



PRINCE GEORGE'S COMMUNITY COLLEGE

CIS 237 – Planning and Maintaining a Microsoft Windows Network Infrastructure Certification Exam 70-293

Section 6777 – Largo Campus/L116 – Wed./Fri. – 8:00 – 9:40pm

Student Name: _____

Instructor: Trang Nguyen **Phone:** (301) 322-0754

Office Location: Lanham 201
Office hours will be posted at the door and attached to the end of the syllabus. I have other students so please schedule an appointment in advance to avoid conflict. I will be glad to meet with outside of office hours to assist you in your study.

Web Site: <http://academic.pgcc.edu/~tnguyen/>

Email: Email is the best contact method. Use PGCC_TDN@hotmail.com or Nguyentd@pgcc.edu (to get through PGCC's spam filter you must include the code **NM231** in either the Subject or the First Line of e-mails during this semester.)

Text Books: Microsoft Academic Learning Series (MS-ALS) - Planning and Maintaining a Microsoft Windows Server 2003 Network Infrastructure
ISBN: 0-07-294496-6: ALS Part X10-35347 - Text book by Craig Zacker
ISBN: 0-07-294489-7: ALS Part X10-35344 - Lab manual by Craig Zacker

Other Materials:

Important: Read the syllabus from the beginning to the end carefully. Students should also register for the companion course: CIS-232 – Windows Network Infrastructure Implementation, Section 6771 - Wed./Fri. – 6:00-7:50pm.

myPGCC: All students must have a “myPGCC” account to access PGCC's computing resources. Get your account from one of the following locations:

Bladen 102, UTC 226 and 246, <http://my.pgcc.edu>

Course Description: 3 credits - 2 class/2 lab hrs. Students will learn to analyze business requirements including information flow, company processes and the IT structure accessing current and future network needs. Topics covered include scalability and performance, evaluating multi-protocol routing designs, creating secure name resolution services, selecting components for Internet/Intranet access, developing remote access solutions, and monitoring and managing Windows 2003 network services. The course objectives prepare the students



for Microsoft Certified System Engineer exam #70-293. Students should take this course concurrently with CIS-232 Windows Network Infrastructure Implementation. **Prerequisite:** CIS 231.

Course Objectives: The course objectives are listed in the “CIS-237 Windows Network Infrastructure Course Objectives” section of the syllabus.

Expected Course Learning Outcomes: The expected course outcomes are listed in the MCSE “Exam 70-293: Planning and Maintaining a Microsoft Windows Server 2003 Network Infrastructure” objectives. It is attached to the back of this syllabus.

Expectations: Students are expected to read the chapters outlined in the syllabus prior to the lecture, and to perform the lab exercises. Students should expect to spend up to 4-6 hours outside of class per week. Students are expected to have a good understanding of the Windows environment, creating directory, changing directory and directory structure.

Grading: Grade will be earned from class participation, assignments, lab works, research projects, quizzes, chapter tests, and final exams. Your letter grade will be based on the following grading scale:

Point/Grade Scale:	A	90	or	Above
	B	80	-	89
	C	70	-	79
	D	60	-	69
	F	Below 60		

Attendance - will be used to help resolve tear-drop borderline course grades.

Description	Percent
Tests – Exams	75
Lab work, research project	20
Homework, quizzes and class participation	5
Possible Total:	100

Exams/Tests are announced in advance and must be taken on the date specified. In general, there is no make up test. *In the unlikely event you miss a test due to extreme emergency make up is possible. Authoritative proof of the emergency is required. Having to work, car problems, childcare problems are not valid excuses. **There is NO guarantee that you will be given the opportunity to take the make-up exam. Make-up is possible only at the instructor’s convenient even if it inconvenient you.*** Make-up test is available only one time per semester. All make-up tests must be taken within 10 calendar days after the test date; *there will be no exception to this policy.* All students **must** take the final exam on the day that it is given. The instructor must submit the final grade to the college on time for report card production, so there is no make-up for the final. A zero will be given if you miss the final. Should you know in advance that you would miss a test (except for the final exam), arrangements may be made to take it ahead of time (if the instructor deems it possible to do so). If you are late for class, no additional time will be given. ***Once you start the test, you***

must complete the test before leaving the class. Unless otherwise noted, there will be class after the test.

