

Northeastern University  
Graduate School of Engineering/Telecommunication Systems Management  
Boston, Massachusetts 02115

**Course Number:** TELE 5600  
**Course Name:** Linux for Network Engineers  
**Semester Hours:** 4  
**Class Meeting Times:** Friday 6:00pm – 9:20 pm  
**Room:** TBA

**Instructor:** James E. Jones  
**E-mail:** [ljf@coe.neu.edu](mailto:ljf@coe.neu.edu)  
**Office Hours:** Via Microsoft Teams, by appointment.

**Reference Texts:**

1. Ellen Siever, Stephen Figgins, Arnold Robbins, et. al., Linux in a Nutshell: A Desktop Quick Reference (6th Edition), O'Reilly
2. Evi Nemeth, Carth Snyder, et. al., Unix and Linux System Administration Handbook (5<sup>th</sup> Edition), Prentice Hall
3. Graham Glass, King Ables, UNIX for Programmers and Users
4. Bruce Blinn, Portable Shell Programming: An Extensive Collection of Bourne Shell Examples, Prentice-Hall PTR
5. William E. Shotts, Jr. The Linux Command Line, a Complete Introduction, No Starch Press
6. Naomi Ceder, The Quick Python Book 3<sup>rd</sup> Edition, Manning

**Equipment Requirement:** Because of the nature of this course, laptops will be **required equipment** for this class.

**Classroom Environment for Spring 2023:**

- *This course will be delivered in person, and students are expected to be physically present in class.*
- *Classes will be recorded to enable all students to review material covered in class. Please contact me if you have any concerns.*
- *Please feel free to ask questions, discuss, and interact with me and other students during the class.*
- *I will also be available for virtual office hours by appointment as mentioned in this syllabus.*

**Class Materials** related to lectures will be posted on Canvas. The URL for Canvas is:  
<https://canvas.northeastern.edu>

**Course Description:** This course is an introductory/survey course in the Linux operating system in a networking/Internet environment. This is a survey course covering several topics such as Linux system concepts, tools, and utilities, networking and security issues, data and text processing using scripts and filters.

**Prerequisite:** None.

**Grading:**

- Mini-Projects 30%
- Midterm 30%
- Final: 40%

Tests are presently planned to be held in the Canvas environment. More information will be forthcoming concerning the tests.

**Academic Integrity Policy:**

A commitment to the principles of academic integrity is essential to the mission of Northeastern University. The promotion of independent and original scholarship ensures that students derive the most from their educational experience and their pursuit of knowledge. Academic dishonesty violates the most fundamental values of an intellectual community and undermines the achievements of the entire University.

As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, examinations of whatever kind, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Students are responsible for learning the conventions of documentation and acknowledgment of sources in their fields. Northeastern University expects students to complete all examinations, tests, papers, creative projects, and assignments of any kind according to the highest ethical standards, as set forth either explicitly or implicitly in this Code or by the direction of instructors. Go to <http://www.northeastern.edu/osccr/academic-integrity-policy/> to access the full academic integrity policy.

**Student Accommodations:**

Northeastern University and the Disability Resource Center (DRC) are committed to providing disability services that enable students who qualify under Section 504 of the Rehabilitation Act and the Americans with Disabilities Act Amendments Act (ADAAA) to participate fully in the activities of the university. To receive accommodations through the DRC, students must provide appropriate documentation that demonstrates a current substantially limiting disability. For more information, visit <http://www.northeastern.edu/drc/getting-started-with-the-drc/>.

**Diversity and Inclusion:**

Northeastern University is committed to equal opportunity, affirmative action, diversity, and social justice while building a climate of inclusion on and beyond campus. In the classroom, members of the University community work to cultivate an inclusive environment that denounces discrimination through innovation, collaboration, and an awareness of global perspectives on social justice. It is my intention that students from all backgrounds and perspectives will be well served by this course, and that the diversity that students bring to this class will be viewed as an asset. I welcome individuals of all

ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, socioeconomic background, family education level, ability – and other visible and nonvisible differences. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class. Your suggestions are encouraged and appreciated.

Please visit <http://www.northeastern.edu/oidi/> for complete information on Diversity and Inclusion.

**TITLE IX:**

Title IX of the Education Amendments of 1972 protects individuals from sex or gender-based discrimination, including discrimination based on gender-identity, in educational programs and activities that receive federal financial assistance. Northeastern’s Title IX Policy prohibits Prohibited Offenses, which are defined as sexual harassment, sexual assault, relationship or domestic violence, and stalking. The Title IX Policy applies to the entire community, including male, female, transgender students, faculty, and staff. **In case of an emergency, please call 911.** Please visit [www.northeastern.edu/titleix](http://www.northeastern.edu/titleix) for a complete list of reporting options and resources both on- and off-campus

Class modules to be covered in the course are described below. Each module may take multiple class sessions to complete.

Modules	Topic	Readings [Book Number]
1	Introduction: <ul style="list-style-type: none"> <li>• login procedures, password management</li> <li>• manual pages and other help sources</li> <li>• creating and editing files (vi, other editors)</li> <li>• the Unix file system</li> </ul>	[1]
2	Working on the command line <ul style="list-style-type: none"> <li>• Basic Unix commands.</li> <li>• The Bourne and bash shell environment</li> <li>• Unix processes, how to control them</li> </ul>	[3]
3	<ul style="list-style-type: none"> <li>• The Bourne and bash shell environment</li> <li>• Personalizing the shell environment.</li> <li>• Intro to shell scripting</li> <li>• Unix utilities and filters</li> <li>• Using utilities and filters in shell scripts</li> </ul>	[2,3]
4	Unix scripting languages and applications	[3,6]

	<ul style="list-style-type: none"> <li>• Sed and Regular Expressions (regex)</li> <li>• Perl</li> <li>• Python</li> <li>• Why do we need scripting?</li> </ul>	
5 (Optional, time permitting)	<p>Networking, Network Services</p> <ul style="list-style-type: none"> <li>• configuring network connections</li> <li>• daemon processes and ports</li> <li>• networking using scripts: examples</li> <li>• ssh, ssh tunneling</li> <li>• diagnostic tools: netstat, nmap, wireshark</li> </ul>	[3,6]

Modules	Topic	Readings [Book Number]
6 (Optional, time permitting)	<p>Security Topics:</p> <ul style="list-style-type: none"> <li>• name and authentication services: LDAP</li> <li>• Access schemes like tcpwrapper</li> <li>• Other Topics</li> </ul>	[5]
7 (Optional, time permitting)	<p>System Admin topics:</p> <ul style="list-style-type: none"> <li>• boot loader (GRUB)</li> <li>• system initialization scripts and processes</li> <li>• file system creation, and types (ext3, ext4, etc)</li> <li>• networked file systems</li> <li>• installation (auto and otherwise)</li> <li>• configuration management (RCS, SVN)</li> <li>• system update tools</li> </ul>	[3] and other material