PeopleCert Software Development Skills Foundation and Advanced (Python)

Learning Mode:
Physical

Duration:
16 days training

This course is specifically designed to provide participants with:

- **Develop Strong Foundations**: Gain a comprehensive understanding of software design, architectures, development methodologies, and requirements analysis.
- **Programming Proficiency**: Write, debug, and maintain code using Python and supporting languages/tools while applying principles of object-oriented programming and software maintainability.
- **Web & Database Skills**: Build and style interactive front-end applications with HTML, CSS, JavaScript, and connect them with relational databases using SQL and Python frameworks such as Django.
- **Advanced Development Practices**: Apply design patterns, work with algorithms and data structures, and develop secure, scalable web applications using modern frameworks.
- **Software Testing & Debugging**: Apply testing methodologies and tools to ensure high-quality, reliable software solutions.
- **Teamwork & Professional Practice**: Collaborate effectively in Agile/Scrum-based teams, apply DevOps practices, and follow industry standards in documentation, version control, and IT service management.
- **Real-World Readiness**: Design, develop, and deliver full-stack applications, working on larger-scale projects to gain practical experience aligned with industry expectations.

Accredited by:

PeopleCert
All talents, certified.

Course Overview

SUMMARY

The PeopleCert Software Development Skills (Python) program provides a complete pathway from beginner to advanced levels in software development, equipping participants with the skills to thrive as full-stack developers. Python, known for its versatility and simplicity, is used across industries to build websites, applications, automate workflows, and analyze data.

The Foundation level focuses on building strong fundamentals in programming, software design, web development basics, relational databases, and teamwork skills. It is ideal for fresh graduates or early-career professionals who wish to transform academic knowledge into practical business and coding skills.

The Advanced level takes participants deeper into real-world development practices, introducing advanced programming techniques, object-oriented programming, design patterns, REST architecture, JavaScript frameworks (e.g., React, Angular), Agile methodologies, DevOps practices, and advanced database management. Learners gain hands-on experience in large-scale, team-based projects, ensuring they are ready for professional software development roles.

Course Content

MODULE 1 Software Design and Development

- Key Concepts
- Software Architectures
- Software Development Methodologies
- Requirements Capturing and Software Design

MODULE 2 Introduction to Programming

- Developer Tools
- Programming Languages and Paradigms
- Programming Basics

MODULE 3 Object Oriented Programming

- Introduction to Object-Orientation
- Pointers, References
- Object-Oriented Class Design
- Inheritance
- Polymorphism and Multiple Inheritance
- Lifecycle of an Object
- Python Collections Interface
- Object Comparison
- Error Handling
- Connect to a Database
- Algorithms, Data Structures, and Other Topics
- Writing Maintainable Code

MODULE 4 Web Design and Development Fundamentals (Front-End)

- Key Concepts and Principles
- HTML
- Cascading Style Sheets (CSS)
- Bootstrap
- HTML/ CSS Application and Quality Assurance
- JavaScript/ jQuery
- XML
- Advanced Elements
- Web Publishing and Hosting
- APIs

MODULE 5 (Relational) Databases

- Key Terms/Definitions
- Database Design
- SQL
- RDBMS
- Advanced Database Topics

MODULE 6 Web Application Development, MVC and Other Frameworks

- Introduction to Web Development
- Server-Side Code of a Web-Application (e.g., Django (for the Python stream)
- REST Architecture

MODULE 7 Software Testing & Debugging

- Types of Software Testing
- Testing Levels & Debugging Techniques

PeopleCert Software Development Skills Foundation and Advanced (Python)

Course Content

MODULE 8 UI/UX – Usability
- The Design Process
- Rapid Prototype

MODULE 9 Developer Soft Skills and Teamwork
- Interpersonal Skills
- IT Service Management (ITSM)

MODULE 10 Software Design and Development
Software Architectures
- Understand mobile application architectures

Software Development Methodologies
- Understand how code reviews work
- Understand how DevOps works
- Understand how Scrum works

Supporting Activities and Professional Practice
- Understand and use configuration management
- Draft appropriate documentation
- Practice working in an Agile workflow using common tools of the trade to collaborate with each other and document progress

MODULE 11 Introduction to Programming
Developer Tools
- Understand and perform debugging

MODULE 12 Object Oriented Program

Error Handling
- Create and use custom exceptions

Connect to a Database
- Connect to an RDBMS in Java / C# / JavaScript / Python Execute an SQL query and retrieve data in Java / C# / JavaScript / Python
- Consume data in Java / C# / JavaScript / Python

Design Patterns
- Describe design patterns
- Use the Observer software design pattern
- Use the Strategy software design pattern
- Use the Factory software design pattern
- Use the Abstract factory software design pattern
- Use the Composite software design pattern

