

**CENTRAL TEXAS COLLEGE
ITNW 1316
NETWORK ADMINISTRATION**

Semester Hours Credit: 3

INSTRUCTOR: _____

OFFICE HOURS: _____

I. INTRODUCTION

- A. An introduction to the basic concepts of network administration, this course focuses on configuring, managing, and troubleshooting networking features and services in a Microsoft Windows Server environment. Includes client-focused content where appropriate. Provides functional skills in planning and implementing infrastructure security.**
- B. This course serves as a required or elective course on various degree plans. Curriculum plans for degrees and certificates are listed in the current Central Texas College Catalog.**
- C. The delivery method of this course may be traditional lecture/lab, blended lecture/lab, or online.**
- D. Prerequisites: None.**

II. LEARNING OUTCOMES:

Upon successful completion of this course, Network Administration, the student will be able to:

- A. Describe a network (C7, C15, F1, F2, F10)**
- B. Explain the role of directory services (C5, C6, C7, C15, F2, F6)**
- C. Create and manage users (C6, C8, C15, C18, F8, F10, F12)**
- D. Set up distributed print services (C5, C6, C7, C15, C18, F1, F8, F9, F10)**
- E. Create file system and directory services security (C6, C8, C15, , F8, F10)**
- F. Configure IP Addressing and Services (C5, C7, C8, C15, C18, F8, F10)**
- G. Configure Name Resolution (C5, C7, C8, C15, C18, F8, F10)**
- H. Design Network Access (C5, C6, C7, C8, C15, C19, F8, F9, F10)**
- I. Arrange File and Print Services (C5, C6, C8, C15, C19, F8, F9, F10, F12)**
- J. Monitor and Manage a Network Infrastructure (C5, C7, C8, C15, C16, C19, C20, F8, F9, F10, F12)**

III. INSTRUCTIONAL MATERIALS

- A. The instructional materials identified for this course are viewable through www.ctcd.edu/books**
- B. Lecture Classes also require at least one USB storage device. Online students may use cloud based storage.**

IV. COURSE REQUIREMENTS

- A. Attend both lecture and lab or in the case of online delivery, be actively engaged in Blackboard and maintain constant progress.**
- B. Be prepared to participate in discussion, team projects/assignments and take unannounced assessments relating to the lecture materials.**
- C. Complete all exams/assessments.**
- D. Submit all assignments on time.**

V. ASSESSMENTS

- A. Student content mastery will be evaluated in the following areas:**
 - Assessments (midterm exam, quizzes, projects, discussion etc.)**
 - Final Assessment (final exam and/or semester project, participation)**
- B. Scheduled and unscheduled assessments will be given at the discretion of the instructor.**
- C. Exams/assessments may be composed of both subjective and objective questions plus computer output.**
- D. A student must take all exams/assessments. Both online and on campus students who know in advance that they will be absent due to school sponsored trips, military duty or orders, or any other valid reason, must arrange to take an early exam/assessment. Unexpected absences due to illness or other extenuating circumstances will require the student to contact the instructor about make-up work in lieu of the missed exam/assessment.**
- E. Students with unexcused absences will be given a zero for each missed assignment.**

VI. SEMESTER GRADE COMPUTATION

Course Requirements	Points	Points	Grade	Quality Points
Assignments	300	900 -1000	A-Superior	4
Assessments	300	800 - 899	B-Above Average	3
Final Assessment	400	700 - 799	C-Average	2
		600 - 699	D-Passing, but unsatisfactory	1
TOTAL	1000	0 - 599	F-Failure	0

VII. NOTES AND ADDITIONAL INSTRUCTIONS FROM THE INSTRUCTOR

- A. **Course Withdrawal:** It is the student’s responsibility to officially withdraw from a course if circumstances prevent attendance. Any student who desires to, or must, officially withdraw from a course after the first scheduled class meeting must file a Central Texas College Application for Withdrawal (CTC Form 59). The student must sign the withdrawal form.

CTC Form 59 will be accepted at any time prior to Friday of the 12th week of classes during the 16-week fall and spring semesters. The deadline for sessions of other lengths is:

10-week session	Friday of the 8th week
8-week session	Friday of the 6th week
5-week session	Friday of the 4th week

The equivalent date (75% of the semester) will be used for sessions of other lengths. The specific last day to withdraw is published each semester in the Schedule Bulletin.

