Open Source Software Development: Linux for Developers (LFD107x)

Start your open source software (OSS) adventure today by learning the key concepts of developing OSS and how to work productively in a Linux environment.

Course Overview

Open source software (OSS) has become dominant in the technology space. Since its launch in 1991, Linux has grown to power virtually all the world's supercomputers, most mobile devices, financial exchanges, space stations, and rovers, and serves as the backbone of the cloud and the internet itself. Companies, organizations, governments and individuals around the world rely on Linux and open source technologies to conduct business and live their lives every single day. At the same time, the demand for Linux and open source talent is as strong as ever, as revealed by the 2021 Open Source Jobs report.

This course will guide developers to understand the 'rules of the road' of creating open source software, either as a newbie or as someone with experience primarily in creating and working with proprietary code.

The first part of LFD107 covers the fundamentals of open source software development: the who (successful projects and communities), what (definition), why (benefits), where (Git), and how (licensing, compliance, collaboration tips, managing diversity, and continuous development & integration).

The second part of this course dives into the world of Linux: what Linux is, its history, how to separate the kernel from the operating system, and making contributions to it. It covers the graphical system interface, as well as working at the command line, and continues to discuss filesystems, major system components, user accounts, and more, to help you get fully oriented to working on a Linux system.

This course will provide you with a strong foundation for working comfortably and productively in open source development communities. By the end of this course, you will have a better understanding of the Linux environment, as well as the methods and tools required to successfully use the Linux environment.

Course Learning Objectives

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

- Understand the key concepts involved in developing open source software (OSS).
- Know best practices for long term sustainability of projects, including how to respect and encourage diversity.
- Understand OSS licensing issues, such as types (restrictive vs permissive), and explain how to choose the right one.
- Have a good understanding of Linux systems and utilities.
- Work comfortably at the command line.

The course surveys how open source software works, including advantages of using it, methods of working in OSS communities, governance models, and licensing choices. It delves into Linux systems, including installation, desktop environments, text editors, important commands and utilities, command shells and scripts, filesystems, and compiling software.

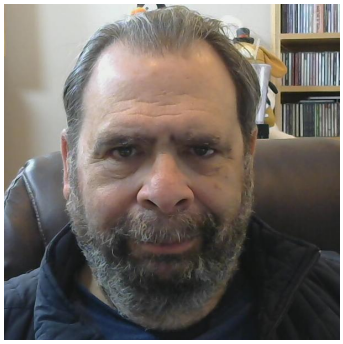
Prerequisites

To make the most of this course, a Linux system is necessary. Either a physical or a virtual machine, and any modern distribution will work. You will need to have experience as a developer on any operating system. You will need some experience in working at the command line is not necessary, but would be helpful.

Audience

This course is addressed to learners who already are experienced computer users on another operating system, but have limited or no experience working in a Linux environment. You are going down this road either because you have to (your employer asked you to, for example); or because you want to (you have heard good things about Linux and want to experience it for yourself).

Course Author



Jerry Cooperstein, Ph.D. has been working with Linux since 1994, developing and delivering training in both the kernel and user space. He has overall responsibility for all training content at The Linux Foundation. During a two-decade career in nuclear astrophysics, he developed state-of-the-art simulation software on many kinds of supercomputers and taught at both the undergraduate and graduate levels. Jerry joined The Linux Foundation in 2009. He is currently working as a Senior Content Manager for the Linux Foundation.

Course Length

- 10-15 hours

Course Outline

Welcome!

- Welcome!

Chapter 1. Introduction to Open Source Software

- Introduction & Learning Objectives
- Open Source Software Overview
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 2. Why Use Open Source Software?

