

DEVOPS

INTERMEDIATE

3 DAYS

Python for DevOps and SRE Bootcamp

Build a strong foundation in Python automation for DevOps and SRE workflows, from system checks to resilient API and Kubernetes automation. Learn how to write production-ready scripts with logging, error handling, configuration management, and safe CLI design to support incident response and operational reliability.

Why Python for DevOps and SRE?

Faster automation delivery

Python scripts solve operational gaps quickly without waiting for heavy tooling changes.

Better reliability outcomes

Consistent validation and reporting improves stability and release confidence.

Reduced manual troubleshooting

Automated health checks and diagnostics reduce MTTR during incidents.

Higher engineering productivity

Less firefighting, more time for platform improvement and automation.

Standardized operational tooling

Teams move from ad-hoc scripts to reusable and maintainable automation tools.

What you'll be able to do

- ✓ Use Python confidently for DevOps and SRE automation tasks.
- ✓ Write scripts to automate operational workflows such as system checks, log parsing, service validation, backups, and cleanup jobs.
- ✓ Work with Linux from Python using subprocess, OS utilities, and filesystem libraries.
- ✓ Interact with REST APIs using Python including authentication, pagination, retries, and safe error handling.
- ✓ Work with structured data formats used in DevOps: JSON, YAML, and CSV.
- ✓ Automate cloud and Kubernetes workflows using Python by calling kubectl and parsing outputs.
- ✓ Apply reliable scripting patterns including logging, config-driven scripts, safe exception handling, and timeouts.
- ✓ Build production-ready automation tools with CLI interface, proper logging, exit codes, and retry mechanisms.
- ✓ Design scripts as reusable SRE tools rather than one-off hacks.

Who this is for

- DevOps Engineers
- SRE Engineers
- Cloud Engineers
- Platform Engineers

- Linux Administrators
- Developers who want operational automation skills
- QA Automation Engineers moving into DevOps workflows

Curriculum

01 Python for DevOps and SRE Automation (Foundations)

- Why Python is used in DevOps/SRE (automation speed and ecosystem)
- Python essentials for automation (functions, modules, venv basics)
- Writing safe scripts (inputs, validations, predictable outputs)
- Exit codes and reliability mindset (success vs failure states)
- **Hands-on:** Lab: Build a simple health-check script with structured output and exit codes

02 Automating Operational Workflows (Checks, Backups, Cleanup)

- System checks automation (disk, CPU, memory, processes overview)
- Service validation workflows (HTTP checks, port checks, dependency checks)
- Backup automation patterns (copy, archive, retention basics)
- Cleanup jobs (log rotation concepts, temp file cleanup, stale resources)
- **Hands-on:** Lab: Create an operational workflow script for daily checks + backup + cleanup simulation

03 Linux Automation from Python (subprocess and Filesystem)

- Using subprocess safely (shell=False patterns, capture output)
- Common Linux commands for automation (ps, df, free, systemctl overview)
- Filesystem operations (pathlib, permissions, file discovery)
- Parsing command output and converting to structured JSON
- **Hands-on:** Lab: Build a Linux diagnostics script that runs commands and produces a JSON report

04 Log Parsing and Analysis (Operational Troubleshooting)

- Reading large log files safely (streaming, tail patterns)
- Regex-based parsing and pattern detection
- Aggregating results (error counts, top offenders, timeline concept)
- Writing summary reports and exporting results (CSV/JSON)
- **Hands-on:** Lab: Build a log parser that detects incidents and generates a summary report

05 REST API Automation (Auth, Pagination, Retries, Errors)

- Calling APIs using requests (GET/POST basics)
- Authentication patterns (tokens, headers, basic OAuth concepts)
- Pagination handling (next token, page offsets)
- Retries, timeouts, and safe error handling patterns
- **Hands-on:** Lab: Build an API monitoring script that checks multiple endpoints with retries and structured outputs

06 Working with DevOps Data Formats (JSON, YAML, CSV)

- Reading and writing JSON safely (schema awareness concept)
- Reading and writing YAML for config-driven automation
- CSV handling for reports and exports
- Converting formats (YAML → JSON, JSON → CSV) for pipelines
- **Hands-on:** Lab: Build a config-driven tool that reads YAML config and outputs JSON + CSV reports

07 Kubernetes and Cloud Automation with Python (kubectl Integration)

- Calling kubectl from Python (subprocess patterns)
- Parsing kubectl output (json output and jq-like filtering concepts)
- Automation use cases (pods health, node status, events, deployments)
- Safe cluster automation patterns (read-only checks first)
- **Hands-on:** Lab: Build a Kubernetes status checker that reports unhealthy pods and key failure reasons

08 Reliable Scripting Patterns (Logging, Config, Exceptions, Timeouts)

- Structured logging patterns (timestamps, severity, context fields)
- Config-driven execution (env vars + YAML + CLI flags)
- Exception handling strategy (fail fast vs continue patterns)
- Timeouts and preventing stuck automation runs
- **Hands-on:** Lab: Add logging, config, and timeouts to an existing script and validate reliability

09 Building Production-Ready CLI Tools (Exit Codes, Retries, UX)

- CLI design (subcommands, flags, help text)
- Exit codes aligned to monitoring and CI/CD usage
- Retry mechanisms with backoff and safe defaults
- Packaging automation tools for reuse (basic structure and distribution)
- **Hands-on:** Lab: Build a CLI tool that performs checks and fails with correct exit codes for CI usage

10 Designing Reusable SRE Tools (Not One-Off Scripts)

- Turning scripts into maintainable tools (modules, shared utils)
- Standard output formats and contracts (JSON outputs for automation)
- Testing basics for automation tools (unit tests concept)
- Operational documentation (README + runbook usage examples)
- **Hands-on:** Capstone Workshop: Build a reusable SRE automation toolset with config, CLI, logs, and reports