For non-GoArmyEd active military students, the effective date of withdrawal is the filing date with the Education Center. For all other students, the effective date of withdrawal is the date that the withdrawal application is received by the Central Texas College representative.

Students who used financial aid, military tuition assistance, VA benefits, or other non-personal funds may be required to repay tuition and fees to the funding agency. For specific repayment requirements, contact the Office of Student Financial Aid or Veterans Services Office before withdrawing. Military tuition assistance students should visit their military Education Center or Navy College Office.

A student who officially withdraws will be awarded the grade of “W” provided the student’s attendance and academic performance are satisfactory at the time of official withdrawal. Students must file a withdrawal application with the College before they may be considered for withdrawal.

A student may not withdraw from a class for which the instructor has previously issued a grade of “F,” “FI,” “FN,” “IP,” or “XN.”

- B. Instructor Initiated Withdrawals:** Faculty are authorized to withdraw students who are not making satisfactory course progress to include failure to meet College attendance requirements as outlined in the section of the Catalog entitled “Satisfactory Progress Standards.” The instructor will assign the appropriate grade on CTC Form 59 for submission to the registrar.

Students enrolled in distance learning courses are expected to maintain constant progress throughout the course. Failure to do so may result in the student being administratively withdrawn by the instructor.

Students who have not attended class by the 12th class day of a 16-week course or the 6th class day of an 8-week term may be administratively withdrawn by the instructor with a grade of "W." Students may also be administratively withdrawn from any class when their absences exceed a total of four class meetings for a 16-week course or three class meetings for less than 16-week courses and; in the opinion of the instructor, the student cannot satisfactorily complete the course. In a distance learning course the last date of attendance is the last activity by the student in the course.

- C. Administrative Withdrawal:** A student may be administratively withdrawn by a designated member of the administrative staff of the College when the student has been placed on Academic Suspension or Disciplinary Suspension; the student has an outstanding financial obligation owed to the college; or the student registered for a course without the required prerequisite or departmental permission.

The College is under no obligation to refund tuition and fees, or other costs associated with an administrative or instructor initiated withdrawal.

- D. Incomplete Grade:** The College catalog states, “An incomplete grade may be given in those cases where the student has completed the majority of the coursework but, because of personal illness, death in the immediate family, or military orders, the student is unable to complete the requirements for a course...” Prior approval from the instructor is required before the grade of “IP” for Incomplete is recorded.
- E. Cell Phones and Pagers:** Students will silence cell phones and mobile devices while in the classroom or lab.
- F. Americans with Disabilities Act (ADA):** Disability Support Services provide services to students who have appropriate documentation of a disability. Students requiring accommodations for class are responsible for contacting the Office of Disability Support Services (DSS) located on the central campus. This service is available to all students, regardless of location. Review the website at

www.ctcd.edu/disability-support for further information. Reasonable accommodations will be given in accordance with the federal and state laws through the DSS office.

- G. **Instructor Discretion:** The instructor reserves the right of final decision in course requirements and may make changes to the course outline and/or assignments as needed.
- H. **Civility:** Individuals are expected to be aware of what a constructive educational experience is and be respectful of those participating in a learning environment. Failure to do so can result in disciplinary action up to and including expulsion.
- I. **Degree Progression:** Students who receive a grade of “D” are advised not to enroll in the next course for which this course was a prerequisite.
- J. **Failing Grade:** The grade of “F” or “FN” will be given for academic failure, non-attendance or scholastic dishonesty.
- K. **Scholastic Honesty:** All students are expected to maintain the highest standards of scholastic honesty in the preparation of all course work and during examinations. The college policy on scholastic honesty, including definitions on plagiarism, collusion, and cheating can be found at the following URL: <http://online.ctcd.edu/plagiarism.cfm>