- Introduction & Learning Objectives
- Why Use Open Source Software?
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 3. Examples of Successful OSS Projects

- Introduction & Learning Objectives
- Successful OSS Projects
- Lab Exercises

- Knowledge Check (verified track only)

Chapter 4. OSS Licensing and Legal Issues

- Introduction & Learning Objectives
- OSS Licensing & Legal Issues
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 5. How to Work in OSS Projects

- Introduction & Learning Objectives
- Working in OSS Projects
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 6. Leadership vs Control and Why Projects Fail

- Introduction & Learning Objectives
- Leadership vs Control and Why Projects Fails
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 7. Respecting and Encouraging Diversity in OSS

- Introduction & Learning Objectives
- Diversity in OSS
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 8. Continuous Integration

- Introduction & Learning Objectives
- Continuous Integration Overview
- Knowledge Check (verified track only)

Chapter 9. GitHub and Other Hosting Providers

- Introduction & Learning Objectives
- GitHub & Other Hosting Providers Overview
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 10. Linux and the Operating System

- Introduction & Learning Objectives
- Linux and the Operating System Overview
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 11. Graphical Environments and Interfaces

- Introduction & Learning Objectives
- Graphical Environments and Interfaces Overview

- Lab Exercises
- Knowledge Check (verified track only)

Chapter 12. System Administration

- Introduction & Learning Objectives
- System Administration Overview
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 13. Getting Help

- Introduction & Learning Objectives
- Getting Help: Resources and Utilities
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 14. Text Editors

- Introduction & Learning Objectives
- Text Editors Overview
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 15. Shells, Bash, and the Command Line

- Introduction & Learning Objectives
- Shells, Bash and the Command Line: Overview
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 16. Filesystem Layout, Partitions, Paths, and Links

- Introduction & Learning Objectives
- Filesystem Layout, Partitions, Paths and Links: Overview
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 17. System Initialization

- Introduction & Learning Objectives
- System Initialization Overview
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 18. Memory

- Introduction & Learning Objectives
- Memory Overview
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 19. Command Details

- Introduction & Learning Objectives
- Command Details Overview
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 20. Users and Groups

- Introduction & Learning Objectives
- Users and Groups: Overview
- Lab Exercises
- Knowledge Check (verified track only)
- Course Feedback

Final Exam (verified track only)

edX Platform

If you are using edX for the first time, we strongly encourage you to start by taking a free 'how to use edX' course that the team at edX has made available. In this course, you will learn how to navigate the edX platform, how to connect with other edX learners, how to answer problems on the edX platform, how grades work in edX courses, and how to complete your first course.

Click here to register for "*DemoX*" and you will be on your way. You will find the edX platform simple and intuitive.

Getting Help

For any **technical issues** with the edX platform (including login problems and issues with the Verified Certificate), please use the **Help** icon located on the upper right side of your screen.

One great way to interact with peers taking this course and resolving any **content-related issues** is via the **Discussion Forums**. These forums can be used in the following ways:

- To discuss concepts, tools, and technologies presented in this course, or related to the topics discussed in the course material.
- To ask questions about the course content.
- To share resources and ideas related to open source projects and Linux.

We strongly encourage you to not only ask questions but to share with your peers' opinions about the course content, as well as valuable related resources. The Discussion Forums will be reviewed periodically by the Linux Foundation staff, but it is primarily a community resource, not an 'ask the instructor' service.

To learn more tips on how to use them, read the following article: *"Getting the Most Out of the edX Discussion Forums"*.

Course Timing

This course is entirely self-paced; there is no fixed schedule for going through the material. You can go through the course at your own pace, and you will always be returned to exactly where you left off when you come back to start a new session. However, we still suggest you avoid long breaks in between periods of work, as learning will be faster and content retention improved.

The chapters in the course have been designed to build on one another. It is probably best to work through them in sequence; if you skip or only skim some chapters quickly, you may find there are topics being discussed you have not been exposed to yet. But this is all self-paced and you can always go back, so you can thread your own path through the material.

Learning Aids

Besides simple exposition through text and figures, this course uses additional methods to present the learning material, including hands-on exercises, video demonstrations and knowledge check questions (Verified Certificate track only).

Audit and Verified Tracks

You can enroll in an audit or a verified track. In an audit track, you will have access to all ungraded course content: course readings, videos, and learning aids, but no certificates are awarded when auditing. You will not be able to access any graded content (knowledge check questions at the end of each chapter, and the final exam).

In order to receive a certificate, you will need to obtain a passing grade (please refer to the “Grading” section below), verify your identity with edX, and pay a fee. Once all edX requirements have been met, you can download your certificate from the Progress tab.

To learn more about audit and verified tracks, visit edX Help Center > Certificates.

