

NETWORK SYSTEMS ADMINISTRATION
Business/Public Service Division
GREENVILLE TECHNICAL COLLEGE
Greenville, South Carolina

COURSE SYLLABUS

Academic Year: 2009-10

Course Number: IST 191

Course Title: Linux System Administration

Lecture hours per week: 3.0 **Semester credit hours:** 3.0

Prerequisite: IST 190

Catalog Course Description: This course will provide students with the skills necessary to administer a Linux system including hardware/software configuration, user and group administration, Linux network configuration, and file system management.

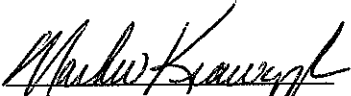
Purpose of the Course: Students will learn to install and configure Linux, manage the Linux filesystem, understand the Linux boot process, administer Linux users and groups, and become familiar with various Linux administrative tools.

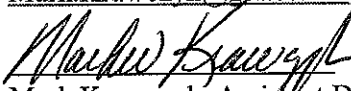
Required text(s) or other materials:

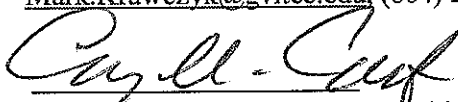
1. Lab Pack: Red Hat Academy RHA130 v5.0 Workbooks 1 through 10, published by the Red Hat Academy; only available through the Greenville Tech Bookstore or online in the Red Hat Academy.
2. All students must access CampusCruiser regarding final course grades/transcripts, information postings, financial records, etc. Students in traditional classes must access CampusCruiser for postings regarding assignments, grades, and e-mail. Students in online classes must access WebCT for specific course information regarding assignments and due dates, test dates, and e-mail correspondence; online courses require weekly participation.

Students for Whom the Course is Intended: For individuals, who design, implement, maintain, and administer Red Hat Enterprise Linux servers.

Approval Date: August 17, 2009

Approved by: 
Mark Krawczyk, Department Head, Network Systems Administration
Mark.Krawczyk@gvltec.edu, (864) 250-8404, Barton Campus, Building 103, Room 303

Approved by: 
Mark Krawczyk, Assistant Dean, Business
Mark.Krawczyk@gvltec.edu, (864) 250-8404, Barton Campus, Building 103, Room 303

Approved by: 
Carey Castle, Associate Vice President for Education for
Lenna C. Young, Dean, Business/Public Service
lenna.young@gvltec.edu, (864) 250-8204, Barton Campus, Building 103, Room 104

COLLEGE-WIDE GENERAL EDUCATION OUTCOMES

1. Communication – Students will demonstrate the ability to use active reading and listening skills and to produce effective written and oral communication for varying audiences.
2. Information Technology and Technological Literacy – Students will demonstrate competency in using computer technology within a field of study.
3. Critical Thinking/Reasoning – Students will demonstrate the ability to apply the scientific method, mathematical processes, and research skills to analyze and solve problems/issues by using reflection and reasoning to justify conclusions.
4. Professional and Personal Responsibility – Students will demonstrate the ability to exhibit conduct, attitudes, and etiquette appropriate to the student's community and chosen career. Students will demonstrate the ability to manage time, to use effective interpersonal skills, and to display responsible behavior.
5. Diversity – Students will demonstrate the ability to recognize diversity and to demonstrate respectful conduct and attitudes toward all. Students will demonstrate the ability to explain how global issues impact life, work, and opportunities.

Approved March 26, 2009

NETWORK SYSTEMS ADMINISTRATION - PROGRAM OUTCOMES

Upon successful completion of the Network Administration program, the graduate will be able to:

1. Set up, maintain, and troubleshoot computer and network hardware.
2. Install, maintain, and troubleshoot operating system and application software.
3. Construct and configure local area networks according to specification.
4. Administer and troubleshoot network operating systems.
5. Design and develop programming solutions to prescribed problems

Approved August 2009

IST 191 COURSE OUTCOMES

Students who successfully complete this course will have demonstrated a level of correct answers on the course assessment(s) that will be at least 80 percent for 80 percent of the course outcomes.

1. The student will be able to install Red Hat Enterprise Linux.
2. The student will be able to troubleshoot the Linux boot process.
3. The student will be able to add, modify, and delete Linux users and groups.
4. The student will be able to use Linux System Administration tools to administer a Linux server.
5. The student will be able to configure Linux kernel services.

The outcomes of the IST 191 course are intended to meet the Network Systems Administration program outcomes numbered 2 and 4 above.