VIII. COURSE OUTLINE

A. Lesson One:

1. **Learning Outcomes:** Upon successful completion of this lesson the student will be able to:
 - a. Explain the function of a server operating system in a network
 - b. Describe the editions of Windows Server 2012/R2
 - c. Define private cloud terms and technologies
 - d. Explain the core technologies of Windows Server 2012/R2
 - e. Describe Windows Server 2012/R2 roles
 - f. Summarize the new and enhanced features of Windows Server 2012
 - g. Plan a Windows Server 2012/R2 installation
 - h. Work with Windows Server Core
 - i. Use the new Features on Demand
2. **Learning Activities:**
 - a. Participate in collaborative discussions based on the assigned reading materials. (C9,C12,C14,F1, F2, F5, F6)
 - b. Complete assigned PC labs/simulations (C18, C19, C20, F8, F9, F11)
 - c. Submit assigned papers and/or projects (C5, C6, C8, F1, F2, F7, F9, F11)
3. **Unit Outline:**
 - a. Covers the Windows Server 2012/R2 server operating system. Students will learn about basic management tools that are available in this release of Windows Server. Different roles and services that can be installed are also briefly explored, followed by a summary of features in Windows Server 2012.
 - b. Covers the Windows Server 2012/R2 installation process, both for GUI and Server Core installs. Students will learn how to utilize a Windows Server Core install, and will discover the advantages / disadvantages of Server Core. Finally, students are shown how to use Features on Demand via a network share, as well as how to remove features from an installation to recover disk space.

B. Lesson Two:

1. **Learning Outcomes:** Upon successful completion of this lesson the student will be able to:
 - a. Work with server roles and features
 - b. Configure server modes
 - c. Manage servers remotely
 - d. Configure services
 - e. Configure NIC teaming
 - f. Work with down-level servers
2. **Learning Activities:**

- a. Participate in collaborative discussions based on the assigned reading materials. (C9,C12,C14,F1, F2, F5, F6)
- b. Complete assigned PC labs/simulations (C18, C19, C20, F8, F9, F11)
- c. Submit assigned papers and/or projects (C5, C6, C8, F1, F2, F7, F9, F11)

3. **Unit Outline:**

Covers the process to convert a Windows Server 2012/R2 server with a full GUI into a Server Core or Minimal Server Interface install. Students are then shown how to set up remote configuration services on Windows Server. Finally, students will learn about the different types of NIC teaming, and how to configure them.

C. **Lesson Three:**

1. **Learning Outcomes:** Upon successful completion of this lesson the student will be able to:

- a. Describe server storage
- b. Configure local disks
- c. Work with virtual disks
- d. Use Storage Spaces
- e. Describe how Windows implements file and print sharing
- f. Secure access to files with permissions
- g. Create file shares
- h. Describe Work Folders
- i. Configure and manage Windows printing

2. **Learning Activities:**

- a. Participate in collaborative discussions based on the assigned reading materials. (C9,C12,C14,F1, F2, F5, F6)
- b. Complete assigned PC labs/simulations (C18, C19, C20, F8, F9, F11)
- c. Submit assigned papers and/or projects (C5, C6, C8, F1, F2, F7, F9, F11)

3. **Unit Outline:**

- a. Covers the different types of storage options available within Windows Server 2012/R2. It also explores the different types of storage technologies commonly used in conjunction with servers. Students are guided through the process of adding storage within Windows Server, as well as how to use Storage Spaces.
- b. Covers the file and printer sharing mechanisms within Windows Server 2012/R2. Students will learn about file and share level permissions, as well as how to create new network shares. The use of Work Folders is covered, in addition to the management of Windows printers and print servers.

D. Lesson Four:

1. **Learning Outcomes:** Upon successful completion of this lesson the student will be able to:
 - a. Describe the role of a directory service
 - b. Install Active Directory
 - c. Describe objects found in Active Directory
 - d. Work with forests, trees, and domains
 - e. Configure group policies

2. **Learning Activities:**
 - a. Participate in collaborative discussions based on the assigned reading materials. (C9,C12,C14,F1, F2, F5, F6)
 - b. Complete assigned PC labs/simulations (C18, C19, C20, F8, F9, F11)
 - c. Submit assigned papers and/or projects (C5, C6, C8, F1, F2, F7, F9, F11)

3. **Unit Outline:**

Covers the Active Directory service, and guided on its use within a Windows network environment. The processes for installing and managing objects within Active Directory are covered. The chapter then focuses on how Active Directory environments are structured. The use and application of group policies is also discussed.

