CS 300 – Introduction to Linux – Spring 2016
Online (Distance Education)

The course webpage is available via D2L:  http://online.siu.edu

Professor:  Dr. Norman Carver, Faner 3121, phone 453-6048, email: carver@cs.siu.edu.
Office hours:  MWF 1:00-3:00 p.m.  (or by appointment).

TA:  Shashi Ankollu, email: askreddy92@siu.edu.

Text:  See the course webpage for links to (free) online material.

Workload:  Homeworks (40% total), midterm exam (30%), final (30%).

Course Objectives:

- Familiarity with the Linux operating system.
- The ability to use Linux effectively, both via GUI and CLI.
- The ability to install Linux on a personal computer.
- The ability to configure and secure a Linux installation.
- The ability to maintain a Linux installation.

A gentle introduction to the Linux operating system for non-CS majors.  Previous experience with Linux and computer programming is not expected, merely experience using Microsoft Windows or Apple OS X.  Students will first gain the knowledge and hands-on experience to be able use Linux systems effectively for a variety of tasks.  Linux replacements for common GUI software applications will be surveyed.  Students will also be introduced to use of the command line (CLI), a powerful tool for many tasks.  Later, students will learn how to choose an appropriate Linux distribution, install it, configure it, and secure it.  The course will conclude with consideration of basic administration skills, including keeping the OS updated and backing up user data.

Course Details:

- Because this is an online course, most student interaction will take place via D2L and email.  Students need to visit the D2L course page regularly, to keep up with what work has been assigned and to participate in the forums.

- **Students must have access to a working Linux installation for this course.** To get the most out of it, they should also have access to a machine on which they can practice Linux installs.  Luckily, both can now easily be accomplished using **virtual machine software**.  However, this software does require a *suitably powerful machine!* Please see the course D2L page for more information.
• Students that lack a suitable machine for running Linux and are on-campus can get access to the CS Dept. Linux Lab (email the instructor). Students that are off campus will have to make arrangements: you will not be able to complete assignments without access to a working Linux!!
• Course content will be delivered via online videos from the instructor and other sources, plus free online reading material. Students are responsible for visiting the course D2L page to see what material has been assigned for them to view/read, and they are responsible for keeping up with these assignments.
• Course exams will be administered online, via D2L.

Detailed Course Outline:

• Linux Introduction:
  – what it is and where it is used today
  – “Linux” vs Android (and Chrome OS)
  – what is an OS and why is it needed
  – OS (kernel) vs interfaces, libraries, applications
  – Linux history
  – Linux vs UNIX
  – FOSS and key FOSS projects
  – distributions (vs “Linux”)
  – why one might want to use Linux (advantages vs Windows)
  – why one might not (advantages of Windows)

• Installing and Running Linux for Class:
  – virtualization, virtual machines, and VirtualBox
  – course distros: Mageia, Mint, Ubuntu
  – distro VM image setup in VirtualBox

• Linux CLI/GUI:
  – OS interfaces: CLI vs GUI
  – why the CLI is useful to know
  – shells (the CLI)
  – terminals vs shells vs consoles
  – “UNIX design philosophy”
  – the Linux/UNIX GUI: X11, window managers, desktop environments, etc.
  – KDE (DE) and its applications
  – GNOME (DE) and its applications
  – Non-DE GUI apps
  – package managers and third-party software
• Linux Basics:
  – the (logical) filesystem (directory hierarchy)
  – regular vs special files
  – filenames
  – file commands
  – users and groups, the root user
  – file permissions
  – the UNIX security model
  – permissions commands
  – processes
  – process attributes
  – process commands

• The Bash shell (CLI)
  – Bash and other shells
  – shells are command interpreters
  – pipelines and filters
  – shell expansions: metacharacters, file gloving, etc.
  – features for interactive use
  – shell scripts (shell programs)
  – key commands

• Distributions:
  – distributions vs “Linux”
  – why so many, what are the differences
  – advantages of so many: choice
  – disadvantages of so many: variability
  – choosing a distro to run
  – choosing a desktop environment
  – important distros

• Installing Linux:
  – installation options (VM, disk, dual-boot, USB, live CD, etc.)
  – preparation for an install
  – possible laptop and other hardware issues
  – range of Linux distro installers
  – post-install configuration

• Software/Applications Management:
  – package managers
  – distro-supplied software vs third-party
  – software security considerations
  – desktop environments and apps
  – updates
• Security:
  – limiting running services/servers
  – firewall tools
  – securing servers
  – security audit software
  – malware and “virus scanning” software?

• Administrative Tasks:
  – CLI vs GUI tools
  – updates
  – backups
  – network changes
  – remote administration via SSH
  – interacting with other OS’s and devices