Network Infrastructure
Course of Study for I297

Description
This I297 course of study outlines the sequence of learning activities to help you develop competence in the subject area of Network Infrastructure. Your competence will be assessed as you complete the I297 assessment (MCSE Exam 70-297). This course of study may take up to seven weeks to complete depending on your educational background, work experience, and the time that you are able to dedicate to your studies. Consult with your mentor if you wish to accelerate your progress through this course of study. It is important that you follow the activities sequentially as you prepare for your assessment. This tool is also designed to help you become an independent learner by providing multiple learning methods.

Introduction
My name is Jason Jia, the Course of Study Mentor for this course of study for Designing a Microsoft Windows Server 2003 Active Directory and Network Infrastructure for a Microsoft Windows Server 2003 Active Directory Infrastructure, Second Edition. My contact information and office hours are listed here for your reference:

Course of Study Mentor: Jason Jia
E-mail: jjia@wgu.edu
Telephone: 866-895-9660 ext. 5148
Office Hours: Monday, 8:30am – 5:00pm, Eastern Time
Tuesday, 8:30am – 5:00pm, Eastern Time
Wednesday, 8:30am – 5:00pm, Eastern Time

Are you currently an information technology professional? Are you planning to become an information technology professional in the future? Perhaps you simply want to become an expert in the Windows Server 2003 operating system? The I297 (i.e., Network Infrastructure) course provides you the opportunity to learn and master the Windows Server 2003 Professional.

Indeed, Microsoft Windows Server 2003 is one of the most widely used Windows server operating systems in different industries today. This operating system provides robust functions of computing that no other previous Windows Server operating systems (e.g., Windows NT Server 4.0 or Windows 2000 Server/Advance Server) have ever provided. Successfully mastering Windows Server 2003 provides a number of benefits, including the opportunity to become an expert in the field of information technology and the ability to improve productivity through installation, configuration, and troubleshooting of computers running the server operating system as well as planning, implementing, troubleshooting, and maintaining a Microsoft Windows Server 2003 network environment.

If you have prior experience with previous Microsoft server operating systems, including Windows NT Server 4.0 and/or Windows 2000 Servers/Advance Servers, it will be relatively easy for you to command Windows Server 2003 as it inherits a lot of attributes from those previous operating systems. According to this course of study, the total estimated time needed for studying and preparing for the I297 (MCSE Server 2003 Exam 70-297) is about eight weeks. Confidence, dedication, diligence, and perseverance are the key ingredients for your successfully passing your I297 assessment (MCSE Server 2003 Exam 70-297).
Once you successfully pass your MCSE Server 2003 Exam 70-297, you will become Microsoft Certified Professional (MCP)—a recipient of a highly reputable professional certification in the field of information technology. This certificate not only represents your achievement in successfully mastering Windows Server 2003 operating system, but it also serves as a stepping stone for you to enter the IT industry if you are not currently an IT professional. If you are currently an IT professional, this certificate may potentially help you obtain a promotion from your current employer or even an increase in your salary. Most important of all, it will help you become more successful in your lifelong career in one way or another.

This course of study will serve as an effective tool in helping you successfully command the Windows Server 2003 operating system. It will also help you to pass your MCSE Server 2003 Exam 70-297 the first time you take it at a Prometric testing center. Please follow the weekly activities as guidelines in your studies of I297 so that you can maximize your learning outcomes.

There are four competencies covered by the I297 Course of Study. They are:

**Competency 411.1.1: Infrastructure Security Conceptual Design**
The graduate can analyze business and technical requirements necessary to create the conceptual design for network infrastructure security.

**Competency 411.1.2: Infrastructure Security Logical Design**
The graduate creates logical designs for network services infrastructure.

**Competency 411.1.3: Infrastructure Security Physical Design**
The graduate can create the physical design for network infrastructure security.

**Competency 411.2.4: Client Infrastructure Security**
The graduate can create the physical design for client infrastructure security.

The textbook chapters assigned in this course cover each of these competencies and the competencies covered by the Microsoft 70-270 (I297) assessment (Microsoft refers to them as “skills being measured”).

The assessment is comprised of 55 questions (randomly selected from a pool of questions) and must be completed between one and three hours. To pass the assessment, candidates must achieve a score of at least 700 out of 1000 total points. Once you submit proof of your passing score (i.e., mail/fax your score report to WGU), WGU will record your result in your AAP.

**Learning Resources:**


Week 1
Preparing for Success
To successfully complete I297, you need the appropriate resources to aid your learning. You should also prepare a calendar to schedule time devoted to your studies. Share your calendar with family and friends so they are aware of your obligations.

Acquire Learning Resources
Arrange to obtain the learning resources listed below so there will be no delays in your studies. These items are essential for you, as this document will guide you week-by-week in the use of these materials. Some of these items must be shipped to you, so be sure that your mailing address information is current. If you click your name on your AAP, you can check your contact information.

☐ Obtain Your Textbook

This is the required learning resource for Client Systems (I297). All required readings for I297, including the textbook, are available online at SkillSoft (http://wgu.skillport.com/SkillPortFE/login/login.cfm), free for you to access whenever you need them. Please follow this course of study and complete the required readings, hands-on practices, and questions and answers accordingly.

