

**NETWORK+ CERTIFICATION PREP**

# NET 110 Section: 002

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| --- | --- | --- | --- | --- | --- |
| **Credit Hours:** | 3.00 | **Lab Hours:** | 1.00 | **Lecture Hours:** | 3.00 |
| **IAI Core:** |  | **IAI Majors:** |  | **PCS:** |  |
| **Semester:** | **FALL 2014** | **Course Begins:** | **8/18/14** | **Course Ends:** | **12/11/14** |
| **Days:** | **ONLINE** | **Times:** | **ONLINE** | **Room:** | **ONLINE** |

**Instructor:** Mike J. Tetreault

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**Phone:** 815-455-8730

**Office Hours:** See Canvas

# Office Location: A124

**Other Contact Information:** All communication regarding this class should be done through CANVAS.

**Website (optional):** mchenry.instructure.com

[www.testout.com](http://www.testout.com/)

# Required Course:

**Textbook(s):** Testout LabSim Course

Network Pro ISBN-13: 978-1-935080-43-5

See Canvas for Promotion Code to purchase directly from Testout.com

# Course Description:

Network+ Certification Prep covers intermediate and advanced information on installing, configuring and troubleshooting computer networks. It covers a wide range of material, including local area networks, wide area networks, protocols, topologies, transmission media and security. The course helps prepare students for the industry-endorsed Network+ certification exam offered by the Computing Technology Industry Association (CompTIA). It may be repeated once for a maximum of 6 credit hours. This course was formerly CIS 155 Network Essentials.

# Course Note: This course contains material that is especially challenging and extremely technical. On successful completion of the 16-week course, students should be prepared to take the exam necessary for Network+ certification.

**Course Prerequisite: CDM 110 and CDM 130 and a strong understanding of PC usage and peripherals. Section Notes:**

None

# Course Objectives:

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

* 1. Identify, explain and compare the various types of network topologies
	2. Demonstrate an understanding of network cabling
	3. Identify and contrast various troubleshooting techniques
	4. Compare and contrast various network protocols
	5. Understand the purpose of various network hardware components
	6. Understand the purpose of local area networks

Page **1** of **8**

* 1. Gain an appreciation for nationally based testing criteria
	2. Gain an appreciation for and the uses of various network topologies
	3. Develop an understanding of the importance and use of local area networks
	4. Develop appreciation for constructive reasoning in regards to troubleshooting
	5. Demonstrate a working knowledge of network hardware, topologies, and protocols.
	6. Demonstrate proficiency in identifying network cabling
	7. Demonstrate proficiency in troubleshooting techniques
	8. Demonstrate a proficiency with network monitoring tools
	9. Demonstrate a working knowledge of shared network resources

