

# Git for Distributed Software Development (LFD109x)

## Course Overview

With Linux having thousands of developers spread worldwide, working on many different time zones and on various complex projects, it became imperative to coordinate and keep track of all that work in a rational way. Because Git was designed for that purpose, it has grown to be used by literally millions of other projects; it is the underpinning of most open source software work that is being done today.

The purpose of this course is to get you up and running and being able to contribute and use Git in a relatively short amount of time. We won't cover in great detail some of the most complicated workflows that you can run into if your team is already using Git, but upon course completion you should be able to understand what tools are needed to successfully handle more complex issues.

Let's begin the adventure of using Git and learn how to use it in our everyday work.

## Course Learning Objectives

By the end of this course, you will learn the following:

- What Git is and how to install it.
- How to initialize a repository, make changes in it, make it available to others, and acquire and use the changes made by other individuals.
- How to find errors in your work and how to go back to a working copy to quickly identify the change that produced the error.
- Some essential Git procedures, such as cloning, branching, making commits, getting diffs, doing merges, and rebasing.
- Complicated workflows, so you understand how to approach them when problems arise.

## Prerequisites

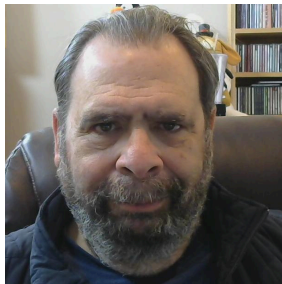
To make the most of this course, a Linux system is necessary. Either a physical or a virtual machine, and any modern distribution will work. You will need to have experience as a developer on any operating system. You will need some experience in working at the command line is not necessary, but would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

Lab exercises in this course are designed to work either on native hardware, or using a virtual machine (VM), under a hypervisor, such as those in the KVM, VMWare, or Virtual Box families. Detailed instructions to set up your lab environment are provided in the course.

## Audience

This course is designed for computer users who have limited or no experience working in a Linux environment; and/or for those who already have done some work on Linux systems and are looking to gain a good grasp on Linux tools for software development.

## Course Instructor(s)



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

15 hours

## Course Outline

### Welcome!

- Welcome!

## **Chapter 1. Introduction to Git**

- Introduction
- Git Overview
- Lab Exercises
- Knowledge Check (Verified Certificate track only)

## **Chapter 2. Git Installation**

- Introduction
- Git Installation
- Lab Exercises
- Knowledge Check (Verified Certificate track only)

## **Chapter 3. Git and Revision Control Systems**

- Introduction
- Git and Revision Control Systems
- Lab Exercises
- Knowledge Check (Verified Certificate track only)

## **Chapter 4. Using Git: An Example**

- Introduction
- Using Git: An Example
- Lab Exercises
- Knowledge Check (Verified Certificate track only)

## **Chapter 5. Git Concepts and Architecture**

- Introduction
- Git Concepts and Architecture
- Lab Exercises
- Knowledge Check (Verified Certificate track only)

## **Chapter 6. Managing Files and the Index**

- Introduction
- Managing Files and the Index
- Lab Exercises
- Knowledge Check (Verified Certificate track only)

## **Chapter 7. Commits**

- Introduction
- Commits
- Lab Exercises
- Knowledge Check (Verified Certificate track only)

## **Chapter 8. Branches**

- Introduction
- Branches
- Lab Exercises
- Knowledge Check (Verified Certificate track only)

## **Chapter 9. Diffs**

- Introduction
- Diffs
- Lab Exercises
- Knowledge Check (Verified Certificate track only)

## **Chapter 10. Merges**

- Introduction
- Merges
- Lab Exercises
- Knowledge Check (Verified Certificate track only)

## **Chapter 11. Managing Local and Remote Repositories**

- Introduction
- Managing Local and Remote Repositories
- Lab Exercises
- Knowledge Check (Verified Certificate track only)

## **Chapter 12. Using Patches**

- Introduction
- Using Patches
- Lab Exercises
- Knowledge Check (Verified Certificate track only)

## **Chapter 13. Advances Git Interfaces: Gerrit**

- Introduction
- Advanced Git Interfaces: Gerrit

- Lab Exercises
- Knowledge Check (Verified Certificate track only)
- Course Feedback

**Final Exam** (Verified Certificate 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 course content.
- To share resources and ideas related to git.

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.

## 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 into 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 32 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 [edX website](#).

## About the Linux Foundation

The Linux Foundation is the world's leading home for collaboration on open source software, hardware, standards, and data. Linux Foundation projects are critical to the world's infrastructure, including Linux, Kubernetes, Node.js, ONAP, PyTorch, RISC-V, SPDX, OpenChain, and more. The Linux Foundation focuses on leveraging best practices and addressing the needs of contributors, users, and solution providers to create sustainable models for open collaboration. For more information, please visit us at [linuxfoundation.org](https://linuxfoundation.org). The Linux Foundation has registered trademarks and uses trademarks. For a list of trademarks of The Linux Foundation, please see its trademark usage page: [www.linuxfoundation.org/trademark-usage](https://www.linuxfoundation.org/trademark-usage). Linux is a registered trademark of Linus Torvalds.

## The Linux Foundation Events

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

- Open Source Summit North America, Europe, Japan and China
- Embedded Linux Conference + OpenIoT Summit North America and Europe
- Open Source Leadership Summit
- Open Networking Summit North America and Europe
- 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
- Cloud Foundry Summit
- Hyperledger Global Forum

- 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](#).

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