If you wish to purchase a hard copy of this textbook, you may also choose to buy a hard copy from the WGU Bookstore (EdMap) or another bookstore at your own cost. Please use the ISBN number(s) to make sure that you order the correct edition. The hard copy comes with two CDs: a 180-day trial version of Windows Server 2003 CD and a practice test CD. To access the learning resource online, please enroll through the Learning Resource tab of your AAP.

☐ Access IT Academy
URL: http://itacademy.microsoftelearning.com

Access the Microsoft e-learning content for I297 through the IT Academy website.

Enter the access code in the text field and confirm that you have read the license agreement. The access code for the I297 e-learning content:

7015-WAGV1-1619

You will need to sign in with a Windows Live ID. If you have a MSN Hotmail, MSN Messenger or Passport account, this is your Windows Live ID. If you do not already have one of these types of accounts, follow the instructions to sign up with a free Windows Live ID.

When you get logged in you will see your e-learning content; which you will begin in an upcoming activity:
- Course 2282 and lab: Designing a Microsoft Windows Server 2003 Active Directory and Network Infrastructure.

Access SkillSoft Modules
Make sure that you can access your SkillSoft account, since there is a Windows Server 2003 installation review that you will need to work through in Week 2 of this course of study. This requires the same log-on procedure into WGU’s SkillPort portal as that of accessing your textbook (above): http://wgu.skillport.com/SkillPortFE/login/login.cfm. If you have any difficulty with your account or signing on, please contact the Learning Resources Department at learning@wgu.edu or 801-993-1334 for assistance.

Prepare for Your Studies
You need to also make sure that you have the right set-up of computer equipment and software to get started. You need to be able to access the online learning community that supports this course of study and need to know where to go to get help should you need additional support with your learning.

Hands-on Labs
It is highly recommended that you have a spare computer with Windows Server 2003 installed for hands-on practice purposes. The hands-on labs are incorporated throughout the MCSA/MCSE Self-Paced Study Kit (Exam 70-270). Each chapter of the book provides a troubleshooting lab. These labs are designed to help you roll up your sleeves and dive into the content. Many of these labs will have you looking at settings on your home computer, and often times making changes to them. Be sure you are careful to back up your settings before making any changes to your system.

You can conduct hands-on practice in the following ways:
1. You can use your current PC or laptop that runs Windows Server 2003 and do the hands-on practices based on the instructions of the practices associated with each of the activities in chapters in this course of study. It is highly recommended that you back up your data on a daily basis in case your PC or laptop malfunctions due to configurations resulting from those hands-on practices. You should also have your CD of Windows Server 2003 (not the 180-day trial version) handy in case you need to reinstall the Windows Server 2003 on your PC or laptop whenever necessary.

   Note: Did you know that as a student at WGU you qualify for free Microsoft Software related to your degree program? You can download free software through MSDN AA. All students are enrolled in this program and you should have received an email with access instructions. If you have not received this email or cannot remember you login information, please contact your mentor.

2. Another alternative is to have a spare PC or laptop ready, if applicable, so that you can conduct the hands-on practices after installing Windows Server 2003. This option is most favorable as you don’t have to worry about losing your data and time.
3. Finally, you can consider partitioning your current PC if your current PC/laptop is running Windows NT/2000/XP/Vista and if you have the software to help you partition your current hard drive on your PC/laptop. This option allows you avoid buying additional hardware (e.g., PC/laptop and/or hard drives) in order to conduct hands-on practices in this course of study. Please note that you still need to back up your data on a daily basis.

4. IT Academy includes resources and virtual labs that will provide you with hands on activities.

☐ Participate and Contribute to the Online Learning Community
The Network Principle Learning Community provides the advantage of sharing knowledge associated with Windows Server 2003 operating systems (I297) while also allowing everyone in the learning community the opportunity to freely exchange their learning experiences associated with Windows Server 2003. You are strongly encouraged to be an active participant in the Network Principle Learning Community by viewing and/or contributing to the discussions in discussion threads or blogs.

☐ Getting Help With Your Learning
As you are moving through the textbook, you are strongly encouraged to complete the questions at the end of each chapter. If you have difficulty in answering questions or completing any of the tasks in each activity with confidence, it is recommended that you try one or more of the following:

- Look in the learning community to see if you can find similar questions posed by others.
- Reach out to your peers for assistance, if possible.
- Contact your course of study mentor directly for help (please see the introduction of this course of study for contact information).

Creating the Physical Design for an Active Directory and Network Infrastructure (Part I)
This section provides an overview of the skills in creating the physical designs for a directory service and network infrastructure for a Microsoft Windows Server 2003 network.

By understanding the fundamental concepts of the key considerations needed when creating the physical designs for an active directory and network infrastructure, you will be able to design a network and routing topology, an IP address assignment strategy, the network services infrastructure, Internet connectivity, the network services infrastructure design remote access strategy, and the remote access infrastructure.

Competency 411.1.1: Infrastructure Security Conceptual Design
The graduate can analyze business and technical requirements necessary to create the conceptual design for network infrastructure security.

