

COMPUTER TECHNOLOGY DEPARTMENT

GREENVILLE TECHNICAL COLLEGE
Greenville, South Carolina

COURSE SYLLABUS

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 RH130 Workbooks 1 through 11, 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.

Instructor: _____

Telephone Ext: _____

Office Location: _____

Office Hours: _____

Approved by: Mark Krawczyk

Date: August 18, 2008

Mark Krawczyk

Computer Technology/Networking Department Head

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Approved by: Susan McDonald

Date: August 18, 2008

Susan McDonald

Dean of Technical Business

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COLLEGE OF TECHNICAL BUSINESS STUDENT/INSTRUCTION POLICY AGREEMENT

The following policy information is provided in expanded text in the document entitled *College of Technical Business Policies and Procedures* provided to you in a separate document via *CampusCruiser*. Although the following information is in an abbreviated form, students are responsible for knowing the policies and any procedures related to the policies in their entirety. The policies and procedures are also provided in the current *College Catalog and Student Handbook* as indicated, and additional information may also be found on the College's website, www.gvltec.edu.

TECHNICAL BUSINESS DIVISION ATTENDANCE POLICIES

TRADITIONAL CLASSES: It is the student's responsibility to be present for all scheduled classes and labs and to communicate with instructors regarding absences. Any student missing more than 10 percent of the class meetings may be administratively withdrawn by the instructor.

ONLINE CLASSES: It is the student's responsibility to commit themselves to online classes and participate regularly, i.e., continuous communication with the instructor by e-mail, bulletin board postings, and turning in assignments. Students who stop sending weekly e-mails, or bulletin board postings and/or stop submitting work will be assumed as not "attending" class and will be marked absent. Consistent absences will make a student eligible for being withdrawn from the course or denied access to the course. Students who find him/herself falling behind should contact the instructor. In other words, if a student simply accesses the course but doesn't communicate, then it doesn't count as "attendance;" and if the student does not withdraw, he/she may receive a final grade of "FA," meaning "failed due to lack of attendance." Such a grade can affect a student's financial aid status.

WITHDRAWAL FROM CLASSES

It is the student's responsibility to complete the required paperwork and process it at the Office of Student Records located at the McAlister Square facility. Instructors or staff members will not process course withdrawal requests.

CLASSROOM CONDUCT *Refer to the College Catalog/Student Handbook, pages 63-73, for additional information.*

Classroom conduct and manners are founded in courtesy and respect for others. Conduct that interferes with the freedom of instructors to teach and the rights of other students to learn is not acceptable and could result in dismissal from the class.

CELL PHONES AND OTHER PERSONAL ELECTRONIC DEVICES

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 and should not be used near classroom doors or hallways while classes are in session. If a circumstance exists that makes a device required, the student must seek the instructor's permission in advance and it must be set to silent/vibrate mode. Disruption of class from electronic devices may result in the student's dismissal from the class. Issues related to academic dishonesty using these devices will follow the Academic Honesty Policy.

ACADEMIC HONESTY *Refer to the College Catalog/Student Handbook, pages 12 and 66, for additional information.*

Students should know what activities constitute cheating, plagiarism, and collusion as defined in the Student Code for South Carolina Technical Colleges. A student involved in any of these activities will, at a minimum, receive a grade of "0" for that portion of the course. This grade will be computed in the final course grade. **Note: Refer to the Department Academic Honesty Policy under the Grading Information for specific information.**

POLICY FOR REPEATING A COURSE *Refer to the College Catalog/Student Handbook, page 17, for additional information.*

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

COUNSELING SERVICES *Refer to the College Catalog/Student Handbook, page 48, for additional information.*

Counselors are available to assist Technical Business students with personal, academic, or career counseling. Counselor information is posted at the Barton Campus in the Engineering Technology Building (#103), Room 119. If you are not on the Barton Campus, you may call the Technical Business Dean's Office at 250-8196 or e-mail ginamarie.thomas@gvltec.edu for counselor information and assistance. In addition the College has an Intervention Counseling Office which offers confidential professional counseling as well as resources and referrals to agencies. This office is located at the Barton Campus in the Student Center (Building 105), Room 140. Jackie Bradham, counseling, can be reached by phone at 250-8176 or 250-8318 or by e-mail at jackie.bradham@gvltec.edu. Appointments can be scheduled as needed.

STUDENT WITH DISABILITIES *Refer to the College Catalog/Student Handbook, page 48, for additional information.*

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 Student Center (Building 105), Room 124, 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.