Revised 1/2009

BUSINESS/PUBLIC SERVICE DIVISION POLICIES AND PROCEDURES

The following information is only a portion of the College's policies and procedures for which each student is responsible. For the most current information, please direct your attention to www.gvltec.edu for the most current *College Catalog and Student Handbook* information. The information is listed under *Current Student* and then under *Student Resources*.

BUSINESS/PUBLIC SERVICE DIVISION ATTENDANCE

Class attendance is necessary in order to receive maximum benefits from the educational program and achieve academic performance. It is the student's responsibility to attend class and to participate online by submitting work, e-mail, bulletin board postings, and turning in assignments, all in a timely manner. A student may be administratively withdrawn if more than 10 percent of the class hours, contact hours, or online participation is missed. The student is required to notify the instructor regarding reasons for absences prior to reaching the 10 percent limit. Faculty will make a reasonable attempt to notify students of the intent to withdraw administratively. Benefits and financial aid may be affected by a student's excessive absences. Students who are not administratively withdrawn may receive a final grade which will be noted with Student Records as "failed due to lack of attendance" which may also affect financial aid and other benefits.

Attendance in an online or hybrid course means having continuous communication with the instructor at a minimum of once per week of instruction. Online attendance and participation will be recorded on Sunday for the week preceding, and a student will be considered absent if no participation has been noted for that time. Access to an online or hybrid course does not count as "present." Attendance in hybrid courses includes both in class attendance and online participation.

WITHDRAWAL FROM CLASSES

If a student finds it necessary to withdraw from one or more classes, the student is responsible for completing the required paperwork for the withdrawal. The student must complete the required student update form and process it at the Office of Student Records located at the McAlister Square facility. Requests for withdrawal cannot be processed by an instructor or staff member. Failure for the student to process the paperwork will require a grade assignment at the end of the semester based on the portion of coursework completed.

ACADEMIC MISCONDUCT

All forms of academic misconduct including, but not limited to, cheating on tests, plagiarism, collusion, and falsification of information will call for discipline. Any student involved in any of these activities will, at a minimum, receive a grade of zero ("0") for that portion of the course and may, at the instructor's discretion, receive an "F" in the course.

1. **CHEATING** on tests is defined to include the following:
 - a) Copying from another student's test paper, answer sheet, or assignment.
 - b) Using materials or equipment during an assignment not authorized by the person giving it.
 - c) Collaborating with any other person during an assignment without permission.
 - d) Knowingly obtaining, using, buying, selling, transporting, or soliciting in whole or in part the contents of a test or assignment prior to its administration.

| |
|--|
| <p style="text-align:center">BUSINESS/PUBLIC SERVICE DIVISION POLICIES AND PROCEDURES</p> |
|--|

- e) Bribing or coercing any other person to obtain tests, assignments, or information about them.
- f) Substituting for another student, or permitting any other person to substitute for oneself.
- g) Cooperating or aiding in any of the above.
- 2. **PLAGIARISM** is defined as the appropriation of any other person's work and the unacknowledged incorporation of that work in one's own work.
- 3. **Collusion** means knowingly assisting another person in an act of academic dishonesty.
- 4. **Fabrication** is defined as falsifying or inventing information in such academic exercises as reports, laboratory results, and citation to the courses of information.

Falsification of information, and other unlawful acts, with intent to deceive is defined as:

- 1. Forgery, alteration, or misuse of college documents, records, or identification cards.
- 2. Destruction of evidence with the intent to deny its presentation to the appropriate hearing or appeals panel when properly notified to appear.

CLASSROOM CONDUCT

It must be assumed by all students that classroom conduct and manners are founded in courtesy and respect for others. Discussion and expression of all views relevant to the subject matter are recognized as necessary to the education process, but students have no right to interfere with the freedom of instructors to teach or the rights of other students to learn. The instructor sets the standards of acceptable behavior for their classroom and their online bulletin board participation. Unacceptable behavior will not be tolerated and could result in dismissal from the class as outlined in the *College Catalog/Student Handbook*.

POLICY FOR USE OF CELL PHONES AND OTHER PERSONAL ELECTRONIC DEVICES

The use of cell phones, pagers, and other personal electronic devices is allowed on all Greenville Technical College campuses; however, users of these devices must be attentive to the needs, sensibilities, and rights of other members of the College community.

To avoid any unnecessary disruption of College functions, these devices must be turned off and placed out of sight in all academic settings including classrooms, laboratories, clinical/externship settings, study spaces, and computer labs. These devices should not be used near classroom doors or hallways while classes are in session. Students participating in off-campus course related activities must follow the electronic devices' policies of the agency or organization where they are visiting or working.