Introduction to Active Directory and Network Infrastructure
This topic is associated with chapter 1 of the textbook. This topic focuses on the basic concepts associated with Active Directory and network infrastructure, especially in terms of overviews of designing a TCP/IP infrastructure and providing for remote access.
Active Directory Overview
Read Lesson 1 (pp. 2–17), and then complete the associated hands-on practice and lesson review at the end of Lesson 1. Consider the following questions as you work through the lesson:

• Why do you need to deploy Active Directory on a network?
• What is the rationale behind the logical and physical structure of Active Directory?
• What are the interactions of the different components of Active Directory?
• Why is there a need to implement the Active Directory schema?

Complete the following lesson reviews before moving to the next lesson:

• Lesson Review (p. 1-17)

Domain Name System Overview
Read Lesson 2 (pp. 17–28), and then complete the associated hands-on practice and lesson review at the end of Lesson 2. Consider the following questions as you work through the lesson:

• Why is there a need to implement name resolution and DNS?
• Is there a way that you can find out the major components necessary in creating a DNS structure?
• What exactly is the name resolution process?
• How does DNS really work in Active Directory?

Complete the following lesson reviews before moving to the next lesson:

• Lesson Review (p. 1-28)

TCP/IP Overview
Read Lesson 3 (pp. 30–40), and then complete the associated hands-on practice and lesson review at the end of Lesson 3. Consider the following questions as you work through the lesson:

• What is the role of TCP/IP on a Windows Server 2003 network?
• Why do you design network IDs, hot IDs, and subnets?
• What is the theoretical basis of the basic routing process on a TCP/IP network?

Complete the following lesson reviews before moving to the next lesson:

• Lesson Review (p. 1-40)

Remote Access Overview
Read Lesson 4 (pp. 42–46), and then complete the associated hands-on practice and lesson review at the end of Lesson 4. Consider the following questions as you work through the lesson:

• Windows Server 2003 provides remote access through Routing and Remote Access service. How does that work?
• What are the connection methods available for remote access?
• Remote access will not happen unless there are protocols involved. What are the most used remote access protocols?
• What security mechanisms are available for remote access?

Complete the following lesson reviews before moving to the next lesson:

• Lesson Review (p. 31–46)
Questions and Answers
Complete the following:
• Questions and Answers (p. 1-51)

Managing and Maintaining a Directory Service Infrastructure—Administering Active Directory
This topic is associated with chapter 2 of the textbook. This topic focuses on the skills needed for identifying network topology and performance levels, analyzing existing network operating system implementation, analyzing the impact of Active Directory on the existing technical environment, analyzing security requirements for the Active Directory service, and analyzing the impact of the infrastructure design on the existing technical environment.

Analyzing the Company
Read Lesson 1 (pp. 3–15), and then complete the associated hands-on practice and lesson review at the end of Lesson 1. Consider the following questions as you work through the lesson:
• How do you devise the geographic model of a company?
• What is the most effective way for you to create a geographic map for the company?
• Where should you start if you want to gather material about the information flow in a company?

Complete the following lesson reviews before moving to the next lesson:
• Lesson Review (p. 2-21)

Analyzing the Existing Network Topology
Read Lesson 2 (pp. 18–27), and then complete the associated hands-on practice and lesson review at the end of Lesson 2. Consider the following questions as you work through the lesson:
• How do you depict the current network environment?
• What is the best way to identify and inventory the servers and workstations on the network?
• What are performance requirements?

Complete the following lesson reviews before moving to the next lesson:
• Lesson Review (p. 2-16)

Analyzing the Existing Directory Structure
Read Lesson 3 (pp. 30–42), and then complete the associated hands-on practice and lesson review at the end of Lesson 3. Consider the following questions as you work through the lesson:
• What is the current domain model?
• Where does the trust relationship exist?
• What is the current OU structure?
• Will you be able to explain the placement and roles of domain controllers?

Complete the following hands-on practices and lesson reviews before moving to the next lesson:
• Hands-on Exercise 1: Analyze the Existing Directory Structure (p. 2-24)
• Lesson Review (p. 2-26)
Restoring Active Directory
Complete the following:
• Case Scenario Exercise (p. 2-27)
• Questions and Answers (p. 2-31)

IT Academy e-Learning
URL: http://itacademy.microsoftelearning.com
Access the Microsoft e-learning content for I297 through the IT Academy website.

Begin working through the course materials and lab for Course 2282: Designing a Microsoft Windows Server 2003 Active Directory and Network Infrastructure. As you move through the COS, continue to progress through this course.

This resource was created by Microsoft and will help you prepare for your Microsoft certification exam.

Week 2
Creating the Physical Design for an Active Directory and Network Infrastructure (Part II)
This section provides an overview of the skills needed for creating the physical designs for a directory service and network infrastructure for a Microsoft Windows Server 2003 network.

By understanding the fundamental concepts of the key considerations when creating the physical designs for an active directory and network infrastructure, you will be able to design a network and routing topology, design an IP address assignment strategy, design the network services infrastructure, design Internet connectivity, design the network services infrastructure design remote access strategy, and design the remote access infrastructure.

Competency 411.1.1: Infrastructure Security Conceptual Design
The graduate can analyze business and technical requirements necessary to create the conceptual design for network infrastructure security.

Planning an Active Directory Structure
This topic is associated with chapter 3 of the textbook. This topic focuses on the skills needed for designing the Active Directory infrastructure to meet business and technical requirements, as well as designing an Active Directory naming strategy.

