

# Suggested Syllabus – Full-on First Linux Course

Welcome. Many people have heard of Linux, but are not familiar with it. If you have not, it is a free(as in price) open-source replacement for Windows for desktop PCs, laptops, and servers. This course teaches you how get, install, configure, and keep up to date a Linux system that can duplicate over 90% of the functionality of a Windows desktop and replace a Windows web and mail server at zero cost for the software. The only prerequisites are a basic knowledge of Windows and computer hardware. So long as you know what the CPU, hard drive, RAM, and the computer case are, and the meaning of the terms point, click, drag, and drop, there are no other prerequisites. The course is open to anyone who is interested in learning Linux.

The course was designed to be usable to the widest variety of people in the greatest number of circumstances. To that end, the following guidelines were used:

- Be hardware non-intensive - the course was authored and tested on an aging Lenovo 3000 N100 laptop with 2 GB of RAM, 256MB of video RAM and an 80GB SATA hard disk on a 63Kbps Internet connection in Soldotna, Alaska. Nearly any machine manufactured in the last three years will meet or exceed these specifications. No additional hardware is required. An optional USB hard disk can be purchased if the student does not wish to store the Linux virtual machines created in the course on the installed hard drive.
- Be completely web-based - This course takes full advantage of the web, including screen shots, detailed screen output, and videos to demonstrate procedures and concepts. It can be accessed anywhere there is an Internet, 24/7. All required software is open-source and can be downloaded for free over the web.
- Must work in Windows or Linux and be non-invasive - The course makes use of virtual machines, via an open-source product called VirtualBox, to enable the student to run Linux and Windows on the same machine at the same time. There is no need to modify the existing operating system in any way. When the coursework is finished for the day, the virtual machines can be shut down and the PC can be used normally.
- Learn by doing - The exercises in this course are designed to be completed in order at the student's own pace, within the constraints of the school year or training schedule. It is important to actually complete the exercises. The point of using virtual machines is to give students real, network-accessible Linux machines to configure. More experienced students can read ahead, but many of the later lessons depend on configurations performed in prior lessons, so linear progression is best, especially for first-time Linux users. Students who do skip earlier portions of the course, are encouraged to at least read through the configurations in the topics skipped.

This course uses the tell me, show me, let me approach to accommodate a diverse range of learning styles. The written material includes numerous screenshots and videos. The student is expected to follow along using one or more virtual machines as instructed. At the end of most lessons are a short true/false, matching, or multiple-choice quiz and one or more additional activities that either require the students to practice certain critical skills until they no longer need to refer to the course material or to apply the concepts taught in the lessons in slightly different ways, challenging the student to go beyond mere rote memorization of procedure.

## Organization

The course topics and exercises are presented in outline form, with each topic providing a series of how-to lessons or activities with which the student is supposed to follow along on a physical or virtual Linux machine. Most lessons involve installing and configuring one or more pieces of software and generally follow the format below:

- Installation of the software dependencies
- Installation of the software
- Configuration of the software
- Demonstration of the basic use of the software

### ***Text conventions used in this course***

- Body text containing theory and narrative is in arial font.
- Commands and text the student should actually type is in courier new font.
- **Text output to the screen is in bold courier new font.**

## Course Objectives

Upon completion of this course, students will be able to perform the following tasks:

- Obtain a Linux distribution ISO file over the Internet, burn it to a CD or DVD, and install Linux onto a computer.
- Set up a virtual lab environment.
- Install The Linux operating system to a physical or virtual machine.
- Bring the installed Linux distribution software up to date.
- Configure third-party software repositories and install and remove third-party Linux software.
- Install and access the basic features of OpenOffice, InkScape, and Scribus on the Linux Desktop.
- Install non-RPM software and do a basic software compilation from source code.
- Configure a Linux desktop workstation using the Fedora Linux distribution, put that workstation on a network.
- Install and perform a basic working configuration of the DHCP, DNS, HTTP(web), database, and SMTP(mail) services.
- Perform the basic steps necessary to configure a Linux iptables firewall.
- Use the Linux system they create for further study and experimentation.

