Course Number	CS 406	Course Title	Basic Linux System Administration
Semester Hours	3	Course Coordinator SP20	Norman Carver
Catalog Description	This course will be an introduction to the administration of Linux systems, with emphasis on security for networked systems. Topics to be covered include: installation and configuration of Linux distributions, typical maintenance activities, and security measures for networked systems. Students will have access to lab machines for hands on practice.		

Textbooks
SP20

Nemeth, E., Snyder, G., Hein, T.R., & Whaley, B. (2018). *Unix and Linux System Administration Handbook*. Addison-Wesley, 5th Edition. ISBN: 9780134277554.

References

Course Learning Outcomes

- To learn to install and maintain networked Linux systems.
- To learn the security issues that face networked systems.
- To learn how to assess, secure, and monitor networked Linux systems.
- To gain some familiarity with common network server software packages.

Assessment of the Contribution to Student Outcomes

Outcome →	1	2	3	4	5	6	7
Assessed →	X		X				

Prerequisites by Topic

CS 306 with a grade of *C* or better or graduate standing.

Major Topics Covered in the Course

1. Linux Basics
   GUI: X11, KDE, Gnome, etc.
   CLI: shells, key commands
   OS basics: root, UIDs, GIDs, file system, processes, signals {4 classes}
2. Linux distribution selection, installation, and configuration
   Preparation: network settings, hardware, disk partitioning, backups boot loaders and booting multiple OS
   Installation: settings, software, services
   Configuration: distribution tools, initial settings, network
   Basic security: services, permissions, tcp wrappers, etc {9 classes}
3. System maintenance
   Software installation: compiling from source vs. packages
   Software updating/patching, system monitoring and log files, backup's kernel compilation.
   {4 classes}
4. Overview of computer security issues: software bugs (buffer overflows, format string bugs), privilege escalation, passwords, users/groups, and permission, networking basics, foot printing, scanning, OS detection, and enumeration, network attacks and services, denial of service attack {6 classes}
5. System security measures: security scanners, firewalls, port scanning, scan detectors, log file assessment, intrusion detection systems, server configuration/hardening {9 classes}
6. Encryption 2:encryption basics
   Tools: SSH, SSL, GPG/PG {2 classes}
7. Servers and service: remote access (e.g., SSH, FTP, Telnet), file/print sharing (e.g., NFS, Samba, CUPS), mail and web (e.g., Send mail, Apache, Tomcat), authentication (e.g., NIS, LDAP), DNS (Bind), database (mySQL) {10 classes}

NOTE: When course is taken as 500-level credit (CS 591 "Special Topics"), there will be additional requirements such as a research project.