# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** L3000 INTRODUCTION TO NETWORKS AND NETWORK BASICS
**Number:** L3000 **Hours:** 120.00
**Dates:** Spring 2025

**Description/Objectives:**

The Cisco Academy Level 1 Curriculum: Student will know and understand the OSI Model and how it applies to networking. The student will understand and be able to setup an IP addressing scheme and subnet a network.

**Tasks:**

L3001- Understand and describe the devices and services used to support communications in data networks and the Internet

L3002- Understand and describe the role of protocol layers in data networks

L3003- Understand and describe the importance of addressing and naming schemes at various layers of data networks in IPv4 and IPv6 environments

L3004- Design, calculate, and apply subnet masks and addresses to fulfill given requirements in IPv4 and IPv6 networks

L3005- Explain fundamental Ethernet concepts such as media, services, and operations

L3006- Build a simple Ethernet network using routers and switches

L3007- Use Cisco command-line interface (CLI) commands to perform basic router and switch configurations

L3008- Utilize common network utilities to verify small network operations and analyze data traffic

**Standards / Assessment Anchors**

*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
CRAFT & STRUCTURE GRADES 9-10-11-12
Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.
Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author’s purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.

INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author's claim for solving a technical problem.
Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.
INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12
Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

*Focus Anchor/Standard #2:*

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

  *Supporting Anchor/Standards:*

  TEXT TYPES AND PURPOSE GRADES 9-10-11-12
  Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.
  Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.
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  Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.
  RESEARCH GRADES 9-10-11-12
  Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.
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*Connecting Anchor/Standard:*

- Pennsylvania Core Standards for Mathematics Standard 2.0

  *Supporting Anchor/Standards:*

  NUMBERS AND OPERATIONS
  Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.

Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.
Standard 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers

**Instructional Activities:**

Knowledge:
Complete textbook assignment(s)
Complete computer assignment(s) as needed
Complete laboratory activity and associated worksheet assignment
Complete activities assigned for TestOut-LabSim
Participate in theory lesson and respond to questions
Participate in group activities according to specific content assignment
Take notes during theory lesson and keep a notebook
Complete Study Guide according to instructions

Skill:
Complete laboratory activity and associated worksheet assignment
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Complete tutorial software assignments
Install and configure a hub, switch, and router
Install, configure, and secure a wireless network

Remediation:
Make corrections to graded work
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Study groups
Review games
Reading comprehension packets
Placing events in a time line
Create a chart
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction
Checklists

Enrichment:
Research an approved topic
Do live work
Use TestOut for review
Conduct a safety review of the laboratory area and classroom
Live work

**Special Adaptations:**

- Extended Time (assignments and/or testing)
- Graphic Organizer
- Chunking of Assignments/Material
- Preferential Seating
- Directions/Comprehension Check (frequent checks for understanding)

- Study Guide
- Directions and/or Tests Read Aloud
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- Teacher Modeling
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- Provide Frequent Feedback
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- Highly Structured Classroom
- Syllabus for Major Projects
- Grading Rubric
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- Testing - Allow Dictation of Lengthy Answers
- Monitor Speed/Accuracy in which Student Completes Assignment
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- Encouragement to Participate in Positive Leadership Roles
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**Safety:**

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Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times
Follow proper classroom procedures

**Assessment:**

TestOut Test
Worksheets
Quizzes
Pre/Post Tests
Essays
Focused Free Write
Summaries
Log/Journal
Time Cards
Writing Activities
Video/DVD Worksheets
Rubrics
Check Lists
Role-play Activities
Debates
Oral Presentation
Group Projects
Research Papers
Current Events
Any content related assessment
Portfolio

**Resources/Equipment:**

MSDS binder

Wireless Router

Cisco Routers

Cisco Switches

Fire extinguisher

Internet access

Whiteboard

LCD Projector

Personal Computers

Laptops

Cisco Routers

Cisco Firewall

Switch Hub

PC Toolkit

Antistatic Wriststrap

Multimeter Cable Tester

Cable Termination Kit

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www.schoology.com

www.netacad.com

www.testout.com

www.professormesser.com

platform.CompTIA.org

www.Cyber.org

# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** L1200 ROUTING AND SWITCHING ESSENTIALS
**Number:** L1200 **Hours:** 120.00
**Dates:** Spring 2025

**Description/Objectives:**

The Cisco Academy Level 2 Curriculum: Student will know and be able to configure and troubleshoot Cisco routers using static routes and routing protocols.

