Python Programming Certificate

Python is one of today's most popular and fast-growing programming languages, with applications in data science, software development, machine learning, and AI.

This certificate program follows a rigorous, user-centric approach to software engineering with Python. Its goal is not simply to teach you how to use Python, but rather to understand the core principles of Python and develop the ability to become a proficient Python programmer and software developer. You will design, code, test, visualize, analyze, and debug Python functions and programs. You will also be provided a robust set of tools to assist you in your coursework.

Additionally, the program includes two project-based courses that provide the opportunity to take the concepts you learn in programming and apply them by designing Python-based solutions to real-world business problems.

Ultimately, you'll come away with not only the technical skills to grow in the field of computer science, but the problem-solving ability and creativity that companies are increasingly looking for.

You will be most successful in this program if you are comfortable with pre-calculus, basic algebra, trying new things and troubleshooting with your computer. You will also be expected to download and install Anaconda and Atom in the first course.

Inside the Program

- Certificate consists of 6 three-week courses
- Courses include multiple choice quizzes, instructor-moderated discussions, and a final project to practice what you've learned in real-world context
- Opportunities for collaboration and networking with fellow students both during and after your courses
- Course materials available 24/7 during the course and 1 additional week to review the content
- Plan to spend 8-12 hours per week on each course

What You'll Learn

- Master programming concepts in Python
- Use procedural Python statements such as assignments, functional calls, and control structures
- Organize your code so that you can work in teams
- Specify your requirements and avoid ambiguity
- Design, code, and test Python functions that meet requirements
- Visualize, analyze, and debug running Python programs
- Develop and deploy self-contained Python packages
- Professionally test and verify your code

Who Should Enroll

- Current and aspiring programmers, software developers, and engineers
- Current and aspiring web developers
- Computer and data scientists
- Scientists interested in learning programming

What You'll Earn

- Python Programming Certificate from Cornell Computing and Information Science
- 144 Professional Development Hours (14.4 CEUs)

Python Programming Certificate Courses

Python Fundamentals (CIS551)

This course provides an introduction to the programming environment and explores the basics of Python. After learning how to run a script, you will work with Python expressions, functions, and variables in interactive mode. By the end of the course, you will be able to write a basic Python script that includes built-in functions and modules.

User-Defined Functions in Python (CIS552)

This course explores Python functions. As you expand your technical vocabulary, you will practice visualizing Python executions. In addition, you will examine the rules for writing functions and recognize a properly formatted specification. You will explore writing simple functions to process text and be able to turn an English description into code. You will also practice testing and debugging code and learn how to interpret error messages.

Developing a Currency Converter (CIS553)

You will take the concepts you have learned up to this point and use them in a real-world application, creating a program that can convert amounts of currency. You will define and design your own functions, design an interactive script, and test these functions and script in the development of a currency converter. You will also explore how Python can be used to work with web services.

This course serves as a capstone experience to the first two courses of the program.

Controlling Program Flow (CIS554)

This course shows you how to move beyond straight line code and write programs that require complex decisions. These might occur within a business workflow or a compex scientific computation. You will write conditional, try-except, for-loop, and while-loop statements, as well as use them to design functions. You will also explore recursion, including how to design, divide, and conquer algorithms.

Mastering Data Structures (CIS555)

This course introduces you to mutable data structures, which are advanced Python types that enable faster updating and search than basic types like ints and strings. These types are necessary for working with large data sets but can be difficult to master. You will explore multiple methods to work with these objects, which include lists, sets, and dictionaries. You will also write expressions and employ extensive use of visualization.

Auditing Datasets (CIS556)

You will begin by examining several types of files and objects. You will then apply the concepts you have learned in the previous courses to solve a real-world business problem: auditing an organization's regulatory compliance. Working with heterogeneous data, you will first read a series of disparate data files and determine how to integrate the data. You will then write a sequence of scripts that pull information from these files and inform the user on whether the organization has fully complied with regulations.

This course serves as a capstone experience to the program.