Designing a Forest and Domain Model
Read Lesson 1 (pp. 2–14), and then complete the associated hands-on practice and lesson review at the end of Lesson 1. Consider the following questions as you work through the lesson:
• How can you create the conceptual design of the Active Directory forest structure?
• Is there a way for you to distinguish the various forest and domain models and their purposes?
• What decision can you make in regard to a forest and domain model for a given situation?

Complete the following hands-on practices and lesson reviews before moving to the next lesson:
• Hands-on Exercise 1: Creating a Forest and Domain Model (p. 3-12)
• Lesson Review (p. 3-14)

☐ Defining a Naming Strategy
Read Lesson 2 (pp. 16–23), and then complete the associated hands-on practice and lesson review at the end of Lesson 2. Consider the following questions as you work through the lesson:
• What are the naming conventions used in Active Directory?
• What are the internet domain name registration requirements?
• What are the NetBIOS naming requirements?
• How can you devise a naming structure for an Active Directory environment?

Complete the following lesson reviews before moving to the next lesson:
• Lesson Review (p. 3-23)

☐ Exercises
Complete the following:
• Case Scenario Exercise (p. 3-24)
• Questions and Answers (p. 3-29)

Need more? Here is a great review:
SkillSoft provides an excellent way to review the Microsoft Windows Sever 2003 active directory and network infrastructure areas you may have struggled with in the textbook. This course module is located in the “My Plan” area of your SkillSoft account. Navigate to “My Plan” > “IT Undergraduate” > “I297” > “70-297 Designing a Microsoft Windows Server 2003 Active Directory and Network Infrastructure.”

Start and review the “Introduction to Active Directory and Network Infrastructure” lesson. Four topics are covered in individual instructional modules, each of which includes exercises and a self-assessment: Active Directory Overview, Domain Name System Overview, TCP/IP Overview, and Remote Access Overview.

Remember, if you are feeling confused after completing all of the activities for this topic area, please visit the Networking Principles Learning Community or contact the course of study mentor directly.
Week 3
Creating the Logical Design for an Active Directory Infrastructure

This section provides an overview of planning and creating logical designs for directory services within a Microsoft Windows Server 2003 network infrastructure by understanding the fundamental concepts of designing the Active Directory infrastructure to meet business and technical requirements, designing an OU structure, designing a user and computer account strategy, designing a security group strategy, designing a user and computer authentication strategy, designing a strategy for Group Policy of GPOs, designing the Active Directory infrastructure to meet business and technical requirements, as well as designing an Active Directory service site topology.

Competency 411.1.2: Infrastructure Security Logical Design
The graduate creates logical designs for network services infrastructure.

Designing an Administrative Security Structure
This topic is associated with chapter 4 of the textbook. This topic focuses on the skills needed for designing the Active Directory infrastructure to meet business and technical requirements, an OU structure, a user and computer account strategy, a security group strategy, a user and computer authentication strategy, and a strategy for Group Policy of GPOs.

One of the first things to plan for a network is the domain structure. Such considerations not only include domains and forests, but also future growth. Administrative control is another key factor to be considered. Finally, organizational unit structure, administration of group policy objects, separation of users and computers into different organizational units, as well as delegation of access to network resources should also be included during the logical design of an Active Directory within a Windows Server 2003 network.

Designing an Organizational Unit Structure
Read Lesson 1 (pp. 3–20), and then complete the associated hands-on practice and Lesson Review at the end of Lesson 1. Consider the following questions as you work through the lesson:

- What is the rationale for using organizational units?
- What is the best approach to use organizational units to delegate administrative control?
- How does inheritance affect my organizational unit plan?
- How do group policy requirements affect my design?

Complete the following hands-on practices and lesson reviews before moving to the next lesson:

- Hands-on Exercise 1: Designing an Organizational Unit Structure (p. 4-18)
- Lesson Review (p. 4-20)

Planning an Account Strategy
Read Lesson 2 (pp. 21–31), and then complete the associated hands-on practice and lesson review at the end of Lesson 2. Consider the following questions as you work through the lesson:

- How many types of accounts are available in Active Directory?
- What is the recommendation for implementing user accounts?
- What is the best approach in implementing groups?
Complete the following hands-on practices and lesson reviews before moving to the next lesson:
- Hands-on Exercise 1: Planning an Account Strategy (p. 4-30)
- Lesson Review (p. 4-31)

[ Designing a Group Policy Implementation ]
Read Lesson 3 (pp. 32–42), and then complete the associated hands-on practice and lesson review at the end of Lesson 3. Consider the following questions as you work through the lesson:
- Why do you need group policy, and what it is used for?
- What are the major considerations when implementing group policy in an organization?

Complete the following hands-on practices and lesson reviews before moving to the next lesson:
- Hands-on Exercise 1: Designing a Group Policy Implementation (p. 4-40)
- Lesson Review (p. 4-42)

[ Exercises ]
Complete the following:
- Case Scenario Exercise (p. 4-43)
- Questions and Answers (p. 4-47)

[ Designing a Site Plan ]
This topic is associated with chapter 5 of the textbook. This topic introduces skills necessary for the Active Directory replication strategy, an Active Directory service site topology, an Active Directory implementation plan, as well as migration paths to Active Directory.