General Guidelines for Assignments: Assignment means any projects, homework or class assignment.

- **Due** at the *start of class* on the due date. It's your responsibility to hand-in your assignment. Do not wait for me to collect your homework. Any assignment not turned in when it is due is late, regardless of the reason that it is late, no tears, no excuses, and no exceptions.
- **Late** assignment may be turned in for reduced credit. To receive any credit. A late project must be turned in by the "late-turn-in" date, one week after it was due. **Ten-percentage point** (one letter grade) will be taken off for all late projects and homework assignments, regardless of reasons.
- **Hand-written** work will **not** be accepted, do not turn-in hand-written work; It shows that you didn't read the syllabus. Assignment must be typed, spell checked and grammar checked.
- **Multi-pages** assignment must be stapled. Invisible or imaginary staple, such as folding the pages at the corner, using chewing gum or spit, is **not** acceptable. Five-percentage point will be taken off for unstapled multi-pages assignment.
- **Folder** must be used when the assignment requires a folder or when a diskette is submitted with the assignment. All projects must be submitted in an approved folder (a 9"x11.5" folder with pockets). On the outside of the folder, print your name, the course name, meeting days/times, and the name of your instructor.
- **Diskettes** that you turn-in with the assignment must be secured in some fashion so that it does not fall out of the folder. It should contain only those files, which are part of the assignment. Make sure that the disk has an external label on it, which includes your name, the course name, and my name.

Others points include evaluation of student class participation, class and homework assignments, lab assignments, attendance, and quizzes.

Quizzes are **unannounced**. Quizzes will be given at the start or at the end of the class. If you are late for class, no additional time will be given. **There is no make-up**. Most of the quiz questions/answers come directly from the required reading assignments for the class session or from the class lectures following the previous quiz.

Extra credit projects: There is no extra credit project.

Disability Support Services: Students requesting academic accommodations are required to contact the Disability Support Services Office (M-1042) or call (301) 322-0838 (voice) or (301) 322-0122 (TTY) to establish eligibility for services and accommodations. Students with documented disabilities should discuss the matter privately with their instructors at the beginning of the semester and provide a copy of their Student/Faculty Accommodation Form.

Code of Conduct: The Prince George's Community College Code of Conduct defines the rights and responsibilities of students and establishes a system of procedures for dealing with students charged with violations of the code and other rules and regulations of the college. A student enrolling in the college assumes an obligation to conduct himself/herself in a manner compatible with the college's function as an educational institution. Refer to this instance syllabus academic year Student Handbook for a complete explanation of the code of conduct, including the procedure for dealing with disruptive student behavior.

Code of Academic Integrity: The Prince George's Community College is an institution of higher learning that holds academic integrity as its highest principle. In the pursuit of knowledge, the college community expects that all students, faculty, and staff will share responsibility for adhering to the values of honesty and unquestionable integrity. To support a community committed to academic achievement and scholarship, the Code of Academic Integrity advances the principle of honest representation in the work that is produced by students seeking to engage fully in the learning process. The complete text of the recently approved Code of Academic Integrity will be sent to all enrolled students early in the Fall 2005 semester and posted on the college's website.

Caveat Concerning Cheating: Copying versus helping: It is a very simple matter to copy someone else's work or to ask a friend to do the assignment for you. It is more difficult to ask that friend to help you understand the concepts and then assist in correcting your work. The former is cheating; the latter is legitimate student-to-student tutoring. The former teaches you nothing, though it may get you a perfect score on a given assignment; the latter improves your ability to tackle the next project, the next exam, and the next assignment after that. I discourage cheating, I do encourage you to work with each other to improve your understanding, that is, to tutor and assist each other. I expect that you will always be able to explain your work. If you cannot explain it, I will assume that you didn't do it, and I will grade it accordingly. If you are unsure of the difference between helping and cheating, it is better to err on the side of caution.

CIS Information Sheet: Students can pick the CIS Information Sheet at the College Life Office in Largo Student Center (near the bookstore). All official policies relating to students are in the information sheet. It will be available the first two weeks of class.

