

# Programming for Network Engineers (PRNE) v2.0

## What you'll learn in this course

The **Programming for Network Engineers (PRNE) v2.0** course is designed to equip you with fundamental skills in Python programming. Through a combination of lectures and lab experience in simulated network environments, you will learn to use Python basics to create useful and practical scripts with Netmiko to retrieve data and configure network devices. Upon completion of this course, you should have a basic understanding of Python, including the knowledge to create, apply, and troubleshoot simple network automation scripts.

## Course duration

- Instructor-led training: 4 days of in-class learning and lab experience
- E-learning: Equivalent of 4 days of learning and lab experience

## How you'll benefit

This course will help you:

- Explain the need for network engineers to learn how to program
- Explain how programming relates to the journey into network automation and programmability
- Create useful and practical scripts to retrieve data and configure network devices
- Create, apply, and troubleshoot simple network automation scripts
- Gain hands-on experience with Python programming

## Who should enroll

This course is intended for:

- Network administrators
- Network engineers with little or no programming or Python experience
- Network managers
- Systems engineers

## How to enroll

### Instructor-led training

- Find a class at the [Cisco Learning Locator](#).
- Arrange training at your location through [Cisco Private Group Training](#).

### E-learning

- To buy a single e-learning license, visit the [Cisco Learning Network Store](#).
- For more than one license, or a learning library subscription, contact us at [learning-bdm@cisco.com](mailto:learning-bdm@cisco.com).

## Technology areas

- Network programming
- Python
- Network engineering

## Course details

### Objectives

After taking this course, you should be able to:

- Create a Python script
- Describe data types commonly used in Python coding
- Describe Python strings and their use cases
- Describe Python loops, conditionals, operators, and their purposes and use cases
- Describe Python classes, methods, functions, namespaces, and scopes
- Describe the options for Python data manipulation and storage
- Describe Python modules and packages, their uses, and their benefits
- Explain how to manipulate user input in Python
- Describe error and exception management in Python
- Describe Python code debugging methods

### Prerequisites

Before taking this course, you should have:

- Familiarity with Cisco IOS®-XE software or other Cisco network device configuration and operation skills
- Basic network management knowledge
- Cisco CCNA® certification or equivalent knowledge

The following Cisco course may help you meet these prerequisites:

- **Implementing and Administering Cisco Solutions (CCNA)**

## Outline

- Introducing Programmability and Python for Network Engineers
- Scripting with Python
- Examining Python Data Types
- Manipulating Strings
- Describing Conditionals, Loops, and Operators
- Exploring Classes, Methods, Functions, Namespaces, and Scopes
- Exploring Data Storage Options
- Exploring Python Modules and Packages
- Gathering and Validating User Input
- Analyzing Exceptions and Error Management
- Examining Debugging Methods
- Course Summary

## Lab outline

- Execute Your First Python Program
- Use the Python Interactive Shell
- Explore Foundation Python Data Types
- Explore Complex Python Data Types
- Use Standard String Operations
- Use Basic Pattern Matching
- Reformat MAC Addresses
- Use the if-else Construct
- Use for Loops
- Use while Loops
- Create and Use Functions
- Create and Use Classes
- Use the Python main() Construct
- Traverse the File Structure
- Read Data in Comma-Separated Values (CSV) Format
- Read, Store, and Retrieve Data in XML Format
- Read, Store, and Retrieve Date in JavaScript Object Notation (JSON) Format
- Read, Store, and Retrieve Data in a Raw or Unstructured Format

- Import Modules from the Python Standard Library
- Import External Libraries
- Create a Python Module
- Prompt the User for Input
- Use Command-Line Arguments
- Manage Exceptions with the try-except Structure
- Manage Exceptions with the try-except-finally Structure
- Use Assertions
- Use Simple Debugging Methods
- Use the Python Debugger
- Code a Practical Debugging Script



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