[ Designing a Site Topology ]
Read Lesson 1 (pp. 3–9), and then complete the associated hands-on practice and lesson review at the end of Lesson 1. Consider the following questions as you work through the lesson:
- What is the theoretical basis on using sites to control network traffic across wide area network (WAN) links?
- What are the site boundaries, based on the physical network structure?
- How are sites actually linked?

Complete the following lesson reviews before moving to the next lesson:
- Lesson Review (p. 5-9)

[ Planning Domain Controllers ]
Read Lesson 2 (p. 10–20), and then complete the associated hands-on practice and lesson review at the end of Lesson 2. Consider the following questions as you work through the lesson:
- What is the strategy for placement of domain controllers within sites?
- Is there a rationale for the placement of forest root domain controllers?
- How do you devise global catalog servers?
- What are the recommendations when specifying operations masters roles for servers?
- Is there an optimized approach in identifying capacity requirements for domain controllers?
Complete the following hands-on practices and lesson reviews before moving to the next lesson:
  • Hands-on Exercise 1: Practice Questions (p. 5-20)
  • Lesson Review (p. 5-20)

☐ Planning a Replication Strategy
Read Lesson 3 (pp. 22–31), and then complete the associated hands-on practice and lesson review at the end of Lesson 3. Consider the following questions as you work through the lesson:
  • How does Active Directory replication occur within and between sites?
  • What is the practical use of site links, site-link bridges, and bridgehead servers?
  • What is considered to be a replication strategy for a company?

Complete the following hands-on practices and lesson reviews before moving to the next lesson:
  • Hands-on Exercise 1: Creating a Site Design and Replication Strategy (p. 5-29)
  • Lesson Review (p. 5-31)

☐ Designing a Migration Path
Read Lesson 4 (pp. 33–35), and then complete the associated hands-on practice and lesson review at the end of Lesson 4. Consider the following questions as you work through the lesson:
  • What are the primary considerations when migrating from Windows NT 4 domain?
  • What are the primary considerations when migrating from Windows 2000 domains?

Complete the following lesson reviews before moving to the next lesson:
  • Lesson Review (p. 5-35)

☐ Exercises
Complete the following:
  • Case Scenario Exercise (p. 5-36)
  • Questions and Answers (p. 5-41)

Week 4
Creating the Logical Design for a Network Service Infrastructure
This section provides an overview of creating an effective infrastructure of Active Directory Services within a Microsoft Windows Server 2003 network by understanding the fundamental concepts of designing the Active Directory infrastructure to meet business and technical requirements, designing an OU structure, designing a user and computer account strategy, designing a security group strategy, designing a user and computer authentication strategy, designing a strategy for Group Policy of GPOs, designing the Active Directory infrastructure to meet business and technical requirements, as well as designing an Active Directory service site topology.

Competency 411.1.3: Infrastructure Security Physical Design
The graduate can create the physical design for network infrastructure security.
Designing a DNS Structure
This topic is associated with chapter 6 of the textbook. This topic focuses on the skills needed for designing the network services infrastructure to meet business and technical requirements, designing DNS for Active Directory service implementation, designing a DNS name resolution strategy, designing a DNS service implementation, as well as designing DNS service placement.

☐ Analyzing the Existing DNS Implementation
Read Lesson 1 (pp. 3–9), and then complete the associated hands-on practice and lesson review at the end of Lesson 1. Consider the following questions as you work through the lesson:
• What are the various components of a DNS infrastructure?
• What are the various DNS server types and their functions in an existing infrastructure?
• How can you figure out the current namespace?

Complete the following lesson reviews before moving to the next lesson:
• Lesson Review (p. 6-9)

☐ Designing a DNS Name Resolution Strategy
Read Lesson 2 (p. 10–24), and then complete the associated hands-on practice and lesson review at the end of Lesson 2. Consider the following questions as you work through the lesson:
• What do you need to do in order to come up with a namespace design?
• What analysis do you need to conduct when considering DNS interoperability with Active Directory, WINS, and DHCP?
• How can you figure out zone requirements?
• How do you devise DNS security?
• Is there a way for you to design a DNS strategy for interoperability with UNIX BIND to support Active Directory?

Complete the following lesson reviews before moving to the next lesson:
• Lesson Review (p. 6-23)

☐ Designing a DNS Implementation
Read Lesson 3 (pp. 25–28), and then complete the associated hands-on practice and lesson review at the end of Lesson 3. Consider the following questions as you work through the lesson:
• Can you design a strategy for DNS zone storage?
• Why do you need to incorporate DNS server options?

Complete the following lesson reviews before moving to the next lesson:
• Lesson Review (p. 6-28)

☐ Designing a DNS Service Placement Strategy
Read Lesson 3 (pp. 29–34), and then complete the associated hands-on practice and lesson review at the end of Lesson 3. Consider the following questions as you work through the lesson:
• How will you devise a DNS service placement?
Complete the following hands-on practices and lesson reviews before moving to the next lesson:
  • Hands-on Practice 1: Designing a DNS Infrastructure (p. 6-33)
  • Lesson Review (p. 6-34)

☐ Exercises
Complete the following:
  • Case Scenario Exercise (p. 6-35)
  • Questions and Answers (p. 6-40)

Designing a Wins Structure
This topic is associated with chapter 7 of the textbook. This topic focuses on the skills needed for designing the network services infrastructure to meet business and technical requirements as well as designing a NetBIOS name resolution strategy.