The above 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 student handbook information. The information is listed under *Current Student* and then under *Student Resources*.

CPT/NETWORK ADMINISTRATION PROGRAM COMPETENCIES

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

1. Demonstrate the knowledge and ability to evaluate, configure, maintain, and troubleshoot microcomputer hardware and software.
2. Demonstrate an understanding of data communication concepts, network devices, network operating systems, network cabling, and LAN topologies.
3. Demonstrate the knowledge and skills necessary to install, configure, and maintain network operating systems such as Windows and Unix.
4. Demonstrate the knowledge and skills necessary to interconnect various network devices to include routers, switches, hubs, and workstations.
5. Demonstrate the skills needed to effectively administer a Windows local area network to include the set up of users, groups, shares, permissions, and print sharing.
6. Demonstrate an understanding of network security concepts and technologies to include authentication, network security topologies, and devices and encryption methods.
7. Demonstrate the knowledge and skills necessary to secure a network to include configuring software and hardware solutions.
8. Demonstrate the knowledge and skills necessary to implement a wireless network to include an understanding of current standards and technologies.
9. Demonstrate the ability to take initiative, assume responsibility, and work under pressure with minimum supervision by successfully completing "hands-on" lab assignments.
10. Demonstrate the use of a minimum of three business application software packages.
11. Design, create, test, and document the logical programming solution to prescribed specifications following established standards and using programming languages.

IST 191 TERMINAL OBJECTIVES

Students who successfully complete this course will have demonstrated the skills necessary to accomplish the following objectives with a minimum competency of 70 percent.

1. Demonstrate the skills necessary to install Red Hat Enterprise Linux.
2. Demonstrate an understanding of the Linux boot process.
3. Develop an understanding of how to add, modify, and delete Linux users and groups.
4. Demonstrate Linux network configuration skills.
5. Develop the skills to use Linux System Administration Tools and administer a Linux server.
6. Develop an understanding of how to use the Red Hat Package Manager to manage software applications in Linux.
7. Demonstrate an understanding of Linux kernel services and configuration.
8. Develop the skills needed to administer the X Windowing System.
9. Demonstrate an understanding of basic Red Hat Enterprise Linux troubleshooting skills.

The objectives of the IST 191 course are intended to meet the CPT/Networking Administration program competencies numbered 2, 3, 7, and 9 above.

Business Division Student Lab Rules

The following lab rules are in addition to those mandated by the College as outlined in the Computing Facilities Use Policy (*College Catalog/Student Handbook, pages 62-63*). By signing the Syllabus Acknowledgement Form for this course, you agree to follow all of the guidelines specified by both the College and the Division. Failure to comply with all computer policies will result in the loss of privileges involving campus computer facilities.

- Children are **not** allowed in labs and classrooms nor left in hallways (*College Catalog/Student Handbook, page 62*).
- Food and drinks are **not** allowed in computer labs.
- Labs are to be used only for students enrolled in Computer/Business Program courses and for educational purposes only and may not be used for commercial or personal purposes.
- A Student ID is required. You may be asked to show your student ID and also a copy of your current class schedule.
- **You must log into the computer when you arrive. You will enter your first and last names and your CampusCruiser ID. You will then receive a listing of courses for the current semester, and you will need to select the course for which you are completing work. Remember to log out of the computer before you leave the computer and the lab.**
- Inappropriate or unethical use of the Internet is strictly prohibited (i.e., chat rooms, pornographic web site access, etc.) On the first offense, a written warning will be issued. Lab privileges will be revoked upon the second offense.
- **Internet downloading is prohibited!**
- **Printing in the Business Division Student Lab is now available.** Students will need to purchase a pay-to-print card (a machine is located in the lab), and the student will be charged per page for printing. Printing from the Internet is allowed; however, all regulations regarding the use of the Internet also apply to printing from the Internet.
- Printing in the lab classrooms may only be done at the request of the instructor during class time. Then only one copy of the final assignment may be printed for submission. No other printing is permitted in these labs.
- Lab assistants are on duty to handle hardware/software problems; they do not provide tutoring.
- The Lab Assistant's office and telephone are not to be used by students; a pay phone is located in the canteen.
- All equipment malfunctions are to be reported to the lab assistant; do not attempt repairs.
- Labs are **closed** to all students **during exam days** (except for scheduled exam use), **holiday breaks**, and **between semesters**.
- **Loading of ANY software onto campus computers is prohibited.**
- Copying of any software programs and applications which are licensed or protected by copyright is theft.
- Copying of computer programs, documents, spreadsheets, databases, presentations, computer codes, etc. is not tolerated.
- You must keep the labs neat and clean by picking up after yourself.
- Labs are occasionally reserved for classes; adhere to posted signs.
- **You must leave the lab and/or classroom to answer or return cell phone calls. Please put your cell phone on manner-mode or vibrate when in the lab and/or classroom; disruptive and loud ring tones are not acceptable. Students may be asked to change inappropriate ring tones that are disruptive to the learning environment in the lab and/or classroom.**
- **Use of personal laptops is not permitted in the lab.** Only computers owned by the College may be plugged into any College network.
- Instant messaging is prohibited.
- All students must use the Business Division Student Lab to complete work outside of the scheduled course times. Students will not be allowed to remain in the classroom to complete work after the class is over. Instructors will ask all students to leave the classroom and report to the Student Lab if they desire to continue working on a computer.