**Tasks:**

L1201- Understand and describe basic switching concepts and the operation of Cisco switches.

L1202- Understand and describe enhanced switching technologies such as VLANs, VLAN Trunking Protocol (VTP), Rapid Spanning Tree Protocol (RSTP), Per VLAN Spanning Tree Protocol (PVSTP), and 802.1q

L1203- Configure and troubleshoot basic operations of a small switched network

L1204- Understand and describe the purpose, nature, and operations of a router, routing tables, and the route lookup process

L1205- Configure and verify static routing and default routing

L1206- Understand and describe how VLANs create logically separate networks and how routing occurs between them

L1207- Understand and describe dynamic routing protocols, distance vector routing protocols, and link-state routing protocols.

L1208- Configure and troubleshoot basic operations of routers in a small routed network.

L1209- Configure and troubleshoot VLANs and inter-VLAN routing.

L1210- Understand and describe the purpose and types of access control lists (ACLs).

L1211- Configure, monitor, and troubleshoot ACLs for IPv4 and IPv6.

L1212- Understand and describe the operations and benefits of Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS) for IPv4 and IPv6.

L1213- Understand and describe the operations and benefits of Network Address Translation (NAT).

L1214- Configure and troubleshoot NAT operations.

**Standards / Assessment Anchors**

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**Assessment:**

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Quizzes
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Time Cards
Writing Activities
Video/DVD Worksheets
Rubrics
Check Lists
Role-play Activities
Debates
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Group Projects
Research Papers
Current Events
Any content related assessment
Portfolio

**Resources/Equipment:**

MSDS binder

Wireless Router

Cisco Routers

Cisco Switches

Fire extinguisher

Internet access

Whiteboard

LCD Projector

Personal Computers

Laptops

Cisco Routers

Cisco Firewall

Switch Hub

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www.schoology.com

www.netacad.com

www.testout.com

www.professormesser.com

platform.CompTIA.org

www.Cyber.org

# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** L1300 SCALING NETWORKS
**Number:** L1300 **Hours:** 180.00
**Dates:** Spring 2025

**Description/Objectives:**

The Cisco Academy Level 3 Curriculum: Student will know and be able to configure and troubleshoot Cisco switches using VLANs. Student will know and be able to configure and secure small wireless networks. Student will understand and be able to configure and troubleshoot DHCP and DNS operations.

**Tasks:**

L1301- Configure and troubleshoot DHCP and DNS operations for IPv4 and IPv6.

L1302- Understand and describe the operations and benefits of the Spanning Tree Protocol (STP).

L1303- Configure and troubleshoot STP operations.

L1304- Understand and describe the operations and benefits of link aggregation and Cisco VLAN Trunk Protocol (VTP).

L1305- Configure and troubleshoot VTP, STP, and RSTP.

L1306- Configure and troubleshoot basic operations of routers in a complex routed network for IPv4 and IPv6.

L1307- Configure and troubleshoot advanced operations of routers and implement RIP, OSPF, and EIGRP routing protocols for IPv4 and IPv6.

L1308- Manage Cisco IOS Software licensing and configuration files.

**Standards / Assessment Anchors**

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  *Supporting Anchor/Standards:*

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Peer tutoring
Study groups
Review games
Reading comprehension packets
Placing events in a time line
Create a chart
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction
Checklists

Enrichment:
Research an approved topic
Do live work
Use TestOut for review
Conduct a safety review of the laboratory area and classroom
Live work

**Special Adaptations:**

- Extended Time (assignments and/or testing)
- Graphic Organizer
- Chunking of Assignments/Material
- Preferential Seating
- Directions/Comprehension Check (frequent checks for understanding)
- Study Guide
- Directions and/or Tests Read Aloud

