

**LAGUARDIA COMMUNITY COLLEGE  
CITY UNIVERSITY OF NEW YORK DEPARTMENT OF MATHEMATICS,  
ENGINEERING, and COMPUTER SCIENCE**

**MAC254 ADVANCED WINDOWS & UNIX SYSTEM ADMINISTRATION**

**5 hours (3 lecture, 2 lab), 4 credits**

**Prerequisites:** MAC232, MAC233

**Catalog Description:**

This course provides students with the practical skills needed to serve as Windows and UNIX system administrators. Topics include installation and maintenance of Windows and UNIX servers, user administration and security, file system and folder permissions, DNS, LDAP deployment, Samba, NFS, login scripts, profiles and policy editor, directory services, DHCP, IIS, Apache, e-mail, printers, PowerShell, shell scripting, server and workstation troubleshooting, and network monitoring.

**Instructional Objectives:**

- 1.Introduce the functions of an Windows and UNIX System Administrator and explain differences between UNIX and NT.
- 2.Enable students to install several services on various types of computers ( Windows and UNIX O.S environment)
- 3.Reinforce basic Windows and X utilities for administration and demonstrate advanced utilities.
- 4.Provide students with the ability to configure a Web Server (IIS and Apache), DHCP and printer Servers.
5. Introduce students to installation and updates of service packs/patches.
- 6.Provide students with the skills to use Script programming.
- 7.To provide the students with the ability to work with systems allowing UNIX to act like a Windows Server.
- 8.Provide the student with the ability to troubleshoot Operating Systems including servers and workstations.
- 9.Reinforce skills to become a Windows and UNIX System Administrator

**Student Learning Outcomes:**

- 1.Explain the functions of an Windows and UNIX Systems Administrator.
- 2.Illustrate how to install and remove services for Windows and UNIX O.S.
- 3.Describe the most frequently used utilities for administrative functions.
- 4.Prepare Windows and UNIX servers to configure a Web server, DHCP, and other networking services including system security.
- 5.Identify needed Service Packs for Windows and UNIX servers and Workstation.
- 6.Demonstrate the skills needed for an Windows and UNIX system administrator. to work with PowerShell and Command Line.
- 7.Illustrate how UNIX can utilize the Windows Server environment without changing operating systems.
- 8.Identify common troubleshooting problems.
- 9.Prepare students to become System Administrators.

**Textbook:**

UNIX and Linux System Administration Handbook (5th Edition) 5th Edition by Evi Nemeth (Author), Garth Snyder (Author), Trent R. Hein, Ben Whaley (Author), Dan Mackin (Author), ISBN-13: 978-0134277554 , ISBN-10: 0134277554

Mastering Microsoft Windows Server 2012/R2 1st Edition by Greg Tomsho, ISBN-13: 978-1285-86834-9 , ISBN-10: 1-285-86834-x

**Grading Standards:**

Midterm	30%
Individual Lab Projects (5 @ 4% each)	20%
Group Lab Project(2 @10% each)	20%
Final	30%
<b>Total</b>	<b>100%</b>

**Grading Chart:**

Grade	F	D-	D	D+	C-	C	C+	B-	B	B+	A-	A
Cut Point	0	60	63	66	70	73	76	80	83	86	90	93

**Academic Integrity:**

This class will be conducted in compliance with LaGuardia Community College’s academic integrity policy.

**Attendance:**

The maximum number of unexcused absences allowed is 15% of the total class meetings (about 7 hours). Unexcused absences beyond this maximum will result in grade of WU or F.

**Comments:**

The grading standard listed above and the suggested homework problems listed in the course outline are both subject to modification by the instructor.

**COURSE OUTLINE**

<b>Weeks</b>	<b>Topic</b>	<b>Chapter</b>	<b>Suggested Homework</b>
Week 1	Introduction and installation of UNIX and Windows-based operating system: Installing	Chapter 1	

	<p>Servers and Deploying and Configure the DNS Services.</p> <p>Installation of NOS Servers and Service packs; Booting process, Boot Manager; runlevels; Disk Partition Selection; Protocol Selection, Virtualization and Troubleshooting Installation Problems.</p>		
Week 2	<p>Configuring Network Services and Protocols: Configuring Servers.</p> <p>Understanding TCP/IP, DNS, DHCP and Identifying the logical Structures of Windows Server and UNIX-based Network.</p>	Chapter 2	<p>Lab # 1: Installing a UNIX and a Windows based-network operating system and Design hard disk Layouts. Configure One-Layer DNS for Windows and UNIX-Based servers Operating Systems to support local recognition of Hostnames.</p>
Week 3	<p>Administration of User and Group using Management Tools: Review of the basic administrative and Domain infrastructure; Built- in Users; Creating of new user, groups and Organizational Units; work with User environment needs; user rights and security.</p>	Chapter 3	<p>Lab # 2: Configure UNIX- and Windows-based databases for recognizing network accounts. Setting network services available to UNIX and Windows for printing, file sharing, and applications.</p>
Week 4	<p>Storage Management: Configure Local Storage</p> <p>File Systems and Extended File System: The FAT Systems, NTFS; Working with Volumes, ext2/ext3/ext4, XFS, VFAT, RAID System, Virtual Machine Storage, Disk Quota; DFS, Journaling Systems; Package management, and creating Disaster Recovery Backups.</p>	Chapter 4	
Week 5	<p>Controlling Access to Resources: Configuring File and Share Access: Configuring Security Policies.</p> <p>Working with the Active Directory Architecture; Security Concepts(filters, firewalls, iptables, VPN), Active Directory Control; File Share Permission and Ownership; Kerberos; and Advanced Group Policy.</p>	Chapter 5	<p>Group Lab # 1: Configure Windows to Windows file sharing with smb. Configure UNIX to UNIX file sharing with NFS, and configure UNIX to Windows-based file sharing with samba.</p>

Week 6	Managing Computers and Users Thorough Group Policy; Active Directory Design: Site and Replication; Design Standards; and Organizational Units.	Chapter 5	Lab # 3; Implementing a Group Policy infrastructure and Objects.
Week 7	Networking and Advanced System Configuration and Management: Configuring Servers for Remote Management and Provide Remote Access Solution: TCP/IP Networking; Routing, Creating and Configuring Virtual Networks; Multiple Address Assignment for one NIC, and Establish Trust Relationship between Multiple Domains, Explicit and Transitive Trust.	Chapter 6	
Week 8	Implementing DHCP, FTP and IIS; Configuring, monitoring and testing services.	Chapter 7	Group Lab # 2: Configuring a DHCP server for UNIX and a Windows-based operating system. configure and http server for UNIX and a Windows-based operating system to support web Services: IIS and Apache.
Week 9	Server Management Using Remote Tools for Administration; Creating and configuring Virtual Machine settings. Provide Remote Access Solutions; Configuration of Virtual Private Networks and remote Administration tools.	Chapter 8	Lab # 4: Configure a FTP server for a UNIX and a Windows-based operating Systems to support remote file access and updates.
Week 10	Active Directory and Domain Objects; Implementing Local Group, Domain Local Group and Universal Groups	Chapter 8	
Week 11	Utilities to Connect to UNIX and Windows Servers; and Directory Service Migration Tool, and setting up email for users and Data Bases. LDAP Authentication using Deployment System Tools.	Chapter 9	
Week 12	Monitoring Removable Storage; Disk Security through Backup and Encryption, performing a Restore, automating repetitive	Chapter 10	Lab # 5: Creating a Disaster Recovery Backups.

	tasks using scripting and Optimizing servers.		
Week 13	Final Examination		