I. INTRODUCTION

A. Design, implement, and support a network directory infrastructure in a multi-domain environment. This course provides an in depth knowledge of servers including deployment, maintenance and analysis, advanced file services, remote access, network policy, Active Directory, Group Policy, and DNS.

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. This course in conjunction with other courses listed on the degree plan serves as preparation for careers in computer network administration and information management.

D. Prerequisites: ITNW 1345 Implementing Network Directory Services (or concurrent enrollment).

II. LEARNING OUTCOMES

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

A. Describe the process for designing a directory services infrastructure and a network infrastructure that supports directory services. (C1, C3, C5, C6, C7, C8, C11, C15, C16, C17, C18, C19, C20, F 1, F2, F5, F6, F7, F8, F9, F10, F11, F12, F13, F16, F17)

B. Design a site infrastructure that meets the needs of an organization. (C1, C3, C5, C6, C7, C8, C11, C15, C16, C17, C18, C19, C20, F 1, F2, F5, F6, F7, F8, F9, F10, F11, F12, F13, F16, F17)

C. Design an administrative structure that meets the needs of an organization. (C1, C3, C5, C6, C7, C8, C11, C15, C16, C17, C18, C19, C20, F 1, F2, F5, F6, F7, F8, F9, F10, F11, F12, F13, F16, F17)
D. Design a Dynamic Host Configuration Protocol (DHCP) structure that supports directory services. (C1, C3, C5, C6, C7, C8, C11, C15, C16, C17, C18, C19, C20, F1, F2, F5, F6, F7, F8, F9, F10, F11, F12, F13, F16, F17)
E. Design a name resolution strategy that supports directory services. (C1, C3, C5, C6, C7, C8, C11, C15, C16, C17, C18, C19, C20, F1, F2, F5, F6, F7, F8, F9, F10, F11, F12, F13, F16, F17)

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 (4 GB preferred). 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:
   - Assignments (home network, in-class assignments, etc.)
   - Assessments (midterm exam, quizzes, projects, etc.)
   - Final Assessment (final exam and/or semester project, participation)
B. Scheduled and unscheduled quizzes 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. No make-up exams/assessments will be given. 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 see the instructor about make-up Prepare in lieu of the missed exam/assessment.

E. Students with unexcused absences will be given a zero for any missed work.

VI. SEMESTER GRADE COMPUTATION

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<tr>
<th>Course Requirements</th>
<th>Points</th>
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<tr>
<td>Assignments/Quizzes</td>
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<tr>
<td>Midterm Assessment</td>
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<td>Final Assessment</td>
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<td>0 - 599</td>
<td>F-Failure</td>
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VII. NOTES AND ADDITIONAL INSTRUCTIONS FROM THE INSTRUCTOR

A. **Information on the following Academic Policies, as described in the CTC Course Catalog will be followed:**
   1. Withdrawals
   2. Grading
   3. Class Attendance and Course Progress
   4. Scholastic Honesty

B. **Cell Phones and Pagers:** Students will silence cell phones and mobile devices while in the classroom or lab.

C. **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](http://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.

D. **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.
E. **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.
VIII. COURSE OUTLINE

A. Lesson One: Introduction of course requirements and objectives and deploying Windows Server.

1. Learning Outcomes:
   a. Describe the Windows Deployment Services process
   b. Describe situations in which Windows Deployment Services is used
   c. Create and Construct the Windows Deployment role
   d. Prepare with Windows Deployment Services images
   e. Construct DHCP for Windows Deployment Services

2. Learning Activities:
   a. Participate in collaborative discussions based on the assigned reading materials. (C9,C12,C14,F1, F2, F5, F6)
   b. Submit assigned exercises. (C5, C6, C8, F1, F2, F7, F9, F11)

3. Unit Outline:
   a. WDS process/requirements
   b. Attended/unattended deployment of a non-customized/customized Create image
   c. WDS initial configuration
   d. WDS Server properties
   e. Prepare with boot/Create images
   f. Creating unattended installations
   g. Preparing with discover images
   h. Updating images

