# Python Foundations Training

Duration: **3 Day**

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## Overview

**Exclusive - Learn how to write programs in Python in this comprehensive and very hands-on 3-day course.**

Working within an engaging, hands-on learning environment, and guided by an expert instructor, this 3-day course is designed for students of any background looking to get started with Python programming, learn core Python programming concepts, and write effective Python code using the latest features and techniques. It's also suitable for existing programmers and developers with an interest in RPA/AI development, or data science related development with Python as the main scripting language. Other appropriate job roles include:

- System Administrators
- Network Administrators and Engineers
- DevOps Engineers
- Back-end developers
- Front-end developers

**Is This The Right Course?**

A basic familiarity with any programming or scripting language is helpful, but not essential.

**Who Should Attend?**

This course is an appropriate introduction to students of any background looking to get started with Python core concepts and learn fundamental programming.
Programmers/Developers who aspire to shift their career towards RPA/AI development, Data Science related project development that majorly uses Python as the scripting language

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## Prerequisites

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## What You Will Learn

Working within an engaging, hands-on learning environment, and guided by an expert instructor, students will learn to write effective Python code using the latest features and techniques, including:

- Create working Python scripts following best practices
- Explore simple and complex Python data types and use them appropriately
- Use built-in functions and create custom functions with parameters and return types
- Understand Pythonic features such as comprehensions and iterators
- Work with dates, times, and calendars
- Read and write files with both text and binary data
- Gain familiarity with the standard library and its work-saving modules
- Understand objects in Python and how to create classes

## Outline

**DAY 1: GETTING STARTED WITH PYTHON PROGRAMMING**

1. Python Variables and Data types
    - Python intro with a quick overview on the syntax, IDEs
    - Recall how to declare/initialize variables of different data types in Python - Numeric, String, Bool, Sequence
    - Naming Conventions & Rules
    - Functions and purpose of main()
    - Arguments
    - Command line parameters
    - White spacing basic rules
    - Types as Objects
    - Type conversion
    - Mutable vs Immutable Objects
2. Working with Strings in Python
    - String Literal - Escape Sequences
    - Formatting String Output
    - Printing and formatting strings
    - Scripting with input()
    - About raw_input()
3. Working with Dates and times
    - Working with dates and times
    - Translating timestamps
    - Parsing dates from text
    - Formatting dates
    - Calendar data
4. Working with Conditional Statements and Loops
    - If else statements
    - If elif
    - Nested if statement
    - While usage
    - Count and Event controlled loop
    - Continue and Break
    - For iteration examples

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5. Objects
    - Overview of objects
    - Creating objects and defining objects
    - Working with objects
6. Basic error handling
    - Different errors
    - Handling errors
    - Best practices

**DAY 2: COMPLEX DATA TYPES IN PYTHON**

1. Lists & Tuples
    - Lists
    - Mixed Lists
    - Common List Methods
    - Other List Operations – CRUD operations
    - Working with Tuples
    - Immutable Tuples
    - Indexing and Slicing
    - Shallow and deep copies of List and tuples
    - Lists vs Tuples
2. Dictionaries and Sets
    - An overview and construction of dictionaries
    - Keys and Values
    - Dictionary Methods
    - About sets
    - Creating sets
    - Working with sets
    - Dictionaries vs Lists vs Tuples vs Sets
3. Understanding Iterators
    - The range() function
    - Taking the range() of len()
    - Iterative Objects
    - The iter() Function
    - Iterating through a sequence
    - Nested sequences
    - Sequence functions, keywords, and operators
    - Looping across data sets
    - Iterating through lists
    - Looping across lists of lists
    - Looping with dictionaries
    - Looping across lists of dictionaries
4. Sorting
    - The sorted() function
    - Alternate keys
    - Sorting collections
    - Using operator.itemgetter()
    - Reverse sorting
5. Basic File operations in Python
    - Opening files
    - Read data from files
    - Write data to files

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- Reading and writing raw (binary) data

**DAY 3: PYTHON MODULAR PROGRAMMING**

1. Python Functions
   - Defining functions
   - Parameters
   - Returning values
   - Nested Functions
   - Variable Masking
   - Preventing Variable Modifications
   - Argument Matching Methods
   - Basic List Comprehensions
   - Variable scope - local, global, nested
2. Modules & Packages
   - Module Basics
   - Packages
   - Pip and pip3
   - Virtual environments
   - Defined modules
   - Import modules
   - From import statements
   - Some useful modules to know
   - Functions and module aliases
3. The standard library
   - The sys module
   - Launching external programs
   - Math functions
   - Random numbers
   - Reading CSV data
4. Classes in Python
   - About OOP
   - Defining a class
   - Constructor
   - Classes instantiation
   - Class variables and methods
   - Instance variables
   - Properties – getters and setters
   - Subclasses (Inheritance)
   - Multiple Inheritance
   - Static methods