Student Information Handbook: The Prince George's Community College Student Handbook contains official policies and procedures regarding student conduct, academic integrity, and related matters. You are responsible for conducting yourself in accordance with those policies. The Student Handbook also contains a wealth of information designed to help students achieve success. Please pick up your free copy from the College Life Office in the Largo Student Center (near the bookstore).

Class Policies:

1. Attendance is necessary in a course of this type. You are expected to be **on time** and are responsible for all material covered in the lecture and in the book. Attendance will be taken and recorded. You must sign the attendance sheet. In case of unavoidable

- absence, it is your responsibility to get that class's lecture material, discussion of tests, projects, etc., from another student.
2. Occasional tardiness sometimes cannot be avoided. Habitual tardiness is disruptive and will not be tolerated. In the event of unavoidable lateness, quietly slip into the room so as not to disturb the class.
 3. Students may not have guests in the classroom. For those with children, this applies directly to you. For insurance reasons, *children must not be brought to the classroom!* If "child issues" prevent you from coming to class, please make arrangement to get lecture notes and assignments from another student.
 4. No food and drink are allowed in the classroom doubling as the computer lab.
 5. Put trash in the appropriate container. Put recyclable white paper in white paper recycle bin.
 6. Do not roll your chair in the lab.
 7. **Do not** use the lab computer as your multimedia media to listen to music.
 8. Please turn cellular phones, pagers or other electronic equipment off, or to a silent setting while in class.
 9. You may tape record lecture if the process does not disturb the professional atmosphere of the class.
 10. You are not permitted to wear hat in class, unless it's a medical and/or religious issue (proof is required).
 11. Students must respect me as well as others in the class by maintaining an environment conducive to a high learning experience. This includes respecting one another's learning pace and style.
 12. During lecture you are not to use the computer unless you are instructed to do so.
 13. Once the class is in session, your browsers must not contain any web contents external to the classroom. First violation will be a warning. Each additional violation will result in 5 points deduction from your cumulative score. *There will be no exception.*
 14. If you are attending class, please remain until dismissed. Should you need to leave early for whatever reason, please mention this to me at the start of class, and sit near an exit in order to slip out with minimum disruption. **Leaving early without permission affects your grade.**
 15. After I have gone over the syllabus in details with you in class, you will receive five homework bonus points if you do not ask any question during the semester and the answer to the question can be found in the syllabus.
 16. Students are expected to live up to the standard of PGCC Code of Conduct (see Student Handbook). The Student Handbook contains official policies and procedures regarding student conduct, academic integrity, and related matters. You are responsible for conducting yourself in accordance with those policies. The Student Handbook also contains a wealth of information designed to help students achieve success. The Student Handbook is available free of charge from the College Life Office in the Largo

Student Center (near the book store). *Academic dishonesty will not be tolerated nor will disruptions to the academic process.*

- Lab computer CD/DVD players are not for listening to music. No music/radio listening is allowed during class time.

College Closings:

If an emergency develops requiring school closing, the following radio stations will be asked to announce the closings: WMAL, WPGC, WRC, WTOP, WAMU, WAVA, WASH, WHUR, WWMX, and WGAY. The following TV stations will also be asked to announce the closing: WRC (4), WTTG (5), WJLA (7), WUSA (9), and News Channel 8. You may also call the college's general number, 301-336-6000, or check the college's web homepage at www.pgcc.edu where information about closings will be posted. **Please note that the college will have its own announcement which is separate from that of the Prince George's County Public Schools.**

Academic Calendar Fall 2007 (Credit)		
You should check the college official calendar for accuracy		
These dates apply to classes scheduled for sixteen weeks during the Fall 2007 credit semester.		
Day	Month/Dates	Events
Monday	August 27	Classes begin for Fall 2007
Sat.-Mon.	September 1-3	COLLEGE CLOSED – Labor Day
Wednesday	September 5	Last day to drop with a refund from 15-week classes
Monday	September 17	Last day to apply for fall graduation
Friday	September 28	Last day to change credit to audit or audit to credit
Friday	October 5	Last day to withdraw from first half-semester classes
Wednesday	October 17	Midterm; end of first half-semester classes
Thursday	October 18	Beginning of second half-semester classes
Tuesday	October 30	Professional Development Day - No classes
Tuesday	November 20	Last day to withdraw from 15-week classes
Wed.-Sun.	Nov. 21-25	COLLEGE CLOSED -Thanksgiving Vacation
Monday	November 26	College Re-opens and classes resume
Friday	November 30	Last day to withdraw from second half-semester classes.
Monday	December 10	Last day of regular classes for fall semester
Tues.-Monday	Dec. 11-17	Final examination period/last week of classes
	Dec. 22-Jan. 6	COLLEGE CLOSED - Winter break
Get ahead of the curve, sign-up for spring 2008 classes		