If an extenuating circumstance exists so that an electronic device is required, the student must seek the instructor's permission in advance of class to use the device, and the device must be set to silent / vibrate mode. The student is responsible for materials missed during his or her absence while using the device.

Beyond the basic College policy stated herein, departments or faculty members, at their discretion, may formulate more restrictive policies related to personal electronic devices. This provision is intended to provide and maintain a classroom environment that is conducive to learning and respectful of others. Any additional policies must be stated in the course syllabi and may include penalties for student violation.

| |
|--|
| <p style="text-align:center">BUSINESS/PUBLIC SERVICE DIVISION POLICIES AND PROCEDURES</p> |
|--|

Disruption of class by any electronic device may result in an instructor's dismissal of the student for the remainder of the class period. Other specified procedures for disruptive classroom behavior may apply as well. If any personal electronic device is used inappropriately for the purpose of academic dishonesty, the student will be penalized appropriately under the Academic Honesty Policy of Greenville Technical College.

POLICY FOR REPEATING A COURSE

A student may register for a class a maximum of three times including withdrawals. There is an appeal process for extenuating circumstances.

COUNSELING SERVICES

A counselor is available to assist students with personal, academic, or career counseling. Gina Power is the counselor for the Business/Public Service Division. Her office is located on the Barton Campus in Building 122, Room 247. You may reach Ms. Power by phone at 250-8157 or by e-mail at gina.power@gvltec.edu.

STUDENT WITH DISABILITIES

All students who have a disability and need accommodations should visit, call, or e-mail the Student Disability Services Office at the beginning of each semester. Students are strongly encouraged to obtain their accommodation forms within the first 2 weeks of class to ensure appropriate services. The office is located at the Barton Campus in the University Transfer Building (#104), Room 137A, and can be reached by phone at 250-8202 or 250-8408 or by e-mail at sharon.bellwood@gvltec.edu. The Disability Service Counselor is available to meet with students on satellite campuses by appointment.

COMPUTER USAGE AND LAB RULES STATEMENT

Computer facilities are provided to support the mission of the College, and student access is provided only for uses associated with a course of study and activities related to that course. Non-college related purposes are prohibited. All who use computing facilities agree to do so in a manner which is ethical, legal, and does not interfere with others. Students' children are not allowed in computer labs or classrooms, nor are they allowed to be left unattended on campus. Food and drinks are prohibited in computer labs and classrooms. Students must be aware of, and adhere to, the laws related to software copyrights and licensing. Students may not attempt to interfere with the operation of, or attempt to circumvent the security of, any of the College's computing facilities. Students may not use the College's computing facilities to send, receive, or access material that is deemed to be obscene, offensive, or harassing to others. The college reserves the right to determine if a particular source of information may contain such information and to restrict or deny access to such sources at its discretion.

Additional information on computing specifics is outlined in the *College Catalog and Student Handbook*. Departments may also post additional requirements specific to their computer labs for which the student will also be required to adhere.

| |
|--|
| Academic Calendar 2009-2010 Academic Year |
|--|

Fall 2009

| | | |
|----|--|--|
| | 9-Month Employment Period Begins (W) | August 12, 2009 |
| NT | Faculty Work Days (W-F) | August 12-14, 2009 |
| | Fall Classes Begin (M) | August 17, 2009 |
| H | Labor Day Holiday (M) | September 7, 2009 |
| | Classes Begin for 10-Week Session (T) | September 22, 2009 |
| | Students' Last Day to Withdraw from 1 st Half (W) | September 23, 2009 |
| | Last Class Day for 1 st Half Term (W) | October 7, 2009 |
| | Exams for 1 st Half Term (R-F) | October 8-9, 2009 |
| | Classes Begin for 2 nd Half Term (M) | October 12, 2009 |
| | Students' Last Day to Withdraw from Full Term (M) | October 26, 2009 |
| | Students' Last Day to Withdraw from 10-Week Session (F) | November 6, 2009 |
| | Students' Last Day to Withdraw from 2 nd Half (T) | November 17, 2009 |
| H | Thanksgiving Holidays (W-F) | November 25-27, 2009 |
| | Last Day of Class for Full Term, 2 nd Half, and 10-Week (R) | December 3, 2009 |
| NT | Faculty Work Day | December 4, 2009 |
| | Exams (M-R) | December 7-10, 2009 |
| NT | Faculty Work Days (F, M-W) | December 11, 14-16, 2009 |
| H | Christmas Holidays (R-F) | December 17, 2009 – January 1, 2010 |

