



## Introduction to Git- 24 hours

### General

Git is the de-facto standard source control system for the tech industry and is one of the most flexible software tools to be found. Any developer or devops person probably needs at least a basic understanding of Git to get going and this course is intended for that purpose.

This course covers all of the fundamental operations an experienced coder would use on a daily basis. The course begins with an introduction to Git and a comparison of Git to other version control systems. It then transitions into the nuts-and-bolts of working with Git, including everything from setting up a repository to advanced topics like branching and merging.

Because the industry sometimes misuses git this course is also focuses on clearing up muddled understanding of git: the staging area, merge vs rebase, history management, branching and more

### Intended Audience

- Any software developer or devops who needs to work with Git or understand Git better.
- Any software developer who has worked with Git but wants a deeper understanding of it.
- System administrators who are moving to devops in general or Git specifically.
- Any manager who needs to understand what is possible and how to manage git using projects.

## Prerequisites

- Tech affinity.

## At the end of the course participants could

- Setup and use git
- Understand and use git's branching features correctly and effectively
- Decide on which workflows to use when using Git

## Outline

- Introduction to Git
  - History of Git
  - Who is using Git
  - Adopting Git
- Core Git Concepts
  - Always on a branch
  - Everything is sha1 (files, changes, tags, branches)
  - Everything has a parent except first change.
  - Never store anything twice
  - sha includes all history
  - sha is unique in the world
- Git basics
  - Setting up a local repository
  - Setting up a client to a repository
    - local
    - remote
  - The staging area
  - Making your first change
  - Committing
  - Seeing history
  - Renaming, moving and removing files
- Configuring git
  - local and global config files
  - configuring git commands
  - configuring signing
  - adding aliases
  - ignoring files
- Undoing things
  - Staging area undoings
  - Undoing latest commit
  - Undoing last n commits
  - Cherry picking from latest commits
- Remote repositories
  - Working with a remote repository
  - Setting up / publishing a repository
  - Understanding the repository structure
  - Working with Multiple remotes
  - Working with GitHub

- Branches
  - Creating local branches
  - Working on local branches
  - Committing on local branches
  - Moving between local branches
  - Pruning branches
- Merging changes
  - git fetch
  - git pull
  - git rebase
  - what is fast forwarding?
  - cherry picking
  - handling conflicts
    - basics
    - using merge tools
- Merge vs Rebase
  - Which should you choose? (Rebase)
  - Why?
- Workflows
  - git does not force a workflow
  - feature branches
  - dev vs production
  - back porting changes
  - Examples of workflows
    - working on your own workflow
    - Jenkins
    - pull requests
- Getting git data
  - Git log and it's many options
  - Visual tools
  - Using programming (example is python)
- Under the hood
  - The git object store and how it works
  - What happens when you "git add"
  - What happens when you commit?
  - What happens when you create an annotated tag?
  - What happens when you branch?
- Worktrees
  - Why are they needed?
  - Creating a worktree
  - Working with worktrees
  - Pruning worktrees
- Tagging
  - Why tag?
  - difference between anotates and non annotated tags
  - pushing and pulling tags
  - Using tags in oter git commands
- Rewriting History
  - Why you should never do it
  - How to do it anyway
- Stashing
  - Why would you want stashing?
  - Creating and naming stashes
  - Apply a specific stash
  - Delete stashes

- Git hooks
  - How to set up hooks?
  - What guarantees do you get?
- External git tools
  - GitHub and BitBucket
  - Gitlab
  - Git and IDEs
  - Git and Jenkins, Bamboo etc