B. Lesson Two:

1. Learning Outcomes: Upon successful completion of this lesson the student will be able to:
   a. Describe Windows Server Update Services
   b. Create the WSUS role
   c. Perform initial WSUS configuration
   d. Construct WSUS synchronization and approval rules
   e. Describe additional WSUS configuration tasks

2. Learning Activities:
   a. Participate in collaborative discussions based on the assigned reading materials. (C9,C12,C14,F1, F2, F5, F6)
   b. Submit assigned exercises. (C5, C6, C8, F1, F2, F7, F9, F11)

3. Unit Outline:
   a. Windows update
b. WSUS storage requirements/deployment options
c. Creating WSUS
d. Creating computer groups
e. Assigning computers to groups
f. Configuring Windows Update on client computers
g. Using Automatic Approval
h. Configuring Manual Approval/Update Sources/Proxy Servers
i. Updating files and language
j. Configuring SSL
k. Upgrading a WSUS server
l. Creating WSUS reports
m. Configuring WSUS with PowerShell

C. Lesson Three:

1. Learning Outcomes: Upon successful completion of this lesson the student will be able to:
   a. Construct Distributed File System servers
   b. Construct the File Server Resource Manager role service
   c. Construct file and disk encryption

2. Learning Activities:
   a. Participate in collaborative discussions based on the assigned reading materials. (C9,C12,C14,F1, F2, F5, F6)
   b. Submit assigned exercises. (C5, C6, C8, F1, F2, F7, F9, F11)

3. Unit Outline:
   a. Using DFS Namespaces and DFS Replication
   b. Configuring referrals and advances namespace settings
   c. Creating/optimizing DFS replication groups
   d. Managing staging folders
   e. DFS fault tolerance and load balancing
   f. Using replication diagnostics
   g. Cloning and recovering a DFS replication database
   h. Using FSRM
   i. Creating quotas and quota templates, modifying and monitoring quota
   j. Using file screens/storage reports
   k. File classification management
   l. Creating file management tasks
   m. Encrypting file system/BitLocker drive encryption
D. **Lesson Four:**

1. **Learning Outcomes:** Upon successful completion of this lesson the student will be able to:
   a. Analyze Windows Server events
   b. Construct and Apply tools to perform network monitoring
   c. Apply auditing to improve network security
   d. Describe remote access
   e. Create and Construct the Remote Access server role
   f. Construct the DirectAccess role server

2. **Learning Activities:**
   a. Participate in collaborative discussions based on the assigned reading materials. (C9,C12,C14,F1, F2, F5, F6)
   b. Submit assigned exercises. (C5, C6, C8, F1, F2, F7, F9, F11)

3. **Unit Outline:**
   a. Analyzing events
   b. Using Task Manager/Resource Monitor/Performance Monitor
   c. Configuring auditing with Group Policies
   d. Virtual Private Networks
   e. Finishing VPN configuration
   f. Configuring remote dial in/access options
   g. Configuring routing/Network Address Translation/Web Application Proxy
   h. Creating/configuring DirectAccess
   i. Advanced DirectAccess deployment options

E. **Lesson Five:**

1. **Learning Outcomes:** Upon successful completion of this lesson the student will be able to:
   a. Describe the components and flow of Network Policy Server and Construct RADIUS
   b. Construct Network Access Protection

2. **Learning Activities:**
   a. Participate in collaborative discussions based on the assigned reading materials. (C9,C12,C14,F1, F2, F5, F6)
   b. Submit assigned exercises. (C5, C6, C8, F1, F2, F7, F9, F11)

3. **Unit Outline:**
   a. RADIUS infrastructure
   b. Configuring RADIUS accounting
   c. Using certificates for authentication
d. Configuring NPS policies
e. Managing NPS templates
f. Importing and exporting NPS policies
g. System health validators
h. Health policies and enforcement methods
i. Remediation server groups and network
j. NAP client configuration

