Washtenaw Community College Comprehensive Report

CNT 223 Networking with Windows Server 2016
Effective Term: Spring/Summer 2018

Course Cover

Division: Business and Computer Technologies
Department: Computer Instruction
Discipline: Computer Networking Technology
Course Number: 223
Org Number: 13400
Full Course Title: Networking with Windows Server 2016
Transcript Title: Networking with Windows Server
Is Consultation with other department(s) required: No
Publish in the Following: College Catalog , Time Schedule , Web Page
Reason for Submission: Course Change
Change Information:
  Course title
  Course description
  Pre-requisite, co-requisite, or enrollment restrictions
  Outcomes/Assessment
  Objectives/Evaluation
Rationale: The three Microsoft MCSA Certifications have totally changed for the 2016 version of Windows Server. The emphasis with the 2nd certification (which CNT 223 aligns to) is now Networking Services in contrast to the Windows Server 2012 version which covered topics that have now been moved to the other two certifications. Also, a considerable number of new features have been added, resulting in additional material to incorporate into this version of the course.
Proposed Start Semester: Spring/Summer 2018
Course Description: This course is part of a series of courses that provide skills and knowledge necessary to work in a Windows Server 2016 environment and lays a foundation for the second Windows Server 2016 MCSA certification. Topics include networking basics such as IPv4 and IPv6 addressing, inter-LAN communication between windows servers and clients, DCHP and DNS server installations and configuration, remote access services including routing, dial-up, VPNs, direct access, radius server, NIC teaming, network address translation, remote desktop gateway, distributed file system, branch caching, and IPAM. The title of this course was previously Administering Windows Server 2012.

Course Credit Hours

Variable hours: No
Credits: 4
Lecture Hours: Instructor: 60 **Student:** 60
Lab: Instructor: 0 **Student:** 0
Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 60 **Student:** 60
Repeatable for Credit: NO
Grading Methods: Letter Grades

Audit
Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

No Level Required

Requisites

General Education

General Education Area 7 - Computer and Information Literacy
Assoc in Arts - Comp Lit
Assoc in Applied Sci - Comp Lit
Assoc in Science - Comp Lit

Request Course Transfer

Proposed For:

Student Learning Outcomes

1. Recognize and identify basic networking principles for Point to Point and Cross-Network Communication including MAC addressing, IPv4 and IPv6 Addressing schemes and advanced concepts such as subnetting and the transition technologies for IPv6.

   Assessment 1

   Assessment Tool: Written exam specifically created for the assessment

   Assessment Date: Fall 2020

   Assessment Cycle: Every Three Years

   Course section(s)/other population: All course sections

   Number students to be assessed: All students

   How the assessment will be scored: Rubric: A written test will be given that addresses both the outcomes and objectives listed in the syllabus. This test will be divided into sections, each identified with an outcome and the questions in each section will address the objectives.

   Standard of success to be used for this assessment: Average of all students taking the test should equal or exceed 70% correct answers for all questions used in the assessment test. 70% or greater of the number of students taking the assessment test should equal or exceed that 70% mark for all the questions used in the assessment test. Outcome success: average of all student scores for each particular outcome's part of the test equal to or exceeds 70%.

   Who will score and analyze the data: All departmental instructors who teach sections of this course

2. Identify domain name service (DNS) concepts, including various types of zone creation and categories of resource records, as well as alternative resolution techniques such as standard and conditional forwarding.

   Assessment 1

   Assessment Tool: Written exam specifically created for the assessment

   Assessment Date: Fall 2020

Assessment Cycle: Every Three Years
Course section(s)/other population: All course sections
Number students to be assessed: All students
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Who will score and analyze the data: All departmental instructors who teach sections of this course

3. Define the concepts behind various remote access implementations of Windows Server such as routing, dial-up, PPT and SSTP VPNs, remote desktop configurations through VPNs, Direct Access, and NPS (RADIUS) servers.

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Assessment Cycle: Every Three Years
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How the assessment will be scored: Rubric: A written test will be given that addresses both the outcomes and objectives listed in the syllabus. This test will be divided into sections, each identified with an outcome, and the questions in each section will address the objectives. Standard of success to be used for this assessment: Average of all students taking the test should equal or exceed 70% correct answers for all questions used in the assessment test. 70% or greater of the number of students taking the assessment test should equal or exceed that 70% mark for all the questions used in the assessment test. Outcome success: average of all student scores for each particular outcome's part of the test equal to or exceeds 70%.
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4. Identify methods for centralizing remote locations for file sharing including DFS (Distributed File System), BranchCaching, Remote Desktop Gateway and for centralizing remote management of IP Address Networks (IPAM).

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Assessment Cycle: Every Three Years
Course section(s)/other population: All course sections
Number students to be assessed: All students
How the assessment will be scored: Rubric: A written test will be given that addresses both the outcomes and objectives listed in the syllabus. This test will be divided into sections, each identified with an outcome and the questions in each section will address the objectives. Standard of success to be used for this assessment: Average of all students taking the test should equal or exceed 70% correct answers for all questions used in the assessment test. 70% or

greater of the number of students taking the assessment test should equal or exceed that 70% mark for all the questions used in the assessment test. Outcome success: average of all student scores for each particular outcome's part of the test equal to or exceeds 70%.

