



Course Outline
Basic Python Development

Basic Python Training Content	Lectures	Exercises	
Introduction to Python	2		2
Python syntax, controlling flow of execution	1	3	4
Lists and loops	1	3	4
Functions in Python	2	8	10
Advanced lists and loops, recursion	2	8	10
List and String operations, Data structures	2	8	10
Advanced lists, advanced command line execution	1	3	4
Zip, modules, files	2	2	4
Working with files	2	4	6
Python Containers	2	4	6
Object-oriented programming	4	8	12
Python real-life problems	1	3	4
Advanced OOP concepts	1	3	4
TOTAL	23	57	80
End of course			Final Exam

Introduction to Python

- What is programming?
- What is Python?
- Compilers vs. Interpreters
- Python 2 vs. Python 3
- Installing Python
- Environment variables
- Programming software versioning
- Command prompt / terminal
- Basic commands for CMD / terminal
- Python IDLE
- Getting help
- Print function
- Comments
- Input function
- Print function
- Text to numeric conversion

6 assignments



Python syntax, controlling flow of execution

- IDLE vs command line runs
- Variables
- Reserved keywords
- Case sensitivity
- Different ways of printing (comma, format, f-string)
- Data types
- Casting
- Arithmetic operations
- Comparison operators
- Logic operators
- Flow control: if, else, else if
- Indenting requirements

11 assignments

Lists and loops

- Lists
- Understanding indexing
- Understanding slicing
- For loop
- While loop
- Tips and tricks

15 assignments

Lists and loops

- For vs. While loop
- Disadvantages of while loop
- When to use while loop

10 assignments

Functions in Python

- Online interpreters
- What are functions?
- Why do we use functions?
- Required parameters
- Optional parameters
- len function

12 assignments

Functions in Python

5 assignments



Advanced lists and loops, recursion

- Sorting
- list.sort vs. sorted
- What are inplace methods?
- Programming concept: Coding schemas
- ASCII, Unicode, UTF-8
- Else for For loop
- List comprehensions
- Recursion

9 assignments

Recursion

7 assignments

List and String operations, Data structures

- Complete walkthrough of list operations
- Common pitfall: List copying
- Normal copy (assignment)
- Shallow copy
- Deep copy
- Complete walkthrough of string operations
- Variable scope for list comprehensions
- Programming concepts: Algorithms
- Programming concepts: Data structures
- Data structure: Stack
- Data structure: Queue

1 common interview assignment

Advanced lists, Advanced command line execution

- Slice objects
- Common pitfall: Lists as optional parameters
- Lists within lists (matrices)
- Command line arguments

7 assignments

Zip, modules, files

- Zip
- Modules
- Files
- Checking if file exists
- If name == "main"

10 assignments



Working with files

- With context manager
- Standard error output
- Reading small files
- Reading files line by line
- Seek
- Tell

10 assignments

Python Containers

- Tuple
- Tuple vs. List
- Mutable vs. Immutable
- Sets
- Dictionaries
- Data structure: Hash maps
- Algorithms: Hash maps
- Interview questions: Hash maps

3 assignments

Object-oriented programming

- History of OOP
- OOP concepts: Attributes
- Python class attributes
- OOP concepts: Methods
- OOP concepts: Encapsulation
- Getters and Setters
- str

3 assignments

Object-oriented programming

- Dunder methods
- repr vs. str
- Docstrings
- Destructors
- OOP concepts: Inheritance
- OOP concepts: Polymorphism
- Polymorphism in Python

3 assignments

Python real-life problems

- PyPi
- pip
- Virtual environments
- Conda in detail
- requirements.txt



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- Modules
- sys.path
- .pyc files
- dir function

6 assignments

7

Advanced OOP concepts

- Static methods
- Class methods
- Multiprocessing
- Multithreading

1 assignment

Practice for Final exam