Spring 2010

| | | |
|----|--|--------------------------|
| | Faculty Work Days (M-F) | January 4-8, 2010 |
| NT | Spring Classes Begin (M) | January 11, 2010 |
| H | Martin Luther King's Birthday (M) | January 18, 2010 |
| | Classes Begin for 10-Week Session (T) | February 16, 2010 |
| | Students' Last Day to Withdraw from 1 st Half (W) | February 17, 2010 |
| | Last Class Day for 1 st Half Term (W) | March 3, 2010 |
| | Exams for 1 st Half Term (R-F) | March 4-5, 2010 |
| | Classes Begin for 2 nd Half Term (M) | March 8, 2010 |
| | Students' Last Day to Withdraw from Full Term (M) | March 22, 2010 |
| H | Spring Break (M-F) | March 29 - April 2, 2010 |
| | Students' Last Day to Withdraw from 10-Week Session (F) | April 9, 2010 |
| | Students' Last Day to Withdraw from 2 nd Half (T) | April 20, 2010 |
| | Last Day of Class for Full Term, 2 nd Half, and 10-Week (M) | May 3, 2010 |
| | Exams (T-F) | May 4-7, 2010 |
| NT | Faculty Work Days (M-T) | May 10-11, 2010 |
| | Graduation (T) | May 11, 2010 |
| | End of 9-Month Employment Period (T) | May 11, 2010 |

Summer 2010

| | | |
|----|--|-----------------------|
| | Summer Employment Period Begins (W) | May 12, 2010 |
| NT | Faculty Work Days (W-F) | May 12-14, 2010 |
| | Summer Classes Begin (M) | May 17, 2010 |
| NT | Memorial Day – Student Holiday/Faculty Workday (M) | May 31, 2010 |
| | Students' Last Day to Withdraw from 1 st Half (W) | June 9, 2010 |
| | Last Class Day for 1 st Half Term (F) | June 18, 2010 |
| | Exams for 1 st Half Term (M-T) | June 21-22, 2010 |
| | Classes Begin for 2 nd Half Term (W) | June 23, 2010 |
| | Students' Last Day to Withdraw from Full Term (M) | July 12, 2010 |
| H | Independence Day Holidays (M-F) | July 5 – July 9, 2010 |
| | Students' Last Day to Withdraw from 2 nd Half (R) | July 22, 2010 |
| | Last Day of Class for Full Term and 2 nd Half (M) | August 2, 2010 |
| | Exams (T-R) | August 3-5, 2010 |
| NT | Faculty Work Days (F, M-T) | August 6, 9-10, 2010 |
| | End of Summer Employment Period (T) | August 10, 2010 |

IST 191 – Linux System Administration

The Red Hat Academy curriculum is available at the website academy.redhat.com. The text is a printed version of the online curriculum. The online curriculum and tests can be accessed with your user name and password. To receive full benefit from the online curriculum, be sure to visit links recommended.

Grading Policy

A numeric grade will be given for each of the following items:

| | |
|--|-------------------|
| Workbook Tests (Red Hat Online Tests) | 50 percent |
| Labs | 15 percent |
| Workbook Assignments | 10 percent |
| Final Examination | 25 percent |

(Written Final Exam 65% and Skill-Based Assessment 35%)

Notebooks should be maintained containing notes from the Red Hat curriculum, the text, lectures, and labs.

There are 11 online tests. The tests are intended for the Red Hat Certified Technician (RHCT) exam preparation. The final exam will consist of a written assessment and a skill-based assessment.

Departmental Policy for the Submission and Grading of Assignments

- All assignments (i.e., labs, projects, research papers, etc.) for this course must be completed and submitted to the instructor by the due date established in order to receive full credit for the assignment.
- Assignments not submitted by the due date can receive up to a maximum of 80 percent credit if it is submitted within one week of the due date.
- Assignments submitted after one week of the due date will have a zero (0) grade recorded for the assignment.
- In the event that an assignment is made less than one week prior to the end of the course, the assignment must be submitted by the last day of class prior to the beginning of the final exam period and will not be accepted late.

