**🗺️ Linux Learning Roadmap (Beginner to Advanced)**

**🔰 Phase 1: Getting Started with Linux (Weeks 1–2)**

**Goals:**

* Understand what Linux is
* Learn basic terminal usage
* Get comfortable with the Linux environment

**Topics to Cover:**

* What is Linux? (Distributions, kernel vs OS)
* Choosing a Linux distro: Ubuntu, Fedora, or Linux Mint (start with Ubuntu)
* Installing Linux (dual-boot, VM via VirtualBox, or WSL on Windows)
* Basic shell/terminal commands

**Resources:**

* 📘 [The Linux Command Line by William Shotts (free book)](https://linuxcommand.org/tlcl.php)
* 🎥 YouTube: “Linux Tutorial for Beginners” by freeCodeCamp (4 hrs)
* 🖥️ Distro: [Ubuntu Desktop](https://ubuntu.com/download/desktop)
* 🛠️ Tool: [VirtualBox](https://www.virtualbox.org/) or [WSL](https://learn.microsoft.com/en-us/windows/wsl/install)

**🔧 Phase 2: Command Line and Shell Scripting (Weeks 3–5)**

**Goals:**

* Master shell commands
* Understand the Linux file system
* Start automating tasks with bash scripts

**Topics to Cover:**

* File and directory management (ls, cd, cp, mv, etc.)
* File permissions, ownership (chmod, chown)
* Bash shell scripting basics (if, while, for, variables)
* Process management (ps, top, kill)
* Package management (apt, dnf, yum)

**Resources:**

* 📘 [Bash Scripting Tutorial](https://ryanstutorials.net/bash-scripting-tutorial/)
* 🧠 Practice: [OverTheWire: Bandit](https://overthewire.org/wargames/bandit/) (hands-on terminal challenges)
* 🎥 YouTube: NetworkChuck Linux videos

**🛠️ Phase 3: System Administration Basics (Weeks 6–8)**

**Goals:**

* Learn to manage users, groups, processes, and services
* Understand logs and crontabs
* Introduction to systemd

**Topics to Cover:**

* User & group management (adduser, usermod, passwd)
* Permissions & sudo
* System monitoring tools (htop, vmstat, iotop)
* Managing services (systemctl, service)
* Log files and troubleshooting (/var/log)
* Scheduling with cron

**Resources:**

* 📘 [Linux Essentials (LPI)](https://learning.lpi.org/en/learning-materials/)
* 📘 [How Linux Works, 2nd Edition](https://www.nostarch.com/howlinuxworks2)
* Practice: Setup a local web server (Apache/Nginx) or FTP server

**🌐 Phase 4: Networking and Security (Weeks 9–12)**

**Goals:**

* Learn Linux networking
* Understand firewalls, SSH, and security best practices

**Topics to Cover:**

* IP, DNS, DHCP basics
* Network tools (ping, traceroute, netstat, nmap, ss)
* SSH (ssh, scp, rsync)
* UFW/iptables firewall basics
* File integrity, backups, and system hardening

**Resources:**

* 📘 [Linux Security Fundamentals (Cybrary)](https://www.cybrary.it/)
* 🎥 YouTube: LiveOverflow or The Cyber Mentor (for infosec basics)
* Lab: Set up SSH access and firewall rules on a local VM

**📦 Phase 5: Advanced Linux Topics (Weeks 13+)**

**Goals:**

* Deepen understanding of Linux internals
* Manage services, containers, and advanced scripting

**Topics to Cover:**

* Kernel modules and configuration
* System performance tuning
* LVM and disk partitioning
* Docker & containers on Linux
* init vs systemd
* Automate with Ansible

**Resources:**

* 📘 [UNIX and Linux System Administration Handbook](https://www.oreilly.com/library/view/unix-and-linux/9780134278292/)
* 🧠 Labs: Set up Docker, write advanced bash scripts
* 🎥 YouTube: LearnLinuxTV, TechWorld with Nana

**🧪 Practice & Projects (All Phases)**

* ✅ Daily use of the terminal (even basic tasks)
* 🗂️ Setup a personal server or a home lab using VirtualBox
* 🐧 Contribute to open-source Linux tools on GitHub
* 💬 Join Linux forums (Stack Overflow, Reddit r/linux4noobs, Arch forums)
* 🔒 Capture The Flag (CTF) and Linux-based wargames

**🛠️ Essential Tools**

| **Tool** | **Purpose** |
| --- | --- |
| VirtualBox or VMware | Run Linux VMs locally |
| Git | Version control for your scripts |
| tmux | Terminal multiplexer |
| SSH | Remote access |
| htop, ncdu, iftop | System/resource monitoring |
| Docker | Containers and DevOps |
| Ansible | Configuration management |

**🧭 Tips for Success**

* Use Linux as your daily driver (install on real hardware or VM)
* Build something: web server, firewall, media server, automation scripts
* Document everything (create your own Linux notes or blog)
* Stay consistent: even 30 mins daily practice works wonders