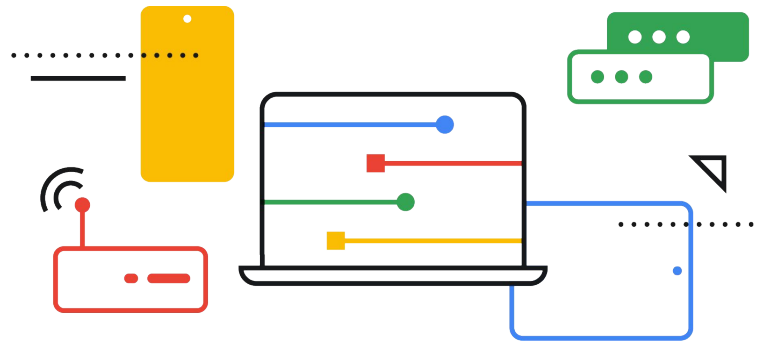


Google IT Automation with Python Certificate



Key Competencies & Job Mapping

Developing talent for in-demand jobs

Nearly two-thirds of all new jobs created since 2010 require either high- or medium-level digital skills,¹ but 1 in 3 American workers have very limited or no digital skills.² To help bridge that gap, we've trained more than 8 million Americans on digital skills to date and invested in building tools and trainings to help create pathways to high-quality jobs.

Google Career Certificates provide job seekers with access to more than 1.5 million in-demand jobs³ across the fields of data analytics, digital marketing & e-commerce, IT support, project management, and user experience (UX) design. These certificates are taught and developed by Google employees working in these fields; they are hands-on, practical, and rigorous. The certificates can be completed in under six months part-time.

GOOGLE IT AUTOMATION WITH PYTHON CERTIFICATE

The Google IT Automation with Python Certificate is designed to help individuals with a background in IT Support advance to technical paths like Systems Administrators. This stackable credential helps IT professionals build in-demand skills including Python, Git, and IT automation.

¹ Brookings, 2017

² National Skills Coalition, 2020

³ Burning Glass Labor Insight: Feb. 1, 2021 - Jan. 31, 2022, U.S.

⁴ Burning Glass Labor Insight, February 1, 2021 - January 31, 2022, U.S.

⁵ Based on program graduate survey responses, United States 2021

400K+

in-demand job
openings in IT ⁴

75%

of program graduates report
an improvement in their
career trajectory (e.g. new job
or career, promotion or raise)
within 6 months of certificate
completion ⁵

THE GOOGLE IT SUPPORT CERTIFICATE PREPARES LEARNERS FOR IN-DEMAND JOBS SUCH AS:

- IT Support II
- Jr Systems Analyst
- Jr Systems Administrator
- Network Specialist

Program Overview

Upon completion of the Google IT Automation with Python, program graduates will:

- Learn how to program with Python with no previous knowledge of coding required and you'll use Python to automate common system administration tasks
- Learn to use Git and GitHub, to troubleshoot and debug complex problems
- Apply automation at scale by using configuration management and the Cloud
- Practice your technical skills with hands-on projects including a capstone project where you'll use your new knowledge to solve a real-world IT problem

This certificate can be completed in about 6 months and is designed to prepare graduates for a variety of roles in IT, like more advanced IT Support Specialist or Junior Systems Administrator positions.



Python



GitHub



Cloud



System administration



Debugging

Course 1

Crash Course on Python

Course 2

Using Python to Interact with the Operating System

Course 3

Introduction to Git and GitHub

Course 4

Troubleshooting and Debugging Techniques

Course 5

Configuration Management and the Cloud

Course 6

Automating Real-World Tasks with Python

CONTENT BREAKDOWN:



333

Videos



135

Readings



70

Quizzes



23

Hands-on labs



9

Programming assignments

Course 1 — Crash Course on Python

This course is designed to teach the foundations needed in order to write simple programs in Python using the most common structures. No previous exposure to programming is needed. By the end of this course, learners will understand the benefits of programming in IT roles; be able to write simple programs using Python; figure out how the building blocks of programming fit together; and combine all of this knowledge to solve a complex programming problem.

By the end of this course, learners will be able to:

- Understand what Python is and why Python is relevant to automation
- Write short Python scripts to perform automated actions
- Understand how to use the basic Python structures: strings, lists, and dictionaries
- Create your own Python objects

SKILLS ACQUIRED:

- ❑ Basic Python Data Structures
- ❑ Fundamental Programming Concepts
- ❑ Basic Python Syntax
- ❑ Python Programming
- ❑ Object-Oriented Programming (OOP)

TOPICS:

- ★ Hello Python!
- ★ Basic Python Syntax
- ★ Loops
- ★ Strings, Lists and Dictionaries
- ★ Object Oriented Programming (Optional)
- ★ Final Project

CONTENT BREAKDOWN:



81

Videos



49

Readings



17

Quizzes



6

Programming assignments

Course 2 — Using Python to Interact with the Operating System

In this course, learners will explore how to execute Python locally, and organize and use code across different Python files. Then, they'll learn how to read and write different types of files, and use subprocesses and input streams. They'll also dive into Bash scripting and regular expressions -- both very powerful tools for anyone working with systems. This course also covers automatic testing, which allows learners to automate how they check if their code is correct. To finish, they'll put all this together by using the tools that they've acquired to process data and generate automatic reports.