## Course Topics

- Linux/open source software history
- Course navigation
- Essential Linux commands

- Obtaining and burning ISO files
- Linux installation planning and procedures
- Disk partition planning
- Hardware compatibility testing
- Live CD usage
- System updates
- Password recovery
- RPM software installation
- Non-RPM software installation
- Virtual machines/VirtualBox
- Desktop applications overview
- Basic network configuration
- Firewall configuration
- ISC DHCP server configuration
- BIND DNS server configuration
- Apache Web server configuration
- Drupal installation and setup
- Postfix mail server configuration

## **Textbooks and Materials Needed**

- There is no textbook required for this course.
- The course is based on Fedora13/14 Linux. All software mentioned in the course is available for free either from the Fedora Linux software repositories or from the various open source software sites on the Internet. The student does not need to purchase any software.
- One blank CD and one blank DVD or two DVDs. The student will be required to use Linux ISO files to create bootable installation and test media for use throughout the course. If this course is taught in a classroom situation, it will save considerable time if the instructors prepare the Live CD and installation DVD media in advance and give a copy to all students when they arrive the first day. This avoids problems with slow Internet connections.
- High-speed DSL or faster Internet access.
- This course uses the Moodle distance learning environment. Several of the security features in Moodle are not compatible with Internet Explorer(IE) and are routinely mishandled in IE. The only way to avoid this is to turn off protected mode in Internet Explorer. Therefore, this course is best viewed using the Firefox web browser.

## **Contact the Course Author/Instructor**

- E-mail(best way) [rdtradecraft@gmail.com](mailto:rdtradecraft@gmail.com) - Please put Full-on First Linux Student in the subject if you do not want to be kicked to the spam folder.

- Course forum - As time availability permits. The author is a practicing network consultant and will check the class frequently, but cannot guarantee availability on the forums.

## Course Activities

- Reading – The required reading material is posted on the web in the course pages. It is highly recommended that students carefully read all the written course material. It contains a lot of information that is not easily done with screenshots or video.
- Videos – Videos accompany many of the web pages in several topics. Students are encouraged to replay and try to follow the videos with their own machines rather than just watch and memorize.
- Machine Configurations – One nice thing about using virtual machines is that students actually get to configure working machines, rather than mere simulations, without the need of extra hardware. This course is meant to be a learn-by-doing course. The instructions in each lesson are meant to be followed hands-on using the virtual machines. The "test" comes in getting the machine to work as it does in the lessons and videos.
- End-of-topic Quizzes – Quizzes are designed to help students recall important information in the course material. Anything in the written or video content may be in a quiz and the written and video material is not identical. Both will need to be looked at to be able to pass the quizzes easily. Each quiz may be taken repeatedly, but only the score for the first attempt is counted. Instructors will be able to override this in a classroom environment.
- Knowledge Checks – Exercises at the end of several topics that require the student to apply the information learned in prior sections and activities. These are mandatory. Students are allowed to use outside resources, such as Google, or to consult with each other to complete knowledge checks, if necessary. These are not so much tests or quizzes as conceptual teaching tools, though they can serve that function. Knowledge checks are intended challenge the student to apply previously taught concepts in slightly different ways and are invaluable to ensure real understanding of the material.
- Knowledge Explorations – These are like knowledge checks, but are meant only to expose students to a wider array of Linux applications or techniques than are covered in the course, hopefully, to spark curiosity and further experimentation.

## Suggested Schedule

This course is designed to be self-paced, but students should budget a minimum of six hours a week, two to three days a week, over eight to twelve weeks. This assumes all students have no prior Linux experience and only basic knowledge of computers. Portions of the course may require slightly more or less time on certain days, depending on knowledge level, the computer hardware used, and network connection speed. Those who are willing to put in more time or who have more experience will complete the course faster.

## Grading

- This is an ungraded course primarily intended to be home-study/pass-fail, but the quizzes and knowledge checks can provide the basis for letter grades if that is required or more convenient in a classroom or training environment. e.g. score  $\geq 90\%$  on all quiz material and pass the final knowledge check in a timed and monitored environment = A.

## Testing

- The quizzes can be used as either knowledge checks or tests at the instructor's discretion.
- The entire course is one big performance exam. This course proceeds from the assumption that the important question is, can you install and configure a Linux system successfully? If you completed all of the activities and got everything working as prescribed, consider yourself to have passed. Learning Linux tends to go in fits and starts. Progress over some portions of the course will be rapid and easy. In other areas, it may take days to finally figure out some small detail that has been missed or gotten wrong. This is normal and is meant to simulate actual working conditions in production environments.