University of Wisconsin-Stevens Point
College of Letters and Science
Department of Computing and New Media Technologies
Computer Information Systems
Networking Track

CIS462:
Server Administration

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Course Description

The course is structured into modules, with each module covering a part of the overall course content. In this course, you will gain an understanding of the major principles of the Linux operating system before exploring main functionalities. After that, we will explore the typically used services for Linux and Windows server environments for most of the main course time.

- **Prerequisites: CIS360 or instructor approval**
- **Rental course text: W. Soyinka, "Linux Administration – A Beginner's Guide", McGraw-Hill, 2009.**

Gathered data from student activities in this course will be part of an anonymous evaluation for research purposes. Please contact the instructor if you do not wish to have your data included.

Course Goals

At the end of the course, you will have a broad understanding of setting up and maintaining a Linux and/or Windows server as well as administration of users, groups, and services offered by a server in a heterogeneous networked environment.

Course Outline and Outcomes

First Lecture

This module serves as a general introduction and overview of the course. It will provide guidelines on how to successfully complete the course.

Introduction (Week 1)

This module additionally introduces Linux as an operating system. At the end of this module, you will be able to:

- Explain the ideas behind Linux
- Install Linux

Chapters: 1, 2

Linux Fundamentals (Weeks 2-4)

You will work on a particular Linux distribution and examine user and group management. You will also work on typical Linux commands from the BASH command shell. At the end of this module, you will be able to:

- Use typical Linux commands from the GNU tools set
- Manage installed applications
- Apply typical GNU tools to add/modify/delete groups and users (password, home directory, etc.)
- Give an example for simple scripting in the command line environment

Chapters: 3, 4, 5, 21

Linux Base System (Week 5)

This module covers more details about Linux: the boot process, file systems, and main system services. At the end of this module, you will be able to:

- Demonstrate knowledge about the initial booting process
- Demonstrate understanding of file systems in Linux
- Demonstrate knowledge about the core system services

Chapters: 6, 7, 8

Linux Network Configuration (Week 6)

You will learn how to configure Linux to securely operate in a networked environment. At the end of this module, you will be able to:

- Demonstrate how to configure Linux for network operations
- Manage a Linux firewall
- Apply basic network security settings

Chapters: 11, 12, 13

DNS and DHCP (Week 7)

These two services are the backbone for networks. We will look at the correct setup, configuration, and ongoing administration. At the end of this module, you will be able to:

- Demonstrate how to install, configure, and maintain a DNS server
- Demonstrate how to install, configure, and maintain a DHCP server

Chapters: 16, 27

Apache Web Server (Weeks 8-10)

The Apache web server is the most commonly used web server for the World Wide Web. We will look at typical installation and configuration of the apache server including virtual web sites, how to use simple and advanced authentication methods and SSL, and how to implement certificates. At the end of this module, you will be able to:

- Demonstrate how to install and configure the Apache web server
- Demonstrate how to install and configure additional scripting languages for the apache web server
- Show how to install and use certificates

Chapters: 18, selective assigned readings

Heterogeneous Networks (Week 11)

You will explore ways to use Windows and Linux computers in a network together. You will concentrate on how to setup, configure, and administrate a heterogeneous network environment. At the end of this module, you will be able to:

- Show how to install, configure, and maintain

Selective assigned readings

Windows Server (Weeks 12-14)

In this module, you will explore the Windows Server series of operating systems and implement the services covered in the Linux sessions for a Windows or mixed environment. At the end of this module, you will be able to:

- Show how to install, configure, and maintain all of the servers on Windows

Selective assigned readings

Virtualization (Week 15)

In this last module, you will investigate how virtualization can help with several problems typically encountered in modern network architectures.

Chapters: 28

Course Activities

Student Projects

Depending on the course, different student projects will be offered, some of them require you to have lab access, while others can be performed completely at home (you may have to install required software). Student projects are group-based and you are to work as a team – every team member has to know what and how the project goals were fulfilled. Questions will be asked from each team member.

You are encouraged to develop your own ideas for projects!

Online Discussions and Chats

The course will utilize online discussions/forums and chats during the course and especially for the student projects. Please limit your discussions to the appropriate sections. You are to solemnly use the online discussion and/or chat to communicate for your projects using the assigned project spaces in the discussion/chat areas of D2L.

The instructor will monitor conversations for appropriate content and reserves the right to delete inappropriate postings.

Professional Responsibilities

Upon graduation, you will be the amongst less than 30% of Americans that hold an academic degree. It is part of the responsibilities and duties of that degree to uphold high ethical and moral standards in society.

You should follow the outlined reading, class activities, and homework assignments, and be prepared for class. You are solely responsible for class attendance and participation and you are responsible for anything you missed. No make-up examinations will be given unless approved before the scheduled date or for validated medical or personal emergencies.

All assignments, quizzes, and lab sheets have a due date. You will typically have several days for their completion. If you do not complete items by the assigned due date, you have 2 days to submit late, but with reduced grade, see below.

Please see the University of Wisconsin-Stevens Point Student Academic Standards document for an overview of the university's policies and requirements. Also, refer to the professional societies of our area for definitions and how to properly cite other people's work:

- The IEEE: The Five Levels Of Plagiarism
- The ACM: ACM Policy and Procedures on Plagiarism

Written assignments will be checked for plagiarism and collaboration. Unless noted, you are to complete your assignments individually.

> ***If you use other people's work, you have to clearly point this out in any submitted work. Cheating and plagiarism will not be tolerated.***

Assessment, Points, and Grading

Each section of the course will have one or more online quizzes, which you are required to take in the allotted time frame, a maximum of 15 minutes. By their nature, online quizzes are open-book, which means that you are assumed to have fulfilled all reading assignments and know the content. Each quiz will be made available online at the end of a module and is worth 10 points. The quizzes will be available for multiple days; no submissions are allowed after the due date.

There will be several hands-on experiences allowing you to use your theoretical knowledge in a practical context. Each of these labs has additional graded questions and/or exercises. Lab worksheets will be made available online and the questions will have to be answered online as well. Each lab will be worth 10 points and you will have several days after the lab to complete the questions online; no submissions are allowed after the due date.

There will be one writing assignment worth 10 points for the initial course module. You have two days to submit after the due date, whereby the points you can earn are 50% on late day one, 25% on late day two, and 0% from day three onwards.

There is a comprehensive final exam, which will be completely online and cover the entire material of the course, including assignments and labs. The final exam will allow you to earn up to 3 points for each module, which will be added to your previous points for that module, up to the maximum number of points that were achievable per module.

Let q_i denote the points for quiz i you achieved out of Q quizzes, worth at most p_i points. Furthermore, let f_i denote the final exam part covering the same content as quiz q_i. The total points for the quizzes are then calculated after the final as

$$\sum_{i=1}^{Q} \min(p_i, q_i + f_i)$$

Mapping to Letter Grade

Your final letter grade will be awarded according to the following mapping scheme, based on the percentage of points that you have earned during the course. Please do not ask me to calculate this percentage for you – it's straightforward as follows.

Let P_t denote the maximum number of points that you could have achieved up to the current point in time during the course t and A_t denote the points that you actually achieved. Your current percentage of points is then calculated as

$$\frac{P_t}{A_t} \cdot 100$$

When mapped to letter grades, the following fixed mapping scheme will be applied.

Letter Grade	*Percent of Points*
A	>= 94
A-	>= 90
B+	>= 87
B	>= 84
B-	>= 80
C+	>= 77
C	>= 74
C-	>= 70
D+	>= 67
D	>= 60
F	< 60