☐ Understanding WINS
Read Lesson 1 (pp. 2–13), and then complete the associated hands-on practice and lesson review at the end of Lesson 1. Consider the following questions as you work through the lesson:
  • What are the primary components of a WINS infrastructure?
  • How does NetBIOS name resolution work and why is it still needed in a Windows Server 2003 environment?

Complete the following lesson reviews before moving to the next lesson:
  • Lesson Review (p. 7-13)

☐ Designing a WINS Infrastructure
Read Lesson 2 (pp. 15–21), and then complete the associated hands-on practice and lesson review at the end of Lesson 2. Consider the following questions as you work through the lesson:
  • What considerations must be taken into account when creating the conceptual design of a WINS infrastructure?
  • How can you decide the placement and amount of WINS servers required?
  • What are the major requirements when designing a WINS strategy for a non-routed and a routed network?

Complete the following lesson reviews before moving to the next lesson:
  • Lesson Review (p. 7-21)

☐ Designing a WINS Replication Strategy
Read Lesson 3 (pp. 22–26), and then complete the associated hands-on practice and lesson review at the end of Lesson 3. Consider the following questions as you work through the lesson:
  • What are the minimum requirements when coming up a strategy for WINS replication?
  • How do you design the process when implementing push and pull partners?

Complete the following hands-on practices and lesson reviews before moving to the next lesson:
  • Hands-on Exercise 1: Designing a WINS Replication Strategy (p. 7-25)
  • Complete: Lesson Review (p. 7-26)
Exercises:
Complete the following:
  • Case Scenario Exercise (p. 7-27)
  • Questions and Answers (p. 7-32)

Week 5
Creating the Physical Design for an Active Directory and Network Infrastructure (Part I)
This section provides an overview of the skills needed for creating the physical designs for a directory service and network infrastructure for a Microsoft Windows Server 2003 network.

By understanding the fundamental concepts of the key considerations when creating the physical designs for an active directory and network infrastructure, you will be able to design a network and routing topology, design an IP address assignment strategy, design the network services infrastructure, design Internet connectivity, design the network services infrastructure design remote access strategy, and design the remote access infrastructure.

Competency 411.2.4: Client Infrastructure Security
The graduate can create the physical design for client infrastructure security.

Designing a Network and Routing Infrastructure
This topic is associated with chapter 8 of the textbook. In this section, you will learn how to design a network and routing topology, design an IP address assignment strategy, and design the network services infrastructure to meet business and technical requirements.

Creating an IP Addressing Scheme
Read Lesson 1 (pp. 3–16), and then complete the associated hands-on practice and lesson review at the end of Lesson 1. Consider the following questions as you work through the lesson:
  • What are the various classes of IP addresses?
  • Are there any major concerns when designing a TCP/IP addressing scheme using Subnets?

Complete the following hands-on practices and lesson reviews before moving to the next lesson:
  • Hands-on Exercise 1: Creating an IP Addressing Scheme (p. 8-13)
  • Lesson Review (p. 8-16)

Designing a Perimeter Network
Read Lesson 2 (pp. 18–22), and then complete the associated hands-on practice and lesson review at the end of Lesson 2. Consider the following questions as you work through the lesson:
  • What are a perimeter network’s components, such as firewalls, Intrusion Detection System (IDS), and Microsoft’s Internet Security Acceleration (ISA) Server?
  • What is the recommended approach when designing and documenting your company’s perimeter network?

Complete the following lesson reviews before moving to the next lesson:
Understanding DHCP
Read Lesson 3 (pp. 24–27), and then complete the associated hands-on practice and lesson review at the end of Lesson 3. Consider the following questions as you work through the lesson:
- How does DHCP assign IP addresses?
- What is the DHCP IP address-assignment process?
- What are the major characteristics of APIPA (Automatic Private IP addressing)?

Creating a DHCP Strategy
Read Lesson 3 (pp. 29–33) and then complete the associated hands-on practice and lesson review at the end of Lesson 3. Consider the following questions as you work through the lesson:
- How can you use DHCP to implement IP address assignments?
- How can DHCP be integrated with DNS?
- What is the conceptual design of a DHCP infrastructure?
- How does DHCP work with various client types?

Exercises
Complete the following:
- Case Scenario Exercises (p. 8-34)
- Questions and Answers (p. 8-39)

Designing Internet Connectivity
This topic is associated with chapter 9 of the textbook. This topic focuses on the skills necessary for designing Internet connectivity for a company.

Identifying Redundancy Requirements
Read Lesson 1 (pp. 3–16), and then complete the associated hands-on practice and lesson review at the end of Lesson 1. Consider the following questions as you work through the lesson:
- What are the various links that provide redundancy?
- How can you find out the various connection types available?

Identifying Bandwidth Requirements
Read Lesson 2 (pp. 18–36), and then complete the associated hands-on practice and lesson review at the end of Lesson 2. Consider the following questions as you work through the lesson:
• You need to find out the bandwidth requirements of your network infrastructure. Where should you start?
• What are the specific requirements for the bandwidth usage for various computer technologies?

