

GREENVILLE TECHNICAL COLLEGE

Business and Technology Division Computer Technology Department Course Syllabus

IST 191: Linux Systems Administration Fall 2018 Catalog Year

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Credit/Contact Hours:

3.0

Prerequisite:

IST 190. Computer Technology students must obtain a minimum grade of "C" in all CPT and IST courses.

Co-requisite:

None

Course Description:

This course will provide students with the skills necessary to manage Linux servers including installation, automated installation, using regular expression, managing future tasks, managing users and groups, managing Linux storage systems, securing a Linux server with ACLs, SELinux, and firewalld. Students will learn how to administer the core

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network services in a Linux system, such as Apache Web Server, Samba File Server, Postfix email server, and other network services.

Purpose of Course:

Students will learn skills necessary to manage Linux servers including installation, automated installation, using regular expression, managing future tasks, managing users and groups, managing Linux storage systems, securing a Linux server with ACLs, SELinux, and firewalld. Students will also learn how to administer the core network services in a Linux system, such as Apache Web Server, Samba File Server, Postfix email server, and other network services.

Required Texts:

1. RHCSA/RHCE Red Hat® Linux® Certification Study Guide, Seventh Edition (Exams EX200 & EX300)
 - Michael Jang and Alessandro Orsaria
 - Copyright © 2016 by McGraw Hill Education
 - ISBN: 978-0-07-184196-2 (book with DVD)
2. The CPT Department at Greenville Technical College is a member of the Red Hat Academy. The curriculum content for IST 191 will be delivered online via the Red Hat Academy. Students in IST 191 will be given access to the online curriculum. Internet access is required for a student in IST 191 to complete this course. There are no other required textbooks. The Red Hat Academy is online at <https://rhlearn.gilmore.ca>.
3. NOTE: Students in traditional classes must access Blackboard for course-related information. Students in hybrid and online classes will access their online content through Blackboard.

Additional Materials, Supplies, Equipment, and Technology:

The skills taught in this course are applicable to a wide range of careers including Linux system administration, network administration, and network security. This course will provide students with an advanced understanding of the Red Hat distribution fork of Linux, including Fedora, Red Hat Enterprise Linux (RHEL) and CentOS Linux (Community ENTerprise Operating System). IST 191 is not a computer certification course, but students will gain training that will help them pass the CompTIA Linux+, Linux Professional Institute LPIC1 and LPIC2, the Red Hat Certified System Administrator (RHCSA), and the Red Hat Certified Engineer (RHCE) certification exams. The final exam will consist of a written assessment and a skill-based hands-on assessment.

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Additional recommended reference books on Red Hat Linux are posted online at <https://beausanders.org/IST191>.

Blackboard portal website via gvltec.edu:

- Students in traditional classes must access Blackboard for course-related information.
- Students in blended classes will access their online content through Blackboard.

Instructional Agreement:

This syllabus is an agreement between the student and instructor concerning course objectives, course content, grading, and other policies and procedures particular to the course as well as any posted program, departmental, and divisional policies. It is also the student's responsibility to become familiar with the Student Handbook/College Catalog found in the Student Resources area of Blackboard.

Greenville Technical College Core Competencies:

Communication Core Competency: Students will demonstrate effective written and oral communication skills to convey information, ideas, or opinions.

- Written Communication: Students will demonstrate effective written communication skills to convey information, ideas, or opinions.
- Oral Communication: Students will demonstrate effective oral communication skills to convey information, ideas, or opinions.

Critical Thinking Core Competency: Students will demonstrate effective reasoning, problem solving, or quantitative skills to develop an opinion or conclusion.

- Critical Reasoning: Students will employ inquiry, analysis, and synthesis of information to formulate and/or evaluate an opinion or conclusion.
- Problem Reasoning: Students will design and formulate a strategy to answer a question or achieve a desired goal.
- Quantitative Reasoning: Students will be able to analyze numerical information or observable facts resulting in informed conclusions.

Information Literacy Core Competency: Students will be able to locate, evaluate, and use information effectively from diverse sources.

Professionalism Core Competency: Students will demonstrate conduct and etiquette appropriate to the community and chosen career.

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- Professionalism: Students will display professional conduct and work habits.
- Teamwork: Students will collaborate with others to accomplish a shared goal.

Program Student Learning Outcomes:

Upon successful completion of the Computer Technology Degree students will be able to:

1. Install computer and network hardware.
2. Install computer operating systems and application software.
3. Design, create and test computer programming solutions.
4. Demonstrate the ability to take initiative, assume responsibility, and work under pressure with minimum supervision by successfully completing "hands-on" computer assignments.
5. Analyze, troubleshoot, and correct computer related technical problems.