This course also explains how to set up a developer environment in a personal machine. This is a key step in being able to write and deploy powerful automation tools.

By the end of this course, learners will be able to:

- Setup, configure, and use your own developer environment in Python
- Manipulate files and processes running on the Operating System using Python
- Understand and use regular expressions (regex), a powerful tool for processing text files
- Know when to choose Bash or Python, and create small scripts using Bash

SKILLS ACQUIRED:

- ❑ Setting up your Development Environment
- ❑ Regular Expression (REGEX)
- ❑ Testing in Python
- ❑ Automating System Administration Tasks with Python
- ❑ Bash Scripting

TOPICS:

- ★ Getting Your Python On
- ★ Managing Files with Python
- ★ Regular Expressions
- ★ Managing Data and Processes
- ★ Testing in Python
- ★ Bash Scripting
- ★ Final Project

CONTENT BREAKDOWN:

	87	Videos
	19	Readings
	16	Quizzes
	7	Hands-on labs
	3	Programming assignments

Course 3 — Introduction to Git and GitHub

In this course, learners will learn how to keep track of the different versions of their code and configuration files using a popular version control system (VCS) called Git. They'll also go through how to setup an account with a service called GitHub so that they can create their very own remote repositories to store their code and configuration.

By the end of this course, learners will be able to:

- Understand why version control is a fundamental tool for coding and collaboration
- Install and run Git on your local machine
- Use and interact with GitHub
- Collaborate with others through remote repositories

SKILLS ACQUIRED:

- ❑ Using Git
- ❑ Version Control Systems
- ❑ Interacting with GitHub
- ❑ Reverting Changes
- ❑ Creating Pull Requests

TOPICS:

- ★ Introduction to Version Control
- ★ Using Git Locally
- ★ Working with Remotes
- ★ Collaboration

CONTENT BREAKDOWN:



57

Videos



15

Readings



12

Quizzes



4

Hands-on labs

Course 4 — Troubleshooting and Debugging Techniques

In this course, we'll give learners the tools to quickly identify and solve real-world problems that they might come across in their IT role. We'll look at a bunch of different strategies and approaches for tackling the most common pitfalls of code and IT infrastructure. We'll cover strategies for approaching almost any technical problem and then see how those apply to solving different real-world scenarios.

By the end of this course, learners will be able to:

- Analyze real-world IT problems and implement the appropriate strategies to solve those problems
- Demonstrate techniques to quickly find and solve the root cause of problems in IT infrastructure
- Understand the root cause for problems related to speed, crashes, or exhausted resources in your computer
- Identify the most common pitfalls of your code and how to fix them

SKILLS ACQUIRED:

- ❑ Improving Software Performance
- ❑ Managing Scarce Resources
- ❑ Advanced Troubleshooting
- ❑ Understanding Errors
- ❑ Finding the Root Cause of a Problem

TOPICS:

- ★ Troubleshooting Concepts
- ★ Slowness
- ★ Crashing Programs
- ★ Managing Resources

CONTENT BREAKDOWN:

	59	Videos
	11	Readings
	12	Quizzes
	4	Hands-on labs

Course 5 — Configuration Management and the Cloud

In this course, we'll cover how to apply automation to manage fleets of computers. Learners will understand how to automate the process for deploying new computers, keeping those machines updated, managing large-scale changes, and a lot more. We'll also discuss managing both physical machines running in our offices and virtual machines running in the Cloud.

By the end of this course, learners will be able to:

- Understand the benefits of configuration management and infrastructure as code
- Manage a fleet of computers using Puppet
- Automatically deploy new virtual machines running in the Cloud
- Deploy changes in a safe manner

SKILLS ACQUIRED:

- ❑ Automation at Scale
- ❑ Configuration Management
- ❑ Basic Monitoring & Alerting
- ❑ Cloud Computing
- ❑ Using Puppet

TOPICS:

- ★ Automating with Configuration Management
- ★ Deploying Puppet
- ★ Automation in the Cloud
- ★ Managing Cloud Instances at Scale

CONTENT BREAKDOWN:



48

Videos



12

Readings



12

Quizzes



4

Hands-on labs

Course 6 — Automating Real-World Tasks with Python

In the final course, we'll tie together the concepts that we've covered up until now. Learners will tackle real-world scenarios in Qwiklabs that will challenge them to use multiple skills at once.

By the end of this course, learners will be able to:

- Use Python external libraries to create and modify documents, images, and messages
- Understand and use Application Programming Interfaces (APIs) to interact with web services
- Understand and use data serialization to send messages between running programs
- Build a solution using the skills you have learned

SKILLS ACQUIRED:

- ❑ Serialization
- ❑ Building a Solution
- ❑ Creating and Translating Media Files
- ❑ Interacting with Web Services

TOPICS:

- ★ Manipulating Images
- ★ Interacting with Web Services
- ★ Automatic Output Generation
- ★ Putting It All Together

CONTENT BREAKDOWN:



1

Video



29

Readings



4

Hands-on labs