CIS 237 – Planning and Maintaining a Microsoft Windows Network Infrastructure

Classroom/Lab: Section 6777 – Largo Campus/L116 – Wed/Fri – 6:00 – 7:50pm

Session		Topics (Exact sequence of topics and emphasis may vary)
1	Aug. 29 Aug. 31	Course Introduction – Review Binary – Hexadecimal – IP – Subnet mask Chapter 1: Introduction to Network Infrastructure
2	Sept. 5 Sept. 7	Chapter 2: Assigning IP Addresses and DHCP
3	Sept. 12 Sept. 14	Chapter 4: Planning a Name Resolution Strategy DNS and Hosts, NetBIOS, LMHosts and WINS
4	Sept. 19 Sept. 21	Chapter 5: Connecting to the Internet
5	Sept. 26 Sept. 28	Test 1 – Chapters 1, 2, 4, 5 Chapter 3: Routing IP, Static and dynamic routing, tracert
6	Oct. 3 Oct. 5	Chapter 7: Securing a Network Infrastructure Securing LAN, Wireless and Remote Access
7	Oct. 10 Oct. 12	Chapter 9: Designing and implementing a Public Key Infrastructure
8	Oct. 17 Oct. 19	Chapter 9: Designing and implementing a Public Key Infrastructure
9	Oct. 24 Oct. 26	Chapter 10: Securing Network Communications
10	Oct. 31 Nov. 2	Test 2 – Chapters 3, 7, 9, 10 Chapter 6: Server Clustering
11	Nov. 7 Nov. 9	Chapter 8: Hardening Servers Windows Update Services (WUS) and Software Update Services (SUS)
12	Nov. 14 Nov. 16	Chapter 8: Hardening Servers Windows Update Services (WUS) and Software Update Services (SUS)
Nov. 21 - 25		Start of Thanksgiving break – No Class – Have a nice Turkey Day
13	Nov. 28 Nov. 30	Chapter 11: Maintaining a Network Infrastructure
14	Dec. 5 Dec. 7	Chapter 12: Trouble Shooting
15	Dec. 12	Final Exam – Chapters 6, 8, 11, 12 starting 6:00pm

CIS-237 Planning and Maintaining Windows Network Infrastructure Course Objectives

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

- Describe the network infrastructure design process and understand the security ramifications of network design decisions.
- Select the appropriate data-link and network/transport layer protocols for a given environment.
- Plan locations for workstations, peripherals, cables, connectivity devices, and servers on your network.
- Describe the structure of IP addresses and subnet masks and calculate IP addresses and subnet masks for subnetted networks.
- Understand how Dynamic Host Configuration Protocol (DHCP) automatically configures TCP/IP clients.
- Understand the functions of a router and the structure of a routing table.
- Select, install, and configure the dynamic routing protocol most suitable for your network.
- Use routers to connect LANs and wide area networks (WANs).
- Describe the structure of the DNS architecture and the DNS name resolution process.
- Create and implement an effective DNS domain hierarchy.
- Install and configure a WINS server.
- Describe the various wide area network (WAN) technologies used for Internet connections.
- List the criteria for determining how much Internet bandwidth a network needs.
- Determine the Internet access security requirements for a network.
- List the types of server clusters and determine which type of cluster to use for your applications.
- Describe how Network Load Balancing and server clusters work.
- Deploy NLB clusters and server clusters.
- List the default security settings for the Windows Server 2003 and Windows XP Professional operating systems.
- Describe the problems inherent in keeping the software on a large network installation updated.