- Adapted Tests and/or Assignments
- Use of Calculator
- Taking Tests in Alternate Setting (or if requested)
- Verbal/Gestural Redirection (prompts to remain on task)
- Drill and Practice (Repetition of Material)
- No Penalization for Spelling
- Copy of Teacher/Student Notes/Skeleton Notes
- Small Group Instruction
- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)
- Use of Daily Planner/Assignment Book (monitor use of)
- Teacher Modeling
- Use of Computer (Access to)
- Wait Time
- Access to School Counselor
- Use of Highlighter/Highlighted Text
- Provide Frequent Feedback
- Variety of Assessment Methods
- Use of Assistive Device (i.e. notepad, laptop, ect.)
- Highly Structured Classroom
- Syllabus for Major Projects
- Grading Rubric
- Communication Regarding Behavior & Consequences (PBS)
- Clear Language for Directions
- Use of Multisensory Approach
- Provide Opportunities to Retest
- Frequent Review Sessions
- Use a variety of Modalities when Introducing Skills/Concepts
- Books on Tape or CD
- Allow Oral Answers for Testing
- Provide Editing Assistance
- Copies of Text for Home
- De-Escalation Opportunities
- Cue for Oral Response
- Text to Speech (other than for NOCTI)
- Daily Classwork Check
- Encourage Student to Check Work Before Turning In
- Opportunities for Repeated Practice of MATH Skills
- Provide repetition During Initial Instruction
- Provide Verbal and Written Directions
- All Vocabulary to be Defined Before Testing
- Testing - Allow Dictation of Lengthy Answers
- Monitor Speed/Accuracy in which Student Completes Assignment
- Access to Closed Captioning as Available (upon request)
- Encouragement to Participate in Positive Leadership Roles
- Student Self-Evaluation for Behavior
- Exempt from reading Aloud in Front of Peers

**Safety:**

Student must:
Use computer equipment in an ergonomic fashion
Handle material in a safe and work like manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times
Follow proper classroom procedures

**Assessment:**

TestOut Test
Worksheets
Quizzes
Pre/Post Tests
Essays
Focused Free Write
Summaries
Log/Journal
Time Cards
Writing Activities
Video/DVD Worksheets
Rubrics
Check Lists
Role-play Activities
Debates
Oral Presentation
Group Projects
Research Papers
Current Events
Any content related assessment
Portfolio

**Resources/Equipment:**

MSDS binder

Wireless Router

Cisco Routers

Cisco Switches

Fire extinguisher

Internet access

Whiteboard

LCD Projector

Personal Computers

Laptops

Cisco Routers

Cisco Firewall

Switch Hub

PC Toolkit

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# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** L1400 CONNECTING NETWORKS
**Number:** L1400 **Hours:** 180.00
**Dates:** Spring 2025

**Description/Objectives:**

The Cisco Academy Level 4 Curriculum: Student will know and be able to configure, troubleshoot, and secure WAN connections.

**Tasks:**

L1401- Understand and describe different WAN technologies and their benefits

L1402- Understand and describe the operations and benefits of virtual private networks (VPNs) and tunneling

L1403- Configure and troubleshoot serial connections

L1404- Configure and troubleshoot broadband connections

L1405- Configure and troubleshoot IPSec tunneling operations

L1406- Monitor and troubleshoot network operations using syslog, SNMP, and NetFlow

L1407- Design network architectures including Borderless networks, Data centers and virtualization, and Collaboration technology and solutions.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

  *Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
CRAFT & STRUCTURE GRADES 9-10-11-12
Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.
Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author’s purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.
INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author’s claim for solving a technical problem.
Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other

sources, etc.
INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12
Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

*Focus Anchor/Standard #2:*

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

*Supporting Anchor/Standards:*

TEXT TYPES AND PURPOSE GRADES 9-10-11-12
Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.
Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.
PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12
Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.
Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.
RESEARCH GRADES 9-10-11-12
Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.
Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.
Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.
RANGE OF WRITING GRADES 9-10-11-12
Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

*Connecting Anchor/Standard:*

- Pennsylvania Core Standards for Mathematics Standard 2.0

*Supporting Anchor/Standards:*

NUMBERS AND OPERATIONS
Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.
Standard 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers

**Instructional Activities:**

Knowledge:
Complete textbook assignment(s)
Complete computer assignment(s) as needed
Complete laboratory activity and associated worksheet assignment
Complete activities assigned for TestOut-LabSim
Participate in theory lesson and respond to questions
Participate in group activities according to specific content assignment
Take notes during theory lesson and keep a notebook
Complete Study Guide according to instructions

