NEW YORK CITY COLLEGE OF TECHNOLOGY -CUNY

Computer Systems Technology Department

CST2415 – System Administration – UNIX/Linux

(2 class hours, 2 lab hours, 3 credits)

Course Description:

This course introduces students to fundamental networking administration concepts, and to principles and ideas of system administration common to various Network Operating Systems. It is designed to provide students with a broad understanding of Unix/Linux operating systems. Network administration concepts are demonstrated using Linux: installation and configuration, shell commands and programming, users and groups management, establishing basic security, configuring and managing data storage, system monitoring and troubleshooting. All concepts are demonstrated through laboratory assignments. A special set of labs has been developed to provide each student with the Administrator level of access to the operating system to perform network administration tasks.

Prerequisite:

CST2307 Networking Fundamentals

Required Materials:

The Complete Guide to Linux System Administration by Nick Wells.
ISBN-10: 0619216166 ISBN-13: 978-0619216160

Students should have a laboratory notebook and pen at all times.
Students are required to have a USB storage device for class projects.

Instructional Objectives:

- Demonstrate an understanding of the principles of System Administration, its goals and common practices
- Demonstrate an understanding of major networking models, protocols, TCP/IP networks and related terminology
- Demonstrate practical skills in Unix/Linux installation and configuration
- Demonstrate an understanding of the Unix/Linux file system and management of data storage
- Secure a Unix/Linux operating system and network, and implement use group policies
- Demonstrate an understanding of Linux networking and the tasks of server and network monitoring and troubleshooting; demonstrate skills in using related software tools
- Install applications in a Linux environment
- Demonstrate an understanding of Unix/Linux shell and shell scripting

General Education Outcomes:

- **SKILLS/Inquiry/Analysis:** Students will employ scientific reasoning and logical thinking. Use creativity to solve problems. Understand and employ both quantitative and qualitative analysis to describe and solve problems, both independently and cooperatively.

- **SKILLS/Communication:** Students will communicate in diverse settings and groups, using written (both reading and writing), oral (both speaking and listening), and visual mean.

- **INTEGRATION/ Work productively within and across disciplines/Information literacies** Gather, Interpret, evaluate, and apply information discerningly from a variety of sources.

- **INTEGRATION/ Work productively within and across disciplines /Systems** Students will **u**nderstand and navigate systems.

- **INTEGRATION/ Work productively within and across disciplines Integrate learning** Students will resolve difficult issues creatively by employing multiple systems and tools.

- **VALUES, ETHICS, RELATIONSHIPS / Professional/Personal Development:** Discern consequences of decisions and actions. Demonstrate intellectual agility and the ability to manage change.

- **VALUES, ETHICS, RELATIONSHIPS Ethics/values** Transform information into knowledge, and knowledge into judgment and actions.

Academic Integrity Policy:

Students and all others who work with information, ideas, images, music, inventions, and other intellectual property owe their audience and sources accuracy and honesty in using, crediting, and citing sources. As a community of intellectual and professional workers, the College recognizes its responsibility for providing instruction in information literacy and academic integrity. Accordingly, academic dishonesty is prohibited in The City University of New York and New York City College of Technology and is punishable by penalties, including failing grades, suspension, and expulsion. The complete text of the College policy an Academic Integrity may be found in the catalog.

Grading Procedure:

Final	35%
Exam 1	25%
Exam 2	25%
Class Work, Projects & Labs	15%
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TOTAL	100%

Letter Grade	A	A-	B+	B	B-	C+	C	D	F
Numerical Grade	93-100	90-92.9	87-89.9	83-86.9	80-82.9	77-79.9	70-76.9	60-69.9	0-59.9

Course Outline:

Week	Topic
1	**Introduction to Unix/Linux Operating Systems** **Getting Started with Fedora**
2	**Installing Linux**
3	**Unix/Linux Shell**
4	**Users and File Systems**
5	**Review and Test 1**
6	**How Linux Works / Desktop Environments**
7	**Processes / Linux Applications**
8	**System Initialization / Dual-Boot Systems**
9	**Review and Test 2**
10	**Package Management**
11	**Configuring and Administering Linux**
12	**Unix/Linux Networking**
13	**Setting up Network Services / Linux Kernel** **Test 3**
14	**Advanced Shell Usage and Shell Scripts**
15	**Final Projects & Review**
16	**Final Exam**

Assessment criteria:

For the successful completion of this course a student should be able to:	**Evaluation methods and criteria**
Demonstrate an understanding of the principles of System Administration, its goals and common practices	Students will demonstrate on exams their proper understanding of the principles of System Administration.

Demonstrate an understanding of major networking models, protocols, TCP/IP networks and related terminology	Students will demonstrate on homework and exams how familiar they are with network models and terminology.
Demonstrate practical skills in Unix/Linux installation and configuration	Students will demonstrate on homework projects, lab exercises and exams their ability to perform a Linux installation, and to configure the server environment.
Demonstrate an understanding of the Unix/Linux file system and management of data storage (disks)	Students will demonstrate on homework and lab exercises their knowledge of managing files, folders and disks.
Secure a Unix/Linux operating system and network, and implement use group policies	Students will demonstrate on homework and exams their knowledge of security setup and implementation of group policies.
Demonstrate an understanding of Linux networking and the tasks of server and network monitoring and troubleshooting; demonstrate skills in using related software tools	Students will demonstrate on exams and lab exercises their knowledge of server and network monitoring software tools in a Linux environment.
Install applications in a Linux environment	Students will demonstrate in lab projects the installation of Open-Office and other applications using RPM and apt.
Demonstrate an understanding of Unix/Linux shell and shell scripting	Students will demonstrate in the lab projects their understanding and ability to write shell scripts for operating system and administration purposes

General Education Outcomes and Assessment:

Learning Outcomes	**Assessment Method**
SKILLS/Inquiry/Analysis Students will employ scientific reasoning and logical thinking.	Through class work assignments, students will analyze system administration incidents.
SKILLS/Communication Students will communicate in diverse settings and groups, using written (both reading and writing), oral (both speaking and listening), and visual means	Presenting the admin policies they would select to solve specific business requirement
INTEGRATION/ Work productively within and across disciplines/Information literacies Gather, Interpret, evaluate, and apply information discerningly from a variety of sources.	Students will research, then select specific software application and deploy it in a multi-server environment.
INTEGRATION/ Work productively within and across disciplines /Systems	Students will have to create and use their own virtual system environment (lab project)

Students will **u**nderstand and navigate systems.	
INTEGRATION/ Work productively within and across disciplines Integrate learning Students will resolve difficult issues creatively by employing multiple systems and tools.	The test will include a problem situation that the students will have to address or/and correct (lab)
VALUES, ETHICS, RELATIONSHIPS / Professional/Personal Development: Discern consequences of decisions and actions. Demonstrate intellectual agility and the ability to manage change.	As a system administrator of their own system, students will tested under specific situation context.
VALUES, ETHICS, RELATIONSHIPS Ethics/values Transform information into knowledge, and knowledge into judgment and actions	Students will create management policies for the server and its users (lab project)