Programming Essentials in Python

American International University Bangladesh
Praesidium Disciplina Civitatis 1994
institute of continuing education
PYTHON INSTITUTE
Open Education & Development Group

Course Outline

Programming Essentials in Python develops foundational knowledge and programming skills necessary for web development, data analysis, IoT and more. Career pathways include application development, business analytics, IoT data analyst, software development.

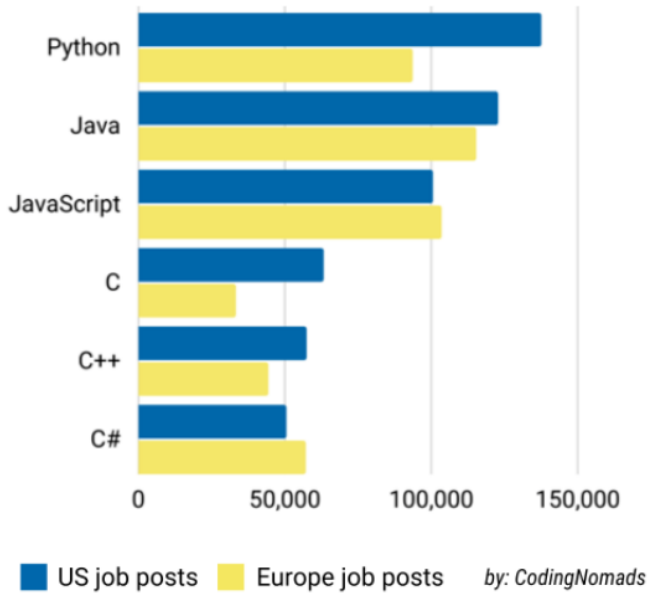
Estimated Time to Completion: 70 Hours
Course Delivery: Instructor-led, Online or On-Campus
Learning Components:

- 8 Modules, 35 Lab Exercises to reinforce learning
- 8 Quizzes and Chapter Assessments
- Pre-final and Final Test

Course Recognitions: Certificate of Completion, Verifiable Digital Badge, Certification Exam Discount Voucher

Introduction

Python is the most growing and most sought-after general-purpose programming language used to build just about anything. Python is key for backend web development, data analysis, artificial intelligence, and scientific computing, all of which are key for pursuing IT careers. The more you understand Python, the more you can do in the 21st Century. Currently, there are 100,000+ unfulfilled Python jobs around the world, and the supply of qualified Python programmers is unable to match the demand.



Most in-demand programming languages 2021-2022

With *Programming Essentials in Python*, you learn to design, write, debug, and run programs encoded in the Python language. No prior programming knowledge is required. The course begins with the very basics guiding you step by step until you become adept at solving more complex problems. This course has been reviewed and approved by the Python Institute.

Target Audience

This course is designed for Beginner and Intermediate level python developers.

Prerequisites

The curriculum is designed for upper secondary schools, technical schools, and colleges or universities. No pre-requisites for students.

Target Certification

This course is divided into 2 parts.

Python Essentials Part 1 (PE1) is aligned with *PCEP – Certified Entry-Level Python Programmer* certification (Exam PCEP-30-0x) which is a professional credential that measures the candidate's ability to accomplish coding tasks related to the essentials of programming in the Python language.

Python Essentials Part 2 (PE2) is aligned with *PCAP – Certified Associate in Python Programming* certification (Exam PCAP-31-0x) which is a professional, high-stakes credential that measures the candidate's ability to perform intermediate-level coding tasks in the Python language.

Course Objectives

By the end of the course, students will be able to:

- Develop a working knowledge for how computers operate and how computer programs are executed.
- Evolve critical thinking and problem-solving skills using an algorithmic approach.
- Learn about the programmer's role in the software development process.
- Translate real-world issues into computer-solvable problems.

Lab Equipment Requirements

This course requires no physical equipment other than the student's lab PC with a decent hardware configuration and reliable internet connection.

Course Outline

Python Essentials Part 1 (PE1)	
Modules	**Objectives**
Introduction to Python and Computer Programming	Python as a modern, universal, and growing programming language
	Python versions and language development
	Brief review of tools and environments needed to start programming in Python
Data Types, Variables, Basic Input Output Operations, Basic Operators	How to write and run the very first Python program
	Python literals
	Python operators and expressions
	Variables naming and using
	Basic input/output operations in Python
Boolean Values, Conditional Execution, Loops, Lists and List Processing, Logic, and Bitwise Operations	Boolean data type
	Relational operators in Python
	Decision making in Python: if, if else, etc.
	Repeating code execution using loops: while and for Logic and bitwise operations in Python
	Lists: constructing, indexing, slicing and content manipulation
	How to sort a list using a bubble sort algorithm
	Multidimensional lists and their applications
Functions, Tuples, Dictionaries, and Data Processing	Code structuring and the concept of functions
	Function invocation and returning a result from a function
	Name scopes and variable shadowing
	Tuple's purpose, constructing and using
	Dictionary's purpose, constructing and using

Python Essentials Part 2 (PE2)	
Modules	**Objectives**
Modules, Packages, and PIP	What is a module and why do we need it?
	Importing and using modules
	Review of some useful Python modules
	What is a package and how does it differ from a module?
	Constructing and using packages
	PIP the Swiss army knife for package maintenance
Exceptions, Strings, String and List Methods	Characters, strings and coding standards
	Strings vs. lists similarities and differences
	List methods
	String methods
	Python's way of handling runtime errors
	Controlling the flow of errors using try and except
	Hierarchy of exceptions
Object Oriented Programming	Basic concepts of object programming
	From procedural to object approach motivations and profits
	Classes, objects, properties, and methods
	Inheritance and polymorphism
	Exception as an object
Miscellaneous	Generators, iterators, and closures
	Working with filesystem, directory trees and files
	Selected Python Standard Library modules