# Course Outline:

1. Domain 1.0 - Media and Topologies
	1. Recognize the following logical or physical network topologies given a schematic diagram or description
		1. Star/hierarchical
		2. Bus
		3. Mesh
		4. Ring
		5. Wireless
	2. Specify the main features of 802.2 (LLC), 802.3 (Ethernet), 802.5 (token ring),802.11b (wireless) and FDDI networking technologies, including
		1. Speed
		2. Access
		3. Method
		4. Topology
		5. Media
	3. Specify the characteristics (e.g., speed, length, topology, cable type, etc.)of the following
	4. (Ethernet) standards
		1. 10BASE-T
		2. 100BASE-TX
		3. 10BASE2
		4. 10BASE5
		5. 100BASE-FX
		6. Gigabit Ethernet
	5. Recognize the following media connectors and/or describe their uses
		1. RJ-11
		2. RJ-45
		3. AUI
		4. BNC
		5. ST
		6. SC
	6. Choose the appropriate media type and connectors to add a client to an existing network.
	7. Identify the purpose, features, and functions of the following network components
		1. CS/DSU
		2. Network Interface Cards/ISDN adapters/system area network cards
		3. Wireless access points
		4. Modems
2. Domain 2.0 Protocols and Standards
	1. Given an example identify a MAC address
	2. Identify the seven layers of the OSI model and their functions
	3. Differentiate between the following network protocols in terms of routing, addressing schemes, interoperability, and naming conventions
		1. TCP/IP
		2. IPX/SPX
		3. NetBEUI
		4. AppleTalk
	4. Identify the OSI layers at which the following network components operate
		1. Hubs
		2. Switches
		3. Bridges
		4. Routers
		5. Network Interface Cards
	5. Define the purpose, function and/or use of the following protocols within TCP/IP
		1. IP
		2. TCP
		3. UDP
		4. FTP
		5. TFTP
		6. SMTP
		7. HTTP
		8. HTTPS
		9. POP3/IMAP4
		10. TELNET
		11. ICMP
		12. ARP
		13. NTP
	6. Define the function of TCP/UDP ports. Identify well-known ports
	7. Identify the purpose of the following network services (e.g. DHCP/bootp, DNS, NAT/ICS, WINS, and SNMP)
	8. Identify IP addresses (Ipv4, Ipv6) and their default subnet masks.
	9. Identify the purpose of subnetting and default gateways.
	10. Identify the differences between public vs. private networks
	11. Identify the basic characteristics (e.g., speed, capacity, media) of the following WAN technologies
		1. Packet switching vs. circuit switching
		2. ISDN
		3. FDDI
		4. ATM
		5. Frame Relay
		6. Sonet/SDH
		7. T1/E1
		8. T3/E3
		9. Ocx
	12. Define the function of the following remote access protocols and services
		1. RAS
		2. PPP
		3. PPTP
		4. ICA
	13. Identify the following security protocols and describe their purpose and function
		1. Ipsec
		2. L2TP
		3. SSL
		4. Kerberos
3. Domain 3.0 Network Implementation
	1. Identify the basic capabilities (i.e. client support, interoperability, authentication, file and print services, application support, and security) of the following server operating systems
		1. UNIX/Linux
		2. Netware C. Windows Macintosh
	2. Identify the basic capabilities of client workstations (i.e., client connectivity, local security mechanisms, and authentication)
	3. Identify the main characteristics of VLANs
	4. Identify the main characteristics of network attached storage
	5. Identify the purpose and characteristics of fault tolerance
	6. Identify the purpose and characteristics of disaster recovery
	7. Given a remote connectivity scenario (e.g., IP, IPX, dial-up, PPPoE, authentication, physical connectivity etc.), configure the connection.
	8. Identify the purpose, benefits and characteristics of using a firewall.
	9. Identify the purpose, benefits and characteristics of using a proxy.
	10. Given a scenario, predict the impact of a particular security implementation on network functionality (e.g. blocking port numbers, encryption, etc.)
	11. Given a network configuration, select the appropriate NIC and network configuration settings (DHCP, DNS, WINS, protocols, NETBIOS/host name, etc.).
4. Domain 4.0 Network Support
	1. Given a troubleshooting scenario, select the appropriate TCP/IP utility from among the following
		1. Tracert
		2. Ping
		3. Arp
		4. Netstat
		5. Nbtstat
		6. Ipconfig/Ifconfig
		7. Winipcfg
		8. Nslookup
	2. Given a troubleshooting scenario involving a small office/home office networkfailure (e.g., xDSL, cable, home satellite, wireless, POTS), identify the cause of the failure.
	3. Given a troubleshooting scenario involving a remote connectivity problem (e.g., authentication failure, protocol configuration, physical connectivity) identify the cause of the problem.
	4. Given specific parameters, configure a client to connect to the following servers
		1. UNIX/Linux
		2. Netware
		3. Windows
		4. Macintosh
	5. Given a wiring task, select the appropriate tool (e.g., wire crimper, media tester/certifier, punch down tool, tone generator, optical tester, etc.).
	6. Given a network scenario interpret visual indicators (e.g., link lights, collision lights, etc.) to determine the nature of the problem.
	7. Given output from a diagnostic utility (e.g. tracert, ping, ipconfig, etc.), identify the utility and interpret the output.
	8. Given a scenario, predict the impact of modifying, adding, or removing network services (e.g., DHCP, DNS, WINS, etc.) on network resources and users
	9. Given a network problem scenario, select an appropriate course of action based on a general troubleshooting strategy. This strategy includes the following steps
		1. Establish the symptoms
		2. Identify the affected area
		3. Establish what has changed
		4. Select the most probable cause
		5. Implement a solution
		6. Test the result
		7. Recognize the potential effects of the solution
		8. Document the solution
	10. Given a troubleshooting scenario involving a network with a particular physical topology (i.e., bus, star/hierarchical, mesh, ring, and wireless) and including a network diagram, identify the network area affected and the cause of the problem.
	11. Given a network troubleshooting scenario involving a client connectivity problem (e.g., incorrect protocol/client software/authentication configuration, or insufficient rights/permission), identify the cause of the problem.