Course Outcomes:

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

1. Administer Linux users and groups.
2. Install, configure, and administer Apache Web Server.
3. Install, configure, and administer Samba (SMB File Server).
4. Install, configure, and administer Postfix E-mail Server.
5. Manage and secure a Linux server using basic administrative skills, network applications, and open source tools.

Revised June 2016

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Course Content:

Please refer to Syllabus Addendum in Blackboard to review the Tentative Course Schedule. Your instructor will provide a detailed, week-by-week plan of instruction along with method of delivery, testing, and assignment submission.

COURSE OUTLINE (Units)

1. Automating Installation with Kickstart
 - Defining the Anaconda Kickstart System
 - Deploying a New Virtual System with Kickstart
2. Using Regular Expressions with grep
 - Regular Expressions Fundamentals
 - Matching Text with grep
3. Creating and Editing Text Files with vim
 - The vim Text Editor
 - Basic vim Workflow
 - Editing with vim
4. Scheduling Future Linux Tasks
 - Scheduling One-Time Tasks with the at daemon
 - Scheduling Recurring Jobs with the cron daemon
 - Scheduling System cron Jobs
 - Managing Temporary Files
5. Managing Priority of Linux Processes
 - Process Priority and "nice" Concepts
 - Using nice and renice to Influence Process Priority
6. Controlling Access to Files with Access Control Lists (ACLs)
 - POSIX Access Control Lists (ACLs)
 - Securing Files with ACLs
7. Managing SELinux Security
 - Enabling and Monitoring Security Enhanced Linux (SELinux)
 - Changing SELinux Modes
 - Changing SELinux Contexts
 - Changing SELinux Booleans

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- Troubleshooting SELinux
- 8. Connecting to Network-defined Users and Groups
 - Using Identity Management Services
- 9. Adding Disks, Partitions, and File Systems to a Linux System
 - Adding Partitions, File Systems, and Persistent Mounts
 - Managing Swap Space
- 10. Managing Logical Volume Management (LVM) Storage
 - Logical Volume Management Concepts
 - Managing Logical Volumes
 - Extending Logical Volumes
- 11. Accessing Network Storage with Network File System (NFS)
 - Storage with NFS
 - Automounting Network Storage with NFS
- 12. Accessing Network Storage with SMB
 - Install, configure, and administer Samba (SMB File Server)
 - Accessing Network Storage with SMB
- 13. Controlling and Troubleshooting the RHEL Boot Process
 - The Red Hat Enterprise Linux Boot Process
 - Repairing Common Boot Issues
 - Repairing File System Issues at Boot
 - Repairing Boot Loader Issues
- 14. Limiting Network Communication with firewalld
 - Limiting Network Communication
- 15. Additional Topics
 - Administer Linux users and groups
 - Install, configure, and administer Apache Web Server
 - Install, configure, and administer Samba (SMB File Server)
 - Install, configure, and administer Postfix E-mail Server

The instructor reserves the right to modify the Plan of Instruction by changing the sequence of text material or testing content.

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The final examination for traditional, online, hybrid, and blended class students will be administered on the Barton Campus. The final examination will be scheduled at a time determined by the administration.

Revised August 2018

Course Policies:

Computer Technology students must obtain a minimum grade of "C" in all CPT and IST courses.

Please refer to Departmental Policies in Blackboard to review additional course and department policies.

Revised August 2018

Grading Scale:

Weighted Percentages:

Grades for this course will be calculated as follows:

| | |
|-------------|------------|
| Unit Tests | 35 percent |
| Assignments | 15 percent |
| Labs | 20 percent |
| Final Exam | 30 percent |

Written Final Exam 35% and Hands-On Lab Final Exam 65%

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Final letter grades will be issued as follows:

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

Revised August 2018

Students with Disabilities:

Students with disabilities, including those who were served in Special Education (resource or tutorial), should contact Student Disability Services (SDS) to discuss their need for services and accommodations. The main SDS office is located on the Barton Campus in the Student Center Building 105, office 113.

Staff can be reached by phone at (864) 250-8202 or via email to DisabilityServices@gvltec.edu. Appointments are available at all satellite campus locations. Please check the GTC website for more information concerning [Student Disability Services](http://gvltec.edu/disability-services/) (<http://gvltec.edu/disability-services/>).

Efforts have been made to ensure all materials presented in an electronic format are accessible for students with disabilities, and the college is committed to this obligation. However, if you experience any difficulty accessing these materials, please notify your instructor immediately so a solution can be provided. You may also contact Student Disability Services directly at (864) 250-8202 or by email at DisabilityServices@gvltec.edu.

Students who need a PDF reader for accessibility of course documents presented in PDF format may [download Adobe Reader](https://get.adobe.com/reader/) (<https://get.adobe.com/reader/>).