- Use Microsoft Baseline Security Analyzer (MBSA) and Microsoft Software Update Services (SUS).
- Describe the security problems inherent in wireless networking.
- Control remote access with user account properties and remote access policies
- Understand the functions of group policies.
- Create a secure baseline installation for member servers and configure security for various server roles.
- Create and deploy security templates.
- Use the Security Configuration And Analysis snap-in and the Secedit.exe command line program.
- Describe the elements and functions of a public key infrastructure (PKI).
- Understand the functions of certificates and certificate authorities (CAs).
- Install, configure, and manage a CA.
- Describe the function and usefulness of packet filtering.
- List the well-known port numbers used by common applications and services.
- Understand the functions and architecture of the IPSec protocols.
- List the default IPSec policies included with Windows Server 2003 and their applications.
- Use the IP Security Policies snap-in to manage IPSec policies.
- Use the Performance console to view computer performance statistics in real time and capture counter information to log files.
- Use Network Monitor to capture and analyze network traffic.
- Understand the difference between full, incremental, and differential backup jobs.
- Configure Windows Server 2003 Remote Assistance and Remote Desktop.
- Understand how TCP/IP client configuration problems can affect computer performance.
- Use TCP/IP tools to isolate a router problem.

Expected Course Outcomes

CIS-237- Planning and Maintaining a Windows Network Infrastructure

Microsoft Certification Exam 70-293: This MCSE certification exam measures your ability to plan, design, and maintain the Windows network infrastructure. Before taking the exam, you should be proficient in the job skills measured by exam 70-293.

Skills measured by exam 70-293
Planning and Implementing Server Roles and Server Security
Configure security for servers that are assigned specific roles.
Plan a secure baseline installation. <ul style="list-style-type: none"> ▪ Plan a strategy to enforce system default security settings on new systems. ▪ Identify client operating system default security settings. ▪ Identify all server operating system default security settings.
Plan security for servers that are assigned specific roles. Roles might include domain controllers, Web servers, database servers, and mail servers. <ul style="list-style-type: none"> ▪ Deploy the security configuration for servers that are assigned specific roles. ▪ Create custom security templates based on server roles.
Evaluate and select the operating system to install on computers in an enterprise. Identify the minimum configuration to satisfy security requirements.
Planning, Implementing, and Maintaining a Network Infrastructure
Plan a TCP/IP network infrastructure strategy. <ul style="list-style-type: none"> ▪ Analyze IP addressing requirements. ▪ Plan an IP routing solution. ▪ Create an IP subnet scheme.
Plan and modify a network topology. <ul style="list-style-type: none"> ▪ Plan the physical placement of network resources. ▪ Identify network protocols to be used.
Plan an Internet connectivity strategy.
Plan network traffic monitoring. Tools might include Network Monitor and System Monitor.
Troubleshoot connectivity to the Internet. <ul style="list-style-type: none"> ▪ Diagnose and resolve issues related to Network Address Translation (NAT). ▪ Diagnose and resolve issues related to name resolution cache information. ▪ Diagnose and resolve issues related to client configuration.
Troubleshoot TCP/IP addressing. <ul style="list-style-type: none"> ▪ Diagnose and resolve issues related to client computer configuration. ▪ Diagnose and resolve issues related to DHCP server address assignment.
Plan a host name resolution strategy. <ul style="list-style-type: none"> ▪ Plan a DNS namespace design.

- Plan zone replication requirements.
- Plan a forwarding configuration.
- Plan for DNS security.
- Examine the interoperability of DNS with third-party DNS solutions.

Plan a NetBIOS name resolution strategy.

- Plan a WINS replication strategy.
- Plan NetBIOS name resolution by using the Lmhosts file.

Troubleshoot host name resolution.

- Diagnose and resolve issues related to DNS services.
- Diagnose and resolve issues related to client computer configuration.

Planning, Implementing, and Maintaining Routing and Remote Access

Plan a routing strategy.

- Identify routing protocols to use in a specified environment.
- Plan routing for IP multicast traffic.

Plan security for remote access users.

- Plan remote access policies.
- Analyze protocol security requirements.
- Plan authentication methods for remote access clients.

Implement secure access between private networks.
Create and implement an IPSec policy.