E. Lesson Five:

1. **Learning Outcomes:** Upon successful completion of this lesson the student will be able to:
 - a. Work with organizational units
 - b. Manage user accounts
 - c. Manage group accounts
 - d. Work with computer accounts
 - e. Automate account management
 - f. Describe the architecture and processing of group policies
 - g. Configure group policy settings, and manage and monitor group policies
 - h. Work with security templates
 - i. Configure Windows Firewall with Group Policy

2. **Learning Activities:**
 - a. Participate in collaborative discussions based on the assigned reading materials. (C9,C12,C14,F1, F2, F5, F6)
 - b. Complete assigned PC labs/simulations (C18, C19, C20, F8, F9, F11)
 - c. Submit assigned papers and/or projects (C5, C6, C8, F1, F2, F7, F9, F11)

3. **Unit Outline:**

- a. Covers the logical structure of Active Directory. Students will learn about users and groups, and how these objects are utilized within Active Directory to organize information. The use of group type and group scopes is explored, as well as how these are used in multi-domain and multi-forest environments.
- b. Covers the architecture of group policies so that students understand what a GPO is and how and where GPOs can be applied to an Active Directory structure. Students will also learn about security settings and user and computer environment settings that can be configured through group policies. They will learn how to apply standard security settings throughout a network and audit computers that aren't in compliance with designated standards. In addition, students will learn how to configure Windows Firewall with Group Policy.

F. **Lesson Six:**

1. **Learning Outcomes:** Upon successful completion of this lesson the student will be able to:

- a. Describe the TCP/IP protocol and its components
- b. Define IPv4 addressing and calculate subnet masks
- c. Configure IPv4 addresses
- d. Describe IPv6 addresses
- e. Define IPv6 address types
- f. Auto configure IPv6 addresses
- g. Transition from IPv4 to IPv6

2. **Learning Activities:**

- a. Participate in collaborative discussions based on the assigned reading materials. (C9,C12,C14,F1, F2, F5, F6)
- b. Complete assigned PC labs/simulations (C18, C19, C20, F8, F9, F11)
- c. Submit assigned papers and/or projects (C5, C6, C8, F1, F2, F7, F9, F11)

3. **Unit Outline:**

Covers some of the components of the TCP/IP protocol suite. Your students will learn how to subnet, IPv4 addresses and how to configure IPv4 addresses on Windows computers with both GUI and command-line tools. They will also be introduced to IPv6 and will learn about the structure of IPv6 addresses as well as a variety of methods for configuring IPv6 addresses on host computers. Your students will also discover ways to transition from an IPv4 network to an IPv6 network.

G. Lesson Seven:

1. **Learning Outcomes:** Upon successful completion of this lesson the student will be able to:
 - a. Describe the structure of Domain Name System
 - b. Install and configure DNS zones
 - c. Configure advanced DNS server settings
 - d. Monitor and troubleshoot DNS
 - e. Describe the DHCP protocol and process
 - f. Install and configure a DHCP server
 - g. Configure DHCP server settings
 - h. Configure a DHCP relay agent

2. **Learning Activities:**
 - a. Participate in collaborative discussions based on the assigned reading materials. (C9,C12,C14,F1, F2, F5, F6)
 - b. Complete assigned PC labs/simulations (C18, C19, C20, F8, F9, F11)
 - c. Submit assigned papers and/or projects (C5, C6, C8, F1, F2, F7, F9, F11)

3. **Unit Outline:**
 - a. Covers the structure of the worldwide DNS system, but the focus is on installing, configuring, and maintaining DNS in an Active Directory environment. To function properly, Active Directory depends on a service to resolve computer names to addresses and to find computers that offer specific services. Because the TCP/IP suite is the default protocol for Windows, Domain Name System (DNS) is the default name resolution protocol for Windows computers. For Windows domain networks, DNS is required for operation.

 - b. Covers DHCP. Every device on a network needs an IP address to communicate with other devices. Assigning static IP addresses to core equipment such as servers and routers is common, but statically assigning IP addresses to every computer is unwieldy. Dynamic Host Configuration Protocol (DHCP) is a means to assign an IP address to devices automatically, for defined periods of time, and with security concerns addressed.

H. Lesson Eight:

1. **Learning Outcomes:** Upon successful completion of this lesson the student will be able to:

- a. Install the Hyper-V server role
- b. Create and use virtual machines
- c. Configure virtual networks
- d. Work with virtual hard disks
- e. Manage and configure virtual machines

2. **Learning Activities:**

- a. Participate in collaborative discussions based on the assigned reading materials. (C9,C12,C14,F1, F2, F5, F6)
- b. Complete assigned PC labs/simulations (C18, C19, C20, F8, F9, F11)
- c. Submit assigned papers and/or projects (C5, C6, C8, F1, F2, F7, F9, F11)

3. **Unit Outline:**

Covers virtualization and the use of Hyper-V. Students learn to install and configure Hyper-V, configure virtual machines, manage virtual hard disks and virtual networks, and manage and optimize virtual machines.