguments
- Default mutable arguments
- Type hints in functions

Practice Project: Create a command pattern implementation

Day 6: Context Managers

Micro Topics:

1. Context Protocol

- **enter/exit**
- Exception handling
- Reentrant contexts
- Async contexts

2. contextlib

- @contextmanager
- ExitStack
- suppress
- closing

Practice Project: Resource management system

Day 7: Advanced OOP - Part 1

Micro Topics:

1. Class Mechanics

- Method resolution order
- Super() patterns
- Multiple inheritance
- Abstract methods
- Interface patterns

2. Special Methods

- Comparison methods
- Container methods
- Attribute access
- String representation

Practice Project: Build a custom container type

Day 8: Advanced OOP - Part 2

Micro Topics:

1. Descriptors

- Property implementation
- Lazy properties
- Computed attributes
- Validation descriptors

2. Metaclasses

- Class creation
- Attribute initialization
- Class registration
- Abstract base classes

Practice Project: Create an attribute validation system

Day 9: Error Handling Advanced

Micro Topics:

1. Exception Patterns

- Custom exceptions
- Exception chaining
- Context managers
- Cleanup patterns

2. Debugging

- pdb usage
- Logging patterns
- Stack trace analysis
- Debug decorators

Practice Project: Build an error reporting system

Day 10: Concurrency Basics

Micro Topics:

1. Threading

- Thread lifecycle
- Daemon threads
- Thread pools
- Race conditions

2. Synchronization

- Locks
- Events
- Semaphores
- Conditions

Practice Project: Multi-threaded download manager

Day 11: Advanced Concurrency

Micro Topics:

1. AsyncIO

- Event loops
- Coroutines
- Task scheduling
- AsyncIO patterns

2. Multiprocessing

- Process pools
- Shared memory
- Pipes vs Queues
- Process synchronization

Practice Project: Async web scraper

Day 12: File Operations

Micro Topics:

1. File Handling

- Binary files
- Memory mapping
- File locking
- Temporary files

2. Pathlib

- Path operations
- Glob patterns

- File monitoring
- Path protocols

Practice Project: File system monitor

Day 13: Data Processing

Micro Topics:

1. CSV/JSON/XML

- Custom parsers
- Schema validation
- Streaming parsers
- Data transformation

2. Serialization

- Pickle protocol
- Custom serializers
- Security considerations
- Performance optimization

Practice Project: Data format converter

Day 14: Testing & Documentation

Micro Topics:

1. Testing

- Pytest fixtures
- Mocking
- Parametrization
- Coverage analysis

2. Documentation

- Docstring formats
- Type hints
- API documentation
- Documentation testing

Practice Project: Create a test suite with documentation

Daily Practice Structure (1.5 hours):

1. 20 min: Quick theory and examples
2. 40 min: Hands-on coding exercises

3. 30 min: Project work