Grading (Verified Certificate track only)

At the end of each chapter, you will have a set of graded **knowledge check questions**, that are meant to further check your understanding of the material presented. The grades obtained by answering these knowledge check questions will represent **20%** of your final grade.

The remaining **80%** of your final grade is represented by the score obtained in the **final exam**. The final exam is located at the end of the course and it consists of 40 questions.

You will have a maximum of two attempts to answer each knowledge check and final exam question (other than True/False questions, in which case, you have only one attempt). You are

free to reference your notes, screens from the course, etc., and there is no time limit on how long you can spend on a question. You can always skip a question and come back to it later.

In order to complete this course with a passing grade, you must obtain a passing score (knowledge check and final exam) of minimum 70%.

Course Progress and Completion (Verified Certificate track only)

Once you complete the course (including knowledge check questions and final exam), you will want to know if you have passed. You will be able to see your completion status using the **Progress** tab at the top of your screen, which will clearly indicate whether or not you have achieved a passing score.

Professional Certificate Program

Professional Certificate programs are a series of courses designed by industry leaders and top universities to build and enhance critical professional skills needed to succeed in today's most in-demand fields.

To learn more about our Professional Certificates, visit the edX website.

About The Linux Foundation

The Linux Foundation provides a neutral, trusted hub for developers to code, manage, and scale open technology projects. Founded in 2000, The Linux Foundation is supported by more than 1,000 members and is the world's leading home for collaboration on open source software, open standards, open data and open hardware. The Linux Foundation's methodology focuses on leveraging best practices and addressing the needs of contributors, users and solution providers to create sustainable models for open collaboration.

The Linux Foundation hosts Linux, the world's largest and most pervasive open source software project in history. It is also home to Linux creator Linus Torvalds and lead maintainer Greg Kroah-Hartman. The success of Linux has catalyzed growth in the open source community, demonstrating the commercial efficacy of open source and inspiring countless new projects across all industries and levels of the technology stack.

As a result, the Linux Foundation today hosts far more than Linux; it is the umbrella for many critical open source projects that power corporations today, spanning virtually all industry sectors. Some of the technologies we focus on include big data and analytics, networking, embedded systems and IoT, web tools, cloud computing, edge computing, automotive, security, blockchain, and many more.

The Linux Foundation Events

Over 85,000 open source technologists and leaders worldwide gather at Linux Foundation events annually to share ideas, learn and collaborate. Linux Foundation events are the meeting place of choice for open source maintainers, developers, architects, infrastructure managers, and sysadmins and technologists leading open source program offices, and other critical leadership functions.

These events are the best place to gain visibility within the open source community quickly and advance open source development work by forming connections with the people evaluating and creating the next generation of technology. They provide a forum to share and gain knowledge, help organizations identify software trends early to inform future technology investments, connect employers with talent, and showcase technologies and services to influential open source professionals, media, and analysts around the globe.

The Linux Foundation hosts an increasing number of events each year, including:

- Open Source Summit North America, Europe, and Japan
- Embedded Linux Conference North America and Europe
- Open Networking & Edge Summit
- KubeCon + CloudNativeCon North America, Europe, and China
- Automotive Linux Summit
- KVM Forum
- Linux Storage Filesystem and Memory Management Summit
- Linux Security Summit North America and Europe
- Linux Kernel Maintainer Summit
- The Linux Foundation Member Summit
- Open Compliance Summit
- And many more.

To learn more about The Linux Foundation events and to register, click here.

The Linux Foundation Training

The Linux Foundation offers several types of training:

- Classroom
- Online
- On-site
- Events-based.

To get more information about specific courses offered by the Linux Foundation, click here.

The Linux Foundation Certifications

The Linux Foundation certifications give you a way to differentiate yourself in a job market that's hungry for your skills. We've taken a new, innovative approach to open source certification that allows you to showcase your skills in a way that other peers will respect and employers will trust:

- You can take your certification from any computer, anywhere, at any time.
- The certification exams are either performance-based or multiple choice.
- The exams are distribution-flexible.
- The exams are up-to-date, testing knowledge and skills that actually matter in today's IT environment.

For a list of currently offered certifications, click here.