Who will score and analyze the data: All departmental instructors who teach sections of this course

5. Identify the methods used to create and deploy a Windows DHCP Server, including scope creation, server and scope options, failover methods, relay agents, and superscopes.

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> Number students to be assessed: All students
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Course Objectives

1. Recognize and identify the forms of IPv4 addressing, including classful and classless, the use of subnet masks for network identification, and define the process of subnetting IPv4 addresses.
2. Recognize and identify the forms of IPv6 addressing, including the various types, the new multicasting protocols, and the transition technologies associated with the changeover from IPv4 to IPv6.
3. Define and distinguish between the various types of network traffic measuring tools such as Resource Monitor, Task Manager, and Performance Monitor plus investigate network card configurations using Device Manager, Network & Sharing Center, and the System Information Tool.
4. Define and identify the seven layers of the OSI model as well as the various tools used for IPv4 troubleshooting, including Ping, tracert, netstat, nbtstat, ipconfig, route, arp, and nslookup.
5. Define and distinguish between the various methods for network sharing and management between servers and clients using SMB networking, Computer Management, and Remote Desktop.
6. Identify the various zones associated with DNS management, the relationship of these zones to the authority over sections of namespace, and the configuration of various types of zones, including primary, secondary, delegated, stub, and root.
7. Define the various types of resource records, including A-Records, PTR records, as well as many types of service records that are used with Server, including the method of configuration for these records and the use of dynamic updating for building the database.
8. Distinguish the various methods of managing DNS using the DNS console tools, including configuring updates with secondary servers, lookups between Primary and other types of zones such as Stub, creation of Alias Name Records, and control over outdated and obsolete records.
9. Define other methods of Client Host/Domain resolution, including the use of the HOSTS file, the use of FQDN names with UNC paths to reach remote networks by name, and the appending of DNS

suffixes to NetBios names in order to use a DNS server.

10. Define other methods of Server Host/Domain resolution, including both Standard and Conditional Forwarding, identifying the advantages of using either technique.
11. Identify the concepts behind VPN creation, including configuration of a VPN Server, a RAS Carrier connection, and the setup of a VPN Client on a remote machine for testing.
12. Define the concepts behind a Network Access Policy (RADIUS) Server, including both setup of the RADIUS server and the contacting RAS Servers as well as the testing techniques used with Remote Clients.
13. Distinguish the various types of Server Router configurations using both Dynamic Routing Protocols as well as Static Routing in scenarios with multiple IP networks.
14. Identify the principles behind Remote Desktop connections including incorporating them into other carrier connections such as RAS VPN's or Direct Access.
15. Define the steps for NPS Policy evaluation including Condition/Constraints/Permissions/Settings and the steps for the creation and testing of a NPS Access Control list to use with RAS.
16. Identify the implementation of a Distributed File System, which is used to centralize access to resources on large numbers of servers at remote locations in one place, and distinguish the types of namespaces, the links, as well as the Link Order Configurations.
17. Distinguish and define the characteristics of using BranchCache which enable content from file and Web servers on a wide area network (WAN) to be cached on computers at a local branch office thereby reducing WAN traffic and improving Client response time.
18. Define the various aspects of the IP Address Management, (IPAM) including setting up IP Address Blocks, Subnets, and Ranges and remotely controlling and Managing DHCP and DNS Servers which are part of an Active Directory Forest.
19. Define the concepts behind Remote Desktop Gateway including setting up the Gateway Server with the proper Certificates and Connection Policies, plus setting up the Remote Client with the Gateway Server and Internal Server Authentications.
20. Identify the steps for enabling Network Card Teaming, including creating a "virtual" NIC, the addressing involved, the cabling, and the steps for testing performance.
21. Identify the steps for setup of a Windows DHCP Server including setting up the basic IP address Scopes, Lease Configuration, and the various Server and Scope options plus the steps for testing the Server through Client contact.
22. Identify the concepts behind DHCP Filtering, DHCP Reservations, DHCP Failovers, Reconciliation of Leases, Bindings, and DHCP Backups.
23. Identify the various methods of DHCP Monitoring, including Scope and Server Statistics on used and available addresses, lease statistics and Performance Monitor Data showing the four steps in obtaining an IP address.
24. Identify Advanced DHCP configurations including installation, configuration, and management of a DHCP Superscope with associated Router Multinet plus the steps for setting up a DHCP Relay Agent.

New Resources for Course

Course Textbooks/Resources

Textbooks

Warren, Andrew. *Networking with Windows Server 2016*, 1st ed. Microsoft, 2017, ISBN: 0-7356-9742-6.

Manuals

Reichert, W. CNT223 Lab Project Manual, Huron River Valley, 10-17-2017

Periodicals

Software

__Equipment/Facilities__

Level III classroom

__Reviewer__	__Action__	__Date__
Faculty Preparer:		
William Reichert	*Faculty Preparer*	*Aug 25, 2017*
Department Chair/Area Director:		
Philip Geyer	*Recommend Approval*	*Sep 18, 2017*
Dean:		
Eva Samulski	*Recommend Approval*	*Sep 19, 2017*
Curriculum Committee Chair:		
Lisa Veasey	*Recommend Approval*	*Nov 28, 2017*
Assessment Committee Chair:		
Michelle Garey	*Recommend Approval*	*Nov 29, 2017*
Vice President for Instruction:		
Kimberly Hurns	*Approve*	*Dec 02, 2017*