Troubleshoot TCP/IP routing. Tools might include the route, tracert, ping, pathping, and netsh commands and Network Monitor.

Planning, Implementing, and Maintaining Server Availability

Plan services for high availability.

- Plan a high availability solution that uses clustering services.
- Plan a high availability solution that uses Network Load Balancing.

Identify system bottlenecks, including memory, processor, disk, and network related bottlenecks.
Identify system bottlenecks by using System Monitor.

Implement a cluster server.
Recover from cluster node failure.

Manage Network Load Balancing. Tools might include the Network Load Balancing Monitor Microsoft Management Console (MMC) snap-in and the WLBS cluster control utility.

Plan a backup and recovery strategy.

- Identify appropriate backup types. Methods include full, incremental, and differential.
- Plan a backup strategy that uses volume shadow copy.
- Plan system recovery that uses Automated System Recovery (ASR).

Planning and Maintaining Network Security

Configure network protocol security.

- Configure protocol security in a heterogeneous client computer environment.

<ul style="list-style-type: none"> ▪ Configure protocol security by using IPSec policies.
<p>Configure security for data transmission. Configure IPSec policy settings.</p>
<p>Plan for network protocol security.</p> <ul style="list-style-type: none"> ▪ Specify the required ports and protocols for specified services. ▪ Plan an IPSec policy for secure network communications.
<p>Plan secure network administration methods.</p> <ul style="list-style-type: none"> ▪ Create a plan to offer Remote Assistance to client computers. ▪ Plan for remote administration by using Terminal Services.
<p>Plan security for wireless networks.</p>
<p>Plan security for data transmission.</p> <ul style="list-style-type: none"> ▪ Secure data transmission between client computers to meet security requirements. ▪ Secure data transmission by using IPSec.
<p>Troubleshoot security for data transmission. Tools might include the IP Security Monitor MMC snap-in and the Resultant Set of Policy (RSOP) MMC snap-in.</p>
<p>Planning, Implementing, and Maintaining Security Infrastructure.</p>
<p>Configure Active Directory directory service for certificate publication.</p>
<p>Plan a public key infrastructure (PKI) that uses Certificate Services.</p> <ul style="list-style-type: none"> ▪ Identify the appropriate type of certificate authority to support certificate issuance requirements. ▪ Plan the enrollment and distribution of certificates. ▪ Plan for the use of smart cards for authentication.
<p>Plan a framework for planning and implementing security.</p> <ul style="list-style-type: none"> ▪ Plan for security monitoring. ▪ Plan a change and configuration management framework for security.
<p>Plan a security update infrastructure. Tools might include Microsoft Baseline Security Analyzer and Microsoft Software Update Services.</p>



Operating System Planning Worksheet

Your Name: _____
(Last, First, Middle Initial)

Computer ID: _____ (The hard drive two digit number - DO NOT write down the workstation number)

Computer Name: _____ (the word "Student" and Computer ID number; ie: Student05)

User Name: _____ (First Initial, Middle Initial, Last Name; ie: TDNnguyen)

Organization: _____ (PGCC plus your course code; ie: PGCC CIS-232 or PGCC CIS-237)

Password: _____ (Do **not** use password, until you are instructed to use a password)

Drive Format: **NTFS** (you will format the partition with NTFS)

Product Key: _____ - _____ - _____ - _____ - _____

Workgroup Name: **Workgroup** (Windows XP Professional)

Domain Name: _____ (Windows 2003 Server or Advance Server)
(Depending on system being installed: Use "Student" or "Team" plus your assigned two digit number)

Fully Qualified Domain Name: _____ (Windows 2003 Server or Advance Server)
(the domain name plus the ".com")

NETBIOS Name: _____ (Default to the computer name)
(Use NETBIOS plus the two digit computer ID, if you have any problem; ie: NETBIOS05)

TCP/IP Information for static IP:

IP address: _____ (from instructor as needed)

Subnet mask: _____ (from instructor as needed)

Default Gateway: _____ (from instructor as needed)

Time Zone: (GMT -05:00) Eastern Time (US & Canada)

- Miscellaneous:
1. System partition size is 2040 Megabytes.
 2. _____
 3. _____
 4. _____