

# GREENVILLE TECHNICAL COLLEGE

## Business and Technology Division Computer Technology Course Syllabus IST 191: Linux Systems Administration

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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 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,

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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. 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>.
2. 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:**

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.

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

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### **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*

*The outcomes of the IST 191 course are intended to meet the Computer Technology program level student learning outcomes.*

### **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.

*Revised August 2012*

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### **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.

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

### **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 Resource area of Blackboard.

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## Grading Scale:

Grades for this course will be calculated as follows:

<b>Module Tests (Online Chapter Exams)</b>	<b>35 percent</b>
<b>Labs</b>	<b>35 percent</b>
<b>Final Examination (Written and Hands-On Lab)</b>	<b>30 percent</b>

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

<b>Final letter grades</b> will be issued as follows:	A	=	90 - 100
	B	=	80 - 89
	C	=	70 - 79
	D	=	60 - 69
	F	=	0 - 59

## Course Policies:

IST191 students must take the course final exam in order to receive a final overall grade.

### IST 191 – MAIN TOPICS

*Here is an outline of what will be covered in IST191:*

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

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- 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
    - 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

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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. Refer to attachment one for more details about this class.***

### **Disabilities Information**

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](mailto: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/>

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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](mailto:DisabilityServices@gvltec.edu).

Students who need a PDF reader for accessibility of course documents presented in PDF format may download a free reader at <https://acrobat.adobe.com/us/en/products/pdf-reader.html>

### **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!**