Departmental Test Policy for Computer Technology Courses

- A minimum of three (3) tests and a Comprehensive Final Exam will be given.
- Test dates will be announced in class and posted on CampusCruiser or WebCT.
- Periodic announced and unannounced quizzes may be given to encourage attendance; make-ups are not allowed.
- The student assumes responsibility for materials and announcements missed when absent.
- **Tests must be taken on the announced day. Early tests may be arranged at the instructor's discretion.**
- **Only one make-up test without bonus options is allowed for the course; scheduling of the make-up test is at the instructor's discretion. If the first missed test is prior to the last date to withdraw for the course, the test must be completed prior to the withdrawal date. Bonus options will not be allowed on the make-up test. If a second test is missed, the student will automatically receive a failing grade for the course.**
- A failing grade will be given if two or more tests are missed.
- A comprehensive final exam must be taken as scheduled with no exemptions or exceptions.

Exceptions to the Departmental Test Policy will be made on an individual basis as a result of a decision involving the department head, instructor, student, and/or the Assistant Dean.

Departmental Academic Honesty Policy for Cheating and Plagiarism

Cheating and Plagiarism will not be tolerated in any Computer Technology course. If cheating and/or plagiarism are found, the following grading penalty will be assessed:

1st Offense – A grade of zero (0) will be assessed for the assignment/test on which the incident occurred.

2nd Offense – A grade of zero (0) will be assessed for the entire assignment/test portion for the course in which the incident occurred.

For this course the penalty would be 15 percent of the final grade for labs, 10 percent of the final grade for assignments, and 50 percent of the final grade for tests.

Departmental Grading Scale

Final letter grades will be issued as follows:

| | | |
|---|---|-----------------|
| A | = | 90 - 100 points |
| B | = | 80 - 89 points |
| C | = | 70 - 79 points |
| D | = | 60 - 69 points |
| F | = | 0 - 59 points |

INCOMPLETES: An INCOMPLETE ("I") will only be approved if ALL of the following conditions exist:

- The student must have no more than 3 weeks (15-week term) or 1.5 weeks (8-week/10-week term) remaining to complete the course.
- The student must have a validated, documented reason why he/she cannot complete the course by the prescribed end date (illness, work situation, death, etc.).
- The student must be up to date with all work up to the point of the request for an Incomplete (no untaken tests or un-submitted labs, homework, etc.), and the student must have a passing grade average (C or higher) for all work submitted.

IST 191 – Linux System Administration
Tentative Schedule of Topic and Class/Lab Meetings

The following is a tentative schedule for the course. The instructor reserves the right to make schedule changes based on the needs of the students in the class.

Tutoring is now available in the Business Division Student Lab located on the Barton Campus in the Engineering Building (#103), Room 115. The hours for tutoring are posted in the lab (ET 115); no appointment is necessary. There are no fees required for this service.

Introduction to Course (Curriculum Tour)

Workbook 1 – Red Hat Enterprise Linux Installation

Anaconda

Network Based Installations

Using Kickstart to Automate Installations

Workbook 2 – Hardware and Device Configuration

Installing Various Devices

Performance Monitoring

Workbook 1 Test

Workbook 3 – Linux Filesystem Management

Disk Recognition and Partitioning

Creating and Managing Filesystems

SELinux: Secure Linux

Workbook 2 Test

Finish Workbook 3

Workbook 4 – System Initialization and Services

The Boot Sequence and the GRUB Bootloader

Linux Run Levels

Workbook 3 Test

Workbook 5 – User and Group Administration

Adding, Modifying, and Deleting Users

Managing Passwords

Adding, Modifying, and Deleting Groups

Workbook 4 Test

Workbook 6 – Network Configuration

Managing Network Interfaces

Basic IP Routing and Gateways

Workbook 5 Test

Workbook 7 – System Administration Tools

The CUPS Print System

System Logging

Automated System Maintenance

Workbook 6 Test

IST 191 – Linux System Administration
Tentative Schedule of Topic and Class/Lab Meetings

Finish Workbook 7

Workbook 8 – The Red Hat Package Manager

RPM: Installing and Removing Software

RPM Queries and Verification

Workbook 7 Test

Workbook 9 – Kernel Services and Configuration

Kernel Modules and Updating Kernels

The Network File System (NFS)

The Automounter

Software RAID

Workbook 8 Test

Finish Workbook 9

Workbook 10 – The X Windowing System

X Server Configuration

X Startup Configuration

Workbook 9 Test

Finish Workbook 10

Prepare for Final Exam

Workbook 10 Test

FINAL WRITTEN EXAM – COMPREHENSIVE – COVERS ALL WORKBOOKS AND LECTURES

FINAL HANDS-ON SKILLS-BASED EXAM – COVERS ALL HANDS-ON LAB MATERIAL