GREENVILLE TECHNICAL COLLEGE

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

Credit/Contact Hours
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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 users and groups, secure a Linux server, and to deploy and administer the core network services in a Linux system, such as Apache Web Server, Samba File Server, BIND Domain Name Service, Network File Service (NFS), and other network services.

Purpose of Course:
Students will learn how manage Linux users and groups, as well as secure a Linux server. Students will also learn how to install and configure Linux network services including Apache Web Server (Apache), Samba File Service (SMB), Berkley Domain Name Service (BIND), Network File Service (NFS), Postfix E-mail Service, and other Linux network services.

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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://rha.redhat.com.

2. NOTE: <u>Students in traditional classes</u> must access Blackboard for course-related information. <u>Students in hybrid and online classes</u> 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.

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

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.

Grading Scale:
Grades for this course will be calculated as follows:

Module Tests (Online Chapter Exams)	**35 percent**
Labs	**35 percent**
Final Examination (Written and Hands-On Lab)	**30 percent**

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

Final letter grades will be issued as follows:

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

Course Policies:
No additional policies specified at this time.

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 at
   - Scheduling Recurring Jobs with cron
   - 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

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.