Complete the following lesson reviews before moving to the next lesson:
• Lesson Review (p. 9-10)

☐ Understanding NAT
Read Lesson 3 (pp. 38–43), and then complete the associated hands-on practice and lesson review at the end of Lesson 3. Consider the following questions as you work through the lesson:
• What is the function of the NAT protocol?
• What are the limitations of NAT?

Complete the following lessons reviews before moving to the next lesson:
• Lesson Review (p. 9-16)

☐ Design a NAT Strategy
Read Lesson 4 (pp. 44–54), and then complete the associated hands-on practice and lesson review at the end of Lesson 4. Consider the following questions as you work through the lesson:
• Can you create the conceptual design of a NAT strategy?
• How can you determine NAT Server options and placement?
• Where should you start if you want to secure your NAT solution?

Complete the following lesson reviews before moving to the next lesson:
• Lesson Review (p. 9-24)

☐ Exercises
Complete the following:
• Case Scenario Exercise (p. 9-26)
• Questions and Answers (p. 9-31)

Week 6
Creating the Physical Design for an Active Directory and Network Infrastructure (Part II)
This section provides an overview of the skills needed for creating the physical designs for a directory service and network infrastructure for a Microsoft Windows Server 2003 network.

By understanding the fundamental concepts of the key considerations used when creating the physical designs for an active directory and network infrastructure, you will be able to design a network and routing topology, design an IP address assignment strategy, design the network services infrastructure, design Internet connectivity, design the network services infrastructure design remote access strategy, and design the remote access infrastructure.

Competency 411.2.4: Client Infrastructure Security
The graduate can create the physical design for client infrastructure security.
Designing a Remote Access Strategy
This topic is associated with chapter 10 of the textbook. This topic focuses on the skills needed for designing the network services infrastructure to meet business and technical requirements, designing a remote access strategy, designing the remote access infrastructure, and designing security for remote access users.

☐ Designing a Remote Access Strategy
Read Lesson 1 (pp. 3–16), and then complete the associated hands-on practice and lesson review at the end of Lesson 1. Consider the following questions as you work through the lesson:
  • What are the various components of remote access?
  • Under what kind of circumstances should you implement the authentication method for remote access?
  • What is rationale behind the conceptual design of a remote access infrastructure?

Complete the following lesson reviews before moving to the next lesson:
  • Lesson Review (p. 10-16)

☐ Designing the Remote Access Infrastructure
Read Lesson 2 (pp. 18–21), and then complete the associated hands-on practice and lesson review at the end of Lesson 2. Consider the following questions as you work through the lesson:
  • How can you maximize the capacity of your remote access infrastructure?
  • What are the redundancy methodologies for your company’s remote access infrastructure?

Complete the following hands-on practices and lesson reviews before moving to the next lesson:
  • Hands-on Exercise 1: Designing a Remote Access Infrastructure (p. 10-22)
  • Lesson Review (p. 10-23)

☐ Designing Security for Remote Access Users
Read Lesson 3 (pp. 23–37), and then complete the associated hands-on practice and lesson review at the end of Lesson 3. Consider the following questions as you work through the lesson:
  • If you want to secure remote host computer systems, where should you start?
  • Why is there a need for remote access policies?
  • Why do you need to implement centralized administration through IAS?

Complete the following hands-on practices and lesson reviews before moving to the next lesson:
  • Hands-on Exercise 1: Designing Security for Remote Access Users (p. 10-32)
  • Lesson Review (p. 10-33)

☐ Exercises
Complete the following:
  • Case Scenario Exercise (p. 10-34)
  • Questions and Answers (p. 10-39)
Week 7
Practice Test Review
Review all material using a practice exam format. The practice tests are supplied by ExamForce and SkillSoft TestPrep.

SkillSoft TestPrep
Review all material using the practice exam format. The practice tests are supplied by SkillSoft TestPrep. The goal of using the Test Prep available through Skillsoft is NOT as the end-all-be-all judge of whether or not you can pass the actual certification exam. You should use this test prep to help you determine where the holes in your learning are. This tool, along with ExamForce (described in the next activity) are solely to help you identify which areas within this course of study you may need to spend more time with. This is a review of the competencies you learned and your readiness to take the Designing a Microsoft Windows Server 2003 Active Directory and Network Infrastructure exam (Exam 70-297).

ExamForce
ExamForce has two parts: a testing engine and a database. It is a powerful tool because it is adaptive; i.e., it chooses questions from its database based on user weaknesses, while still providing enough questions from strong areas to maintain strength. It divides what is presented into Passes. Once you have completed three Passes, you are ready to sit for the actual exam.

Enroll in ExamForce
Go to the I297 Learning Resources tab to enroll on your AAP. You may not enroll until you have completed this COS. Shortly after enrolling, usually within 1-2 business days, you will receive an email from ExamForce with your license key and instructions. Follow them carefully to download both the test engine and the database. **NOTE:** ExamForce databases are quite large, possibly over 100 MB. After installation, you will occasionally receive the opportunity to download and install updates. Download and install major updates with caution because they erase your History! Minor updates do not do this. Check with your mentor before accepting a major update.