F. Lesson Six:

a. **Learning Outcomes:** Upon successful completion of this lesson the student will be able to:
   a. Describe Active Directory key concepts and components
   b. Clone a virtual domain controller
   c. Construct a read only domain controller
   d. Construct site
   e. Prepare with operations master roles
   f. Maintain Active Directory

b. **Learning Activities:**
   a. Participate in collaborative discussions based on the assigned reading materials. (C9, C12, C14, F1, F2, F5, F6)
   b. Submit assigned exercises. (C5, C6, C8, F1, F2, F7, F9, F11)

c. **Unit Outline:**
   a. Active Directory review
   b. Domain Controller cloning prerequisites
   c. Cloning a Domain Controller
   d. RODC installation
   e. Staged RODC installation
   f. RODC replication
   g. Read only DNS
   h. Site components
   i. Global catalog and universal group membership caching
   j. Operation master best practices
   k. Managing operations master roles
   l. Active Directory backup/restoration/defragmentation/cleanup/snapshots
   m. System state backup

G. Lesson Seven:

1. **Learning Outcomes:** Upon successful completion of this lesson the student will be able to:
   a. Construct user accounts and group policies
b. Construct account policies  
c. Create password settings objects  
d. Prepare with service accounts  
e. Describe the function of Group Policy  
f. Construct group policy settings  
g. Prepare with administrative templates  
h. Prepare with security templates  
i. Construct group policy preferences  

2. **Learning Activities:**  
a. Participate in collaborative discussions based on the assigned reading materials. (C9,C12,C14,F1, F2, F5, F6)  
b. Submit assigned exercises. (C5, C6, C8, F1, F2, F7, F9, F11)  

3. **Unit Outline:**  
a. Creating and modifying user accounts  
b. Creating and configuring group policies/local account policies  
c. Kerberos policy settings  
d. Creating and configuring a PSO  
e. Preparing service accounts  
f. Creating and linking GPOs  
g. Software installation policies  
h. Deploying scripts  
i. Folder redirection  
j. Computer/user configuration settings  
k. Using/migrating custom administrative templates  
l. Security configuration wizard  
m. Creating group policy preferences  

H. **Lesson Eight:**  

1. **Learning Outcomes:** Upon successful completion of this lesson the student will be able to:  
a. Construct group policy scope, precedence and inheritance  
b. Construct group policy client processing  
c. Construct the Group Policy Results and Group Policy Modeling tools  
d. Manage GPOs  
e. Describe Domain Name System  
f. Construct DNS zones  
g. Construct DNS resource records  
h. Manage zones  
i. Construct zone storage  
j. Construct round-robin DNS
2. **Learning Activities:**
   a. Participate in collaborative discussions based on the assigned reading materials. (C9,C12,C14,F1, F2, F5, F6)
   b. Submit assigned exercises. (C5, C6, C8, F1, F2, F7, F9, F11)

3. **Unit Outline:**
   a. GPO scope and precedence/inheritance
   b. GPO filtering
   c. Loopback policy processing
   d. Configuring slow link processing
   e. Changing background processing
   f. Processing unchanged policies
   g. Synchronous/Asynchronous processing
   h. Group Policy caching/forcing updates
   i. GPO backup and restore
   j. GPO migration and management delegation
   k. PowerShell Cmdlets for managing GPOs
   l. Active Directory backup/restoration/defragmentation/cleanup/snapshots
   m. System state backup
   n. Structure of DNS
   o. Constructing Forwarders
   p. Constructing DNS resource records
   q. Canonical Name(CNAME) records
   r. Pointer, Main Exchange, Name Server, Service Location, Start of Authority Records
   s. Zone delegation
   t. Zone transfer settings
   u. Construct Zone scavenging
   v. Active Directory zone replication scope
   w. Constructing replication to specific domain controllers
   x. PowerShell Cmdlets for working with DNS