# Assignments and Grading Criteria

Final grades are determined through a weighted average based on the following categories:

|  |  |
| --- | --- |
| TestOut LabSim Videos | 10% |
| TestOut LabSim Labs | 25% |
| TestOut LabSim Exams | 25% |
| Final Exams | 40% |
|  | 100% |

After your numerical grade has been calculated, your letter grade will be determined as follows:

A 90–100% of weighted grade B 80–89% of weighted grade C 70–79% of weighted grade D 60–69% of weighted grade

F Less than 60% of weighted grade

# Policies

**Attendance policy:** This is an online course. Attendance is not part of the grade for this class. You should login to CANVAS regularly to check for announcements from the instructor.

**Late work/make-up policy:** I do not accept late work. There are no exceptions to the course schedule.

**Cheating:** Cheating on Tests or Assignments will not be tolerated. If any student is caught cheating on a Test or Assignment they will automatically fail the course. This includes submitting another student’s assignment or allowing another student to submit their assignment.

# Weekly Course Schedule

|  |  |  |
| --- | --- | --- |
|  | **Start -- End** | **Course Schedule** |
| Week #1 | 08/18/14 – 08/24/14 | Course Setup |
| Week #2 | 08/25/14 – 08/31/14 | Module 00: Introduction |
| Week #3 | 09/01/14 – 09/07/14 | Module 01: Networking Basics |
| Week #4 | 09/08/14 – 09/14/14 | Module 02: Cables and Connectors |
| Week #5 | 09/15/14 – 09/21/14 | Module 03: Networking Devices |
| Week #6 | 09/22/14 – 09/28/14 | Module 04: Ethernet |
| Week #7 | 09/29/14 – 10/05/14 | Module 05: Network Implementation |
| Week #8 | 10/06/14 – 10/12/14 | Module 05: Network Implementation |
| Week #9 | 10/13/14 – 10/19/14 | Module 06: Wireless Networking |
| Week #10 | 10/20/14 – 10/26/14 | Module 07: Wide Area Networks (WANs) |
| Week #11 | 10/27/14 – 11/02/14 | Module 08: Network Security |
| Week #12 | 11/03/14 – 11/09/14 | Module 08: Network Security |
| Week #13 | 11/10/14 – 11/16/14 | Module 09: Network Management |
| Week #14 | 11/17/14 – 11/23/14 | Module 10: Troubleshooting |
| **NO CLASS** | **11/24/14 – 11/30/14** | **THANKSGIVING BREAK** |
| Week #15 | 12/01/14 – 12/07/14 | Module 10: Troubleshooting |
| Week #16 | 12/08/14 – 12/11/14 | Practice Exams |

**Withdrawals:** The last day to drop this course is **11/12/14.** Failure to attend class does not constitute official withdrawal. If students are considering a withdrawal, they should consult directly with the instructor and an academic advisor. Students may withdraw from a class through the Registration Office, either in person or by fax: (815) 455-3766. In their request, students should include their name, student ID number, course prefix, number and section, course title, instructor, reason for withdrawing, and their signature. Withdrawal from a course will not be accepted over the telephone.

Please refer to the following link for other important college dates: [www.mchenry.edu/academiccalendar.asp](http://www.mchenry.edu/academiccalendar.asp)

# General Education Goals:

1. Critical Thinking: To identify, define, analyze, synthesize, interpret, and evaluate ideas.
2. Information Literacy: To locate, evaluate, and use resources effectively.
3. Effective Communication: To develop, articulate, and convey meaning.
4. Ethical Awareness: To identify and make responsible choices in a diverse world.
5. Technological Literacy: To use tools skillfully.

# Assessment:

Some student work may be collected for the purpose of assessment, including student competency in the general education goals, the program, or the course.

# Effective Fall 2014: Student E-Portfolio:

The instructor of the course will designate at least one graded assignment for possible inclusion in the student E-portfolio. Students applying for an AA, AS, AFA, AES, or AGE degree must document their learning outcomes with a graded assignment for each of the five general education goals by the time of graduation. These five assignments and a cover letter will be in the student E-portfolio in Canvas.

# Academic Support for Special Populations Students

McHenry County College offers support services for students with special needs. It is the student's responsibility to meet with the Special Needs Coordinator and provide current documentation regarding his/her disability and receive information about the accommodations that are available.