Take the Pretest.
This is not the same as the pre-assessment that you took at the beginning of your studies. The Pretest Mode sets up initial conditions for the next Activity, Adaptive Drill Mode. Before moving on, though, take a look at the report produced from your Pretest. It will show you which exam objectives represent weaknesses for you. Additionally, it refers you to sections of its built-in review text for additional explanation.

Adaptive Drill Mode
Once you have reached the Adaptive Drill Mode, do not install major updates from ExamForce as this will erase your history. This warning will mention the fact that you have chosen to download a major database update. Please do not select the option to update.
You will be given a series of questions to respond to. **Passes are units of progress through the ExamForce database that systematically work on your weak areas while maintaining your strengths.** The ExamForce learning resource allows you to take notes as you work through the questions. If you get a question incorrect, you will be referenced to the appropriate section and chapter in the included textbook. There is a built in historical analysis system to track and monitor your activities. In order for your assessment referral to be approved, you MUST successfully complete all three phases of assessment readiness within the historical analysis system. Your results must be emailed to your mentor for confirmation.

**Email the Historical Analysis to Your Mentor**

When all three Passes are complete, email the report to your mentor. It is required as part of your record prior to approving a referral for the certification exam. The Historical Analysis report is always available either from the History button at the top of the ExamForce application, or from the Historical Analysis button in the Adaptive Drill tab. You may choose to email it using several formats, but WGU requires a pdf version, so select that option.

**Conclusion**

Congratulations! Upon completion of the practice exams, you have already successfully accomplished the goals of mastering the competencies set forth by WGU. By studying the chapters, lesson reviews, and the hands-on practice associated with each competency, you have acquired the knowledge and skills necessary for passing your I297 assessment in addition to your competency in mastering Designing a Microsoft Windows Server 2003 Active Directory and Network Infrastructure. If you feel that you are still not confident with the I297 assessment, please review the competencies and their associated chapters before taking your I297 assessment.

**Review of Competencies and Associated Chapters**

As demonstrated above, this course of study covers six competencies of I297. The four competencies and their associated chapters are:

**Competency 411.1.1: Infrastructure Security Conceptual Design**
The graduate can analyze business and technical requirements necessary to create the conceptual design for network infrastructure security.

- Chapter 1 (“Introduction to Active Directory and Network Infrastructure”)
- Chapter 2 (“Analyzing an Existing Infrastructure”)
- Chapter 3 (“Planning an Active Directory Structure”)

**Competency 411.1.2: Infrastructure Security Logical Design**
The graduate creates logical designs for network services infrastructure.

- Chapter 4 (“Designing an Administrative Security Structure”)
- Chapter 5 (“Designing a Site Plan”)

**Competency 411.1.3: Infrastructure Security Physical Design**
The graduate can create the physical design for network infrastructure security.

- Chapter 6 (“Designing a DNS Structure”)
- Chapter 7 (“Designing a WINS Structure”)
Competency 411.2.4: Client Infrastructure Security
The graduate can create the physical design for client infrastructure security.

- Chapter 8 (“Designing a Network and Routing Infrastructure”)
- Chapter 9 (“Designing Internet Connectivity”)
- Chapter 10 (“Designing a Remote Access Strategy”)

Transfer/Application to Work
Acquiring knowledge from textbooks is only part of the learning process. The ultimate goal of learning is to turn knowledge into skills that can be readily applied in the practical field. The following are some recommendations for transferring knowledge acquired through textbooks into practical skills real work environment:

- **Emphasis on hands-on practices:** Practice makes perfect. Hands-on practices help turn short-term memory into long-term memory. Finally, personal experiences also help reinforce learning outcomes.
- **Research on solutions through various channels:** There are many ways to research solutions on issues associated with Planning and Maintaining a Microsoft Windows Server 2003 Network Infrastructure, Second Edition. Since new issues may appear in the real work environment, textbooks are not good enough to cover all issues. Learning through research helps explore new solutions to new problems.
- **Collaborate and cooperate with peers or other students:** There are different ways of learning, including the use of cooperation and collaboration to facilitate learning processes. Working with your coworkers, fellow classmates, and even with other students in the learning community will definitely exert positive impact on your learning outcomes.

Next Steps: Take the Assessment
Once you have completed all the tasks associated with the competencies, chapters, activities, lesson reviews, hands-on practices, and preassessment(s), you can start scheduling for the actual assessment at a Prometric testing center. The following are the steps necessary for making arrangements for the actual assessment:

1. Refer for your I297 assessment by logging into your AAP. Click on the I297 link, and then the “Assessment Referral” tab.
2. Follow the step-by-step procedures necessary for referring for your assessment and submit the referral as needed.
3. Once your mentor has approved the referral, you will receive a voucher number by e-mail from the Vendor Assessment Department. **Hold onto this email; you will need it for step 5.**
4. With the voucher number, you will need to contact Prometric Testing Center ([http://www.prometric.com/TestTakers/default.htm](http://www.prometric.com/TestTakers/default.htm)) to arrange the actual date for the real assessment.
5. After the exam, submit your test results according to the instructions received in the voucher e-mail received in step 3, above.
6. Please contact your mentor if your AAP does not reflect the status of your assessment results after 3 business days.

Our best wishes to you as you take the I297 assessment.

Feedback
If you wish to provide feedback on this Course of Study, please contact Cheryl Bagshaw at cbagshaw@wgu.edu.