The Business Division Student Lab is located on the Barton Campus in the Engineering Building (103), Rooms 113 and 115.

Be sure to keep your student ID and class schedule with you; you may be asked to show your current student ID and/or your current class schedule.

*Lab Hours: Monday – Friday 8:00 am to 9:30 pm ▪ Saturday 8:00 am to 1:00 pm ▪ Sunday Closed

Addendum to Business Division Student Lab Rules Applicable for all Networking Courses

Due to the setup required in a hands-on environment, the lab that this class is assigned to has no or little security parameters associated with it. This computer lab is defined in this manner so that students can perform lab assignments and extracurricular training without interference from NT's rich set of security parameters.

The following rules have been added to this Networking class/lab:

- 1) Students are not to enter nor make changes to any other student's computer or partition by any means unless asked to do so by the instructor as a class exercise/lab. This means that entry cannot be made directly or through the lab network.
- 2) Students are not allowed to install any software on any computer unless explicitly advised to do so by the instructor.
- 3) Students are not to alter the boot.ini file even if it exists in the student's partition.
- 4) Students are not to use the instructor's computer nor attach to it through the network unless explicitly advised to do so by the instructor.

Failure to follow the above rules will result in a loss of 10 percent of the final grade upon a first offense. A second offense will result in a grade of an 'F' for the semester.

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*.
- 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 Dean of Technical Business.

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.

Week 1	Introduction to Course (Curriculum Tour) <u>Workbook 1 – Red Hat Enterprise Linux Installation</u> Anaconda Network Based Installations Using Kickstart to Automate Installations
Week 2	<u>Workbook 2 – Hardware and Device Configuration</u> Installing Various Devices Performance Monitoring Workbook 1 Test
Week 3	<u>Workbook 3 – Linux Filesystem Management</u> Disk Recognition and Partitioning Creating and Managing Filesystems SELinux: Secure Linux Workbook 2 Test
Week 4	Finish Workbook 3
Week 5	<u>Workbook 4 – System Initialization and Services</u> The Boot Sequence and the GRUB Bootloader Linux Run Levels Workbook 3 Test
Week 6	<u>Workbook 5 – User and Group Administration</u> Adding, Modifying, and Deleting Users Managing Passwords Adding, Modifying, and Deleting Groups Workbook 4 Test
Week 7	<u>Workbook 6 – Network Configuration</u> Managing Network Interfaces Basic IP Routing and Gateways Workbook 5 Test
Week 8	<u>Workbook 7 – System Administration Tools</u> 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

- Week 9** Finish Workbook 7
- Week 10** Workbook 8 – The Red Hat Package Manager
 RPM: Installing and Removing Software
 RPM Queries and Verification
Workbook 7 Test
- Week 11** Workbook 9 – Kernel Services and Configuration
 Kernel Modules and Updating Kernels
 The Network File System (NFS)
 The Automounter
 Software RAID
Workbook 8 Test
- Week 12** Workbook 10 – The X Windowing System
 X Server Configuration
 X Startup Configuration
Workbook 9 Test
- Week 13** Finish Workbook 10
- Week 14** Workbook 11 – Troubleshooting
 Things to Check
 Recovering Systems Using the Rescue Environment
Workbook 10 Test
- Week 15** Prepare for Final Exam
Workbook 11 Test

FINAL WRITTEN EXAM – COMPREHENSIVE – COVERS ALL WORKBOOKS AND LECTURES
FINAL HANDS-ON SKILLS-BASED EXAM – COVERS ALL HANDS-ON LAB MATERIAL