Algorithms, Data Structures, and Other Topics
- Understand what algorithm development is and develop algorithms Understand Complexity Analysis
- Understand and use Graph Data Structures
- Understand and use Sorting
- Understand and use Searching
- Understand and use Scripting APIs

Writing Maintainable Code
- Describe and apply basic code style guidelines and participate in code review sessions
- Describe and apply software maintainability
- Understand code maintainability and code maintenance
- Work on large projects and use code reading
- Understand Code and Design Smells
- Understand and use web development editors, tools and principles.
- Understand and use basic design elements: design concept, page(s) design, Home page layout, navigation bar

MODULE 13 Web Design and Development Fundamentals (Front-End)
Cascading Style Sheets (CSS)
- Create a Style Sheet using: CSS Properties, CSS Styling (Background, Text Format, Controlling Fonts), block elements and objects, Lists and Tables, CSS Id and Class, Box Model (Introduction, Border properties, Padding Properties, Margin properties)
- Use CSS Advanced techniques and elements like: grouping, dimension, display, positioning, floating, alignment, pseudo class, navigation Bar, image sprites, attribute sector

PeopleCert Software Development Skills Foundation and Advanced (Python)

Course Content

HTML/ CSS Application and Quality Assurance

- Create static pages and know how to implement designs consistent with web standards and best practices
- Use tools to provide feedback on the quality of HTML and CSS to ensure accessibility and accuracy
- Know browsers\' pitfalls and apply/practice techniques to ensure consistency of presentation across different client browsers

JavaScript/ jQuery

- Improve usability of forms, validate data from the user

XML

- Describe and use XML schemas, XSD, XSLT

Advanced Elements

- Understand and use Geolocation, Geolocation API
- Understand use advanced elements like: web storage, Cookies, storage types, methods and properties, events. Distinguish between web storage and Cookies.
- Apply routing behaviours based on URL

Web Publishing and Hosting

- Understand and use virtualization and cloud hosting
- Estimate concurrent users and bandwidth requirements

User Accounts and Security

- Explain user authentication. Hash to keep your user passwords safe and prevent cookie-spoofing
- Describe SQL injection attacks
- Understand symmetric and public key encryption, certificates

MODULE 14 (Relational) Databases
Key Terms/Definitions

- Understand the role of SQL

Database Design

- Understand, define and use data types
- Understand, evaluate and apply database integrity

SQL

- Create and run DELETE SQL queries
- Understand, create and run SQL functions
- Create and run Nested SQL queries

RDBMS

- Import/export data to/from a RDBMS Create indexes
- Understand and use Logging, Recovery, and the Transaction Log
- Understand and use job scheduling
- Understand and use database backup

Advanced Database Topics

- Understand the concept of No-SQL databases like the key-value stores paradigm

MODULE 15 Web Application Development, MVC and Other Frameworks
REST Architecture

- Develop RESTful web services

Server-Side MVC Framework (Spring for Java, ASP.NET for C#, Sails for JavaScript, Django for Python)

- Understand MVC basics and Configuration Packaging
- Understand and use Model
- Understand and use View
- Understand and use Controller
- Understand and use Websockets and Converters

JavaScript (JS) Frameworks

- List common JavaScript (JS) frameworks, like: React, Angular etc. List the benefits of JS frameworks, like: using React eliminates time
- Render with React / Angular
- List and use React / Angular Components
- Differentiate between Props and States in React or Angular
- Compare Imperative to Declarative styles
- Create Forms using React / Angular
- Test React / Angular application

PeopleCert Software Development Skills Foundation and Advanced (Python)

Course Content

- Understand and use React / Angular Compound Components
- Understand and use Animation in React / Angular

MODULE 16 Software Testing & Debugging
The Testing Cycle & Software Testing Tools:

- List all phases of the testing cycle: Requirement Analysis, Test Planning, Test Development, Test Execution, Test Reporting, Test Results Analysis, Defect Retesting, Regression Testing, Test Closure
- Describe and use Open Source, Free and Commercial software testing tools

Types of Software Testing

- Understand and use Static software testing
- Understand and use Dynamic software testing
- Understand and use Black Box software testing
- Understand and use White Box software testing

Testing Levels & Debugging Techniques

- Use an IDE debugger
- Understand and use Unit Testing
- Understand and use Component Testing
- Understand and use Integration Testing
- Understand and use System Testing
- Understand and use Acceptance Testing
- Understand and use Alpha Testing
- Understand and use Beta Testing

MODULE 17 Developer Soft Skills and Teamwork
Interpersonal Skills

- Understand the importance of Communication skills for developers (towards colleagues, management, supervisors, clients etc.) and apply best practices on any type of communication (written or verbal)

Scrum

- Outline Scrum methodology basics
- List Scrum Roles
- Understand how Scrum Meetings work
- Understand and use Scrum Artifacts
- Scale Scrum

IT Service Management (ITSM)

- Define the concept of IT Service Management

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