In addition, as a student enrolled in a career or technical education program at McHenry County College, you may be eligible for services and assistance under the Carl D. Perkins III Grant. Grant funds are used, in part, to assist students who are at risk of not succeeding in their educational pursuits.

The traits that often prevent students from succeeding are: economic disadvantage, academic disadvantage, disability/disabilities, single parent, displaced homemaker, nontraditional, and limited English proficiency (LEP). The definitions of each trait are available in the Special Needs Office. Students with one or more of these traits are referred to as **Perkins Special Populations Students.**

If you would like to know if you are eligible for services at anytime during the semester, please do not hesitate to contact the Special Needs Coordinator. The office is Room A260, and phone number is (815) 455-8676.

# Academic Integrity

As an educational community, McHenry County College values the pursuit of academic excellence and integrity. In accordance with this philosophy and Chapter 10, Act 5 of the 1994 Illinois Community College Act, academic dishonesty in any form, including cheating, plagiarism, and all other acts of academic theft, is considered intolerable. Appropriate sanctions, up to and including suspension from the College will be imposed by authorized College personnel.

# Copyright Policy

MCC will maintain current procedures and guidelines to ensure that all staff and students comply with applicable copyright laws and other intellectual property protection laws. The College will encourage staff and students to engage in the development of intellectual property and facilitate ownership protections with respect to such development of intellectual property.

The College expects that staff and students will act responsibly and ethically in a manner consistent with all copyright laws and College copyright procedures and guidelines. This policy authorizes the College to adopt and maintain such procedures and guidelines necessary to ensure compliance with copyright laws and to facilitate ownership protection with respect to the development of intellectual property.

# Student Code of Conduct and the Judicial Process

Consistent with the MCC mission is an expectation that students will govern themselves in terms of appropriate behavior with emphasis on self-respect and respect for others. It is the practice of the College to respect the properly exercised rights of its students. The College recognizes a student’s rights within the institution to freedom of speech, inquiry and assembly; to the peaceful pursuit of education; and to the reasonable use of services and facilities at MCC.

MCC has adopted a Student Code of Conduct and judicial process to maintain a learning environment of respect, civility, safety, and integrity for all members of the MCC community.

Whenever possible, sanctions for violations of the Student Code of Conduct may be educational in nature. However, violations affecting the health and safety of members of the MCC community are deemed to be the most serious. Therefore, acts of violence, threats or dangerous behavior are most likely to result in a suspension from the College. Violations of the academic dishonesty policy may also result in suspension or expulsion from the institution and/or reduced or failing grade.

# Children on Campus

For the safety of children on campus, children (i.e., less than 16 years of age) are not permitted on campus unattended by a parent/guardian, except when they are attending classes offered by MCC for children. The College requires that no children be allowed into a classroom/laboratory environment, including the Testing Center, Learning Center and computer labs, solely for the purpose of a parent/guardian to provide direct supervision of his/her child.

# Teaching Schedule

The scheduling of the activities and teaching strategies on this syllabus, but not the objectives or content, may be altered at any time at the discretion of the instructor.

# Resources

The following are useful resources available to you as a student at McHenry County College:

**Advising and Transfer Center: Phone (815) 479-7565; Office A257** [www.mchenry.edu/atc](http://www.mchenry.edu/ATC/Index.asp)

# Counseling:

**Phone (815) 455-8765; Office A257**

[www.mchenry.edu/counseling](http://www.mchenry.edu/counseling)

# Financial Aid:

**Phone (815) 455-8761; Office A262**

[www.mchenry.edu/financialaid](http://www.mchenry.edu/financialaid)

# Library:

**Phone (815) 455-8533; Office A212**

[www.mchenry.edu/library](http://www.mchenry.edu/library)

# Special Needs:

**Phone (815) 455-8676; Office A260**

[www.mchenry.edu/specialneeds](http://www.mchenry.edu/specialneeds)

# Tutoring and Study Skills (Sage Learning Center):

**Phone (815) 455-8579; Office A247**

[www.mchenry.edu/sage](http://www.mchenry.edu/sage)

This workforce solution was funded by a grant awarded by the U.S. Department of Labor’s Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timelines, usefulness, adequacy, continued availability, or ownership. This solution is copyrighted by the institution that created it. Internal use, by an organization and/or personal use by an individual for non-commercial purposes, is permissible. All other uses require the prior authorization of the copyright holder.