

Course Name	Python Fundamentals for MLOps
Course Duration	2 Day (16 hours)
Target Audience	DevOps Engineer, MLOps Enthusiasts, Developers, Data Scientists
Course Outcomes	Understand Python data types and data structures.
	Use functions, classes, and modules in Python.
	Write and execute tests in Python.
	Analyze and manipulate data using Pandas and Numpy.
	Build machine learning applications using Python libraries and tools.

Module 01: Introduction to Python	
1.1	Working with Variables & Types
	Variables and Assignments
	Working with Different Data Types
	Conditionals and Evaluations
	Catching and Handling Exceptions
	Exercises: Variables and Types
1.2	Introduction to Python Data Structures
	Introduction to Lists
	Creating and Iterating Over Lists
	Introduction to Dictionaries
	Creating and Iterating Over Dictionaries
	Other Data Structures: Tuples and Sets
	Exercises: Data Structures
1.3	Adding & Extracting Data from Data Structures
	Adding Data to Lists
	Extracting Data from Lists
	Extracting Data from Dictionaries
	Exercises: Adding and Extracting Data
Module 02: Python Functions & Classes	
2.1	Working with Functions
	Function Structure and Values
	Function Arguments
	Variable and Keyword Arguments
	Exercises: Functions
2.2	Python Functions & Classes
	Introduction to Classes
	Using a Constructor

	Adding Methods
	Class Inheritance
	Exercises: Python Classes
2.3	Modules & its Advanced usage
	Introduction to Python Modules
	Working with Imports
	Working with Python Scripts
	Virtual Environments and Dependencies
	Lesson Recap: Modules and Advanced Usages
	Exercises: Python Modules
Module 03: Testing in Python	
3.1	Introduction to Testing
	Writing and Executing Tests
	Motivations for Testing in Python
	Testing Conventions
	Testing with pytest
	Exercises: Testing Conventions
3.2	Writing Useful Test
	Using Plan Asserts in pytest
	Writing Test Classes
	Test Classes vs. Test Functions
	Parameterizing Tests
	Exercises: Testing with Pytest
3.3	Testing Failures
	Test Failure Output
	Python Debugging with PDB
	Other pytest Runner Options
	pytest Fixtures
	Exercises: Test Failures
Module 04: Introduction to Pandas & NumPy	
4.1	Basic Pandas Usage
	Loading Data into Pandas
	Writing Data from Pandas DataFrames
	Exploratory Analysis with Pandas
	Lesson Recap: Basic Pandas Usage
	Exercises: Introduction to Pandas
4.2	Working with DataFrames
	Common DataFrame Operations
	Manipulating Text in DataFrames
	Applying Functions with Pandas
	Visualizing Data with Pandas

	Lesson Recap: Working with DataFrames
	Exercises: Pandas DataFrames
4.3	Numpy Basics
	Introduction to NumPy Arrays
	Common NumPy Array Operations
	More NumPy Array Operations
	Lesson Recap: NumPy Basics
	Exercises: NumPy
Module 05: Applied Python for MLOps	
5.1	Working with APIs & SDKs
	Installing Azure Command-Line Interface (CLI)
	AzureML Studio with Python (only for demonstration purpose)
	Hugging Face Transformers
	Hugging Face Datasets
	Azure Open Datasets (only for demonstration purpose)
5.2	Automation with Command Line Tools
	Creating a Single File Script
	Using the ArgParse Framework
	Declaring Dependencies
	using the Click Framework
	Packaging your Project
	Demo: Solving a Machine Learning Problem with a CLI Tool
5.3	Building with Machine Learning APIs
	Introduction to Flask Framework
	Building an API with Flask
	Introduction to the FastAPI Framework
	Building an API with FastAPI
	Python API Best Practices
	Demo/Exercises: MLOps CLI (optional)