

<b>Course Number</b>	<b>CS 406</b>	<b>Course Title</b>	<b>Basic Linux System Administration</b>			
<b>Semester Hours</b>	<b>3</b>	<b>Course Coordinator</b>	<b>Norman Carver</b>			
<b>Catalog Description</b>	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.					
<b>Textbooks</b>						
SP20						
Nemeth, E., Snyder, G., Hein, T.R., & Whaley, B. (2018). <i>Unix and Linux System Administration Handbook</i> . Addison-Wesley, 5 <sup>th</sup> Edition. ISBN: 9780134277554.						
<b>References</b>						
<b>Course Learning Outcomes</b>						
<ul style="list-style-type: none"> <li>• To learn to install and maintain networked Linux systems.</li> <li>• To learn the security issues that face networked systems.</li> <li>• To learn how to assess, secure, and monitor networked Linux systems.</li> <li>• To gain some familiarity with common network server software packages.</li> </ul>						
<b>Assessment of the Contribution to Student Outcomes</b>						
SP20						
<b>Outcome →</b>	1	2	3	4	5	6
<b>Assessed →</b>		X				X
<b>Prerequisites by Topic</b>						
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}