Nondiscrimination Statement:

Greenville Technical College provides equal opportunity and affirmative action in education and employment for all qualified persons regardless of race, color, religion, sex, national origin, age, disability, sexual orientation, or veteran status.

The college complies with the provisions of Titles VI and VII of the Civil Rights Act of 1964, as amended; Title IX of the Education Amendments of 1972 and the Higher Education Amendments of 1986; Sections 503 and 504 of the Rehabilitation Act of

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1973, as amended; the South Carolina Human Affairs Law of 1972; and with the Americans with Disabilities Act (ADA) of 1990 as well as the ADA Amendments of 2008 (ADAA).

For additional information on nondiscrimination policies, students should contact Student Disability Services, which coordinates Title II of the ADA/ADAA, Section 504 at (864) 250-8408 v/TTY; Title IX Coordinator at (864) 250-8144.

Technology Statement:

Greenville Technical College is not responsible for personal technology or internet access. Problems with computers, devices, or internet access are not acceptable for late work. When completing gradable coursework online, be sure to access a secure, reliable internet connection (preferably hardwired). All technical questions should be directed to technical support (https://www.gvltec.edu/about_greenvilletech/tech_support)

Due dates for all assignments and quizzes/tests are listed on the Course Schedule/Plan of Instruction. All graded work is time-stamped when submitted, so your instructor can check the time of submission. In addition, you will receive a confirmation email message when Blackboard Assignments are submitted. You must provide this confirmation information in case of any dispute regarding the submission.

Computer labs are available at multiple campus locations and offer various hours as well as staff available for assistance.

(https://www.gvltec.edu/student_resources/computer_labs)

Microsoft Office programs or PDF format are recommended for submitting assignments in Blackboard. Students can access portal.office.com, log in with their <username>@my.gvltec.edu email address and Blackboard/GTC4me password, then follow the prompts to install Microsoft Office free of charge.

Title IX Policy:

Greenville Technical College does not discriminate against any student on the basis of pregnancy or related conditions and will comply fully with Title IX regulations.

Absences due to medical conditions relating to pregnancy and maternity leave will be excused for as long as deemed medically necessary by a student's doctor, and the student will be given the opportunity to make up missed work. Documentation from the student's doctor is required. Students needing assistance may seek accommodations from the Title IX Coordinator or Student Disability Services. Please contact the Title IX

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Coordinator (TitleIX@gvltec.edu) or Student Disability Services (DisabilityServices@gvltec.edu) for additional information.

Attendance:

Attendance and participation are necessary for academic success. The student's record of attendance will begin on the first day of the course, even if registration occurs after the course has begun. Students are expected to attend and complete all scheduled instructional activities, both in class and online.

A student may withdraw from any course up to the published deadline. If the student drops the course during the add/drop period, no course tuition will be charged. If a withdrawal occurs after the drop/add period, tuition charges will result. Ceasing to attend class does not constitute an official withdrawal from the course and may result in financial aid consequences. Refer to the Refund Policy for details.

Administrative removal from a course:

- If a student preregisters for a course, but subsequently does not meet the prerequisite for the course, the course will be deleted from the student's schedule. Students will be notified via their college email account that the course has been removed.
- If a student registers for a course, but fails to attend (including failing to meet the criteria for being counted as present in an online course), the student will be administratively withdrawn from the course and will earn a grade of WA. The student will be responsible for payment for the course in accordance with the college refund policy. Students will be notified via their college email account that they have been administratively withdrawn.
- If a student attends a course at least once during the drop/add period, but fails to attend (including failing to meet the criteria to be counted as present in an online course) after the drop/add period, the student will be administratively withdrawn from the course and will earn a grade of W. The student will be responsible for payment for the course in accordance with the college refund policy. Students will be notified via their college email account that they have been administratively withdrawn.
- If a student is recorded absent for more than 20 percent of the course contact hours, whether face-to-face or online, the student will be administratively withdrawn from the course and will earn a grade of W. The student will be responsible for payment for the course in accordance with the college refund

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policy. Students will be notified via their college email account that the absences limit has been exceeded and that they have been administratively withdrawn.

Starfish:

We care about your success! Greenville Technical College is proud to offer Starfish, a software tool designed to promote student success through coordination and communication between students, instructors, and support staff.

When you set up your profile in Starfish, you can connect with services, faculty, and staff at Greenville Technical College. The link to Starfish is located in Blackboard. Throughout the term, you may receive emails regarding your attendance, course grades, or academic performance.

To benefit from this software, it is important that you check your Greenville Technical College Gmail regularly and read the Starfish alerts. If your academic performance begins to drop, you may also be contacted directly by a Success Coach or the Student Success Center.

Start, Stay, Succeed!