Skill:
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Complete activities assigned for TestOut-LabSim
Complete tutorial software assignments
Install and configure a hub, switch, and router
Install, configure, and secure a wireless network

Remediation:
Make corrections to graded work
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Study groups
Review games
Reading comprehension packets
Placing events in a time line
Create a chart
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction
Checklists

Enrichment:
Research an approved topic
Do live work
Use TestOut for review
Conduct a safety review of the laboratory area and classroom
Live work

**Special Adaptations:**

- Extended Time (assignments and/or testing)
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- Directions and/or Tests Read Aloud
- Adapted Tests and/or Assignments
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- Grading Rubric
- Communication Regarding Behavior & Consequences (PBS)
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**Assessment:**

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Quizzes
Pre/Post Tests

Essays
Focused Free Write
Summaries
Log/Journal
Time Cards
Writing Activities
Video/DVD Worksheets
Rubrics
Check Lists
Role-play Activities
Debates
Oral Presentation
Group Projects
Research Papers
Current Events
Any content related assessment
Portfolio

**Resources/Equipment:**

MSDS binder

Wireless Router

Cisco Routers

Cisco Switches

Fire extinguisher

Internet access

Whiteboard

LCD Projector

Personal Computers

Laptops

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# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** L1500 COMPLIANCE AND OPERATIONAL SECURITY
**Number:** L1500 **Hours:** 20.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and understand the concepts of risk, confidentiality, integrity, availability, and environmental controls. Student will know and be able to execute risk mitigation strategies, incidence response procedures, and disaster recovery procedures.

**Tasks:**

L1501- Explain risk related concepts

L1502- Carry out appropriate risk mitigation strategies

L1503- Execute appropriate incident response procedures

L1504- Explain the importance of security related awareness and training

L1505- Compare and contrast aspects of business continuity

L1506- Explain the impact and proper use of environmental controls

L1507- Execute disaster recovery plans and procedures

L1508- Exemplify the concepts of confidentiality, integrity and availability (CIA)

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
CRAFT & STRUCTURE GRADES 9-10-11-12
Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
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INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
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INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
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RANGE OF READING GRADES 9-10-11-12
Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

*Focus Anchor/Standard #2:*

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

*Supporting Anchor/Standards:*

TEXT TYPES AND PURPOSE GRADES 9-10-11-12
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**Instructional Activities:**

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Role-play Activities
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**Resources/Equipment:**

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# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** L1600 THREATS AND VULNERABILITIES
**Number:** L1600 **Hours:** 40.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to analyze different types of malware and computer related attacks. Student will be able to use appropriate tools and techniques to perform vulnerability assessments, discover security threats, and mitigate threats.

**Tasks:**

L1601- Analyze and differentiate among types of malware

L1602- Analyze and differentiate among types of attacks

L1603- Analyze and differentiate among types of social engineering attacks

L1604- Analyze and differentiate among types of wireless attacks

L1605- Analyze and differentiate among types of application attacks

L1606- Analyze and differentiate among types of mitigation and deterrent techniques

L1607- Implement assessment tools and techniques to discover security threats and vulnerabilities

L1608- Within the realm of vulnerability assessments, explain the proper use of penetration testing versus vulnerability scanning.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

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*Supporting Anchor/Standards:*

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Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.
Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.
RESEARCH GRADES 9-10-11-12
Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.
Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.
Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.
RANGE OF WRITING GRADES 9-10-11-12
Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

*Connecting Anchor/Standard:*

- Pennsylvania Core Standards for Mathematics Standard 2.0

*Supporting Anchor/Standards:*

NUMBERS AND OPERATIONS
Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.
Standard 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers

**Instructional Activities:**

Knowledge:
Complete textbook assignment(s)
Complete computer assignment(s) as needed
Complete laboratory activity and associated worksheet assignment
Complete activities assigned for TestOut-LabSim
Participate in theory lesson and respond to questions
Participate in group activities according to specific content assignment
Take notes during theory lesson and keep a notebook
Complete Study Guide according to instructions

Skill:
Complete laboratory activity and associated worksheet assignment
Complete activities assigned for TestOut-LabSim
Complete tutorial software assignments
Install and configure a hub, switch, and router
Install, configure, and secure a wireless network

