

# Python & C++: Fundamentals & Hands-On Programming

Learn the fundamentals of Python and C++, from syntax and control flow to functions, pointers and classes.

**3**

MODULES

**14**

TOPICS

**4**

HANDS-ON ACTIVITIES

## COURSE OVERVIEW

This course introduces Python and C++, outlining their strengths, use cases and industry applications. It covers Python basics including syntax, dynamic typing, variables, data types, control flow and functions, applied through hands-on exercises such as recursion and list or dictionary manipulation. It then covers C++ essentials, including static typing, memory management, variables, data types, control structures, functions and pointers, reinforced with exercises on sorting arrays and implementing classes with constructors and methods.

## WHO THIS COURSE IS FOR

Python Developers

C++ Developers

Software Engineers

Programming Beginners

Data Science Practitioners

## LEARNING OBJECTIVES

- Describe the strengths and use cases of Python and C++
- Explain Python syntax and dynamic typing
- Apply control flow using if, else, for and while loops in Python
- Define and call functions in Python
- Explain static typing and memory management in C++
- Apply control structures such as if, switch and loops in C++
- Implement functions and pointers in C++
- Develop a simple class with a constructor and methods

# 3 Modules, 14 Topics

01

15 minutes

## Introduction

### OBJECTIVE: SET THE STAGE AND INTRODUCE THE LANGUAGES

- Brief on Python, C++: strengths, use cases, and industries
- Workshop goals and agenda

02

2 hours

2 Activities

## Python Basics

### TOPICS

- **Objective:** Cover Python's simplicity and use for rapid development

### KEY FEATURES OF PYTHON (30 MINUTES)

- Syntax overview and dynamic typing
- **Use cases:** Data Science, Web Development, Scripting

### HANDS-ON: PYTHON FUNDAMENTALS (60 MINUTES)

- Variables, data types, and operators
- **Control flow:** if, else, for, and while loops
- **Functions:** Defining and calling

03

2 hours

2 Activities

## C++ Essentials

### TOPICS

- **Objective:** Introduce C++'s speed and system-level programming power

### KEY FEATURES OF C++ (30 MINUTES)

- Static typing and memory management
- **Use cases:** Game Development, Embedded Systems, High-Performance Apps

### HANDS-ON: C++ FUNDAMENTALS (60 MINUTES)

- Variables, data types, and operators
- **Control structures:** if, switch, loops (for, while)
- Functions and pointers

## Practise What You Learn

| #  | MODULE         | ACTIVITY                                                                                                                                                                        |
|----|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 02 | Python Basics  | <ul style="list-style-type: none"><li>■ Write a Python program to calculate factorial using recursion</li><li>■ Solve basic list and dictionary manipulation problems</li></ul> |
| 03 | C++ Essentials | <ul style="list-style-type: none"><li>■ Write a program to sort an array using selection sort</li><li>■ Implement a simple class with a constructor and methods</li></ul>       |

## WHAT IS INCLUDED

## Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

## ABOUT KOENIG

## Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

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