Remediation:
Make corrections to graded work
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Study groups
Review games
Reading comprehension packets
Placing events in a time line
Create a chart
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction
Checklists

Enrichment:
Research an approved topic
Do live work
Use TestOut for review
Conduct a safety review of the laboratory area and classroom
Live work

**Special Adaptations:**

- Extended Time (assignments and/or testing)
- Graphic Organizer
- Chunking of Assignments/Material
- Preferential Seating
- Directions/Comprehension Check (frequent checks for understanding)
- Study Guide
- Directions and/or Tests Read Aloud
- Adapted Tests and/or Assignments
- Use of Calculator
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- Verbal/Gestural Redirection (prompts to remain on task)

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- Teacher Modeling
- Use of Computer (Access to)
- Wait Time
- Access to School Counselor
- Use of Highlighter/Highlighted Text
- Provide Frequent Feedback
- Variety of Assessment Methods
- Use of Assistive Device (i.e. notepad, laptop, ect.)
- Highly Structured Classroom
- Syllabus for Major Projects
- Grading Rubric
- Communication Regarding Behavior & Consequences (PBS)
- Clear Language for Directions
- Use of Multisensory Approach
- Provide Opportunities to Retest
- Frequent Review Sessions
- Use a variety of Modalities when Introducing Skills/Concepts
- Books on Tape or CD
- Allow Oral Answers for Testing
- Provide Editing Assistance
- Copies of Text for Home
- De-Escalation Opportunities
- Cue for Oral Response
- Text to Speech (other than for NOCTI)
- Daily Classwork Check
- Encourage Student to Check Work Before Turning In
- Opportunities for Repeated Practice of MATH Skills
- Provide repetition During Initial Instruction
- Provide Verbal and Written Directions
- All Vocabulary to be Defined Before Testing
- Testing - Allow Dictation of Lengthy Answers
- Monitor Speed/Accuracy in which Student Completes Assignment
- Access to Closed Captioning as Available (upon request)
- Encouragement to Participate in Positive Leadership Roles
- Student Self-Evaluation for Behavior
- Exempt from reading Aloud in Front of Peers

**Safety:**

Student must:
Use computer equipment in an ergonomic fashion
Handle material in a safe and work like manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times
Follow proper classroom procedures

**Assessment:**

TestOut Test
Worksheets

Quizzes
Pre/Post Tests
Essays
Focused Free Write
Summaries
Log/Journal
Time Cards
Writing Activities
Video/DVD Worksheets
Rubrics
Check Lists
Role-play Activities
Debates
Oral Presentation
Group Projects
Research Papers
Current Events
Any content related assessment
Portfolio

**Resources/Equipment:**

MSDS binder

Wireless Router

Cisco Routers

Cisco Switches

Fire extinguisher

Internet access

Whiteboard

LCD Projector

Personal Computers

Laptops

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# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** L1700 APPLICATION, DATA AND HOST SECURITY
**Number:** L1700 **Hours:** 20.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to implement application security. The student will be able to secure a host computer.

**Tasks:**

L1701- Explain the importance of application security

L1702- Carry out appropriate procedures to establish host security

L1703- Explain the importance of data security

**Standards / Assessment Anchors**

*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
CRAFT & STRUCTURE GRADES 9-10-11-12
Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.
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INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
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INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12
Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

*Focus Anchor/Standard #2:*

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

  *Supporting Anchor/Standards:*

  TEXT TYPES AND PURPOSE GRADES 9-10-11-12
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Enrichment:
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**Special Adaptations:**

- Extended Time (assignments and/or testing)
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- Variety of Assessment Methods
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- Syllabus for Major Projects
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- Communication Regarding Behavior & Consequences (PBS)
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**Assessment:**

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Debates
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**Resources/Equipment:**

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# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** L1800 ACCESS CONTROL AND IDENTITY MANAGEMENT
**Number:** L1800 **Hours:** 20.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to implement appropriate security controls related to authentication and account management.

**Tasks:**

L1801- Explain the function and purpose of authentication services

L1802- Explain the fundamental concepts and best practices related to authentication, authorization and access control

L1803- Implement appropriate security controls when performing account management

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
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  *Supporting Anchor/Standards:*

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# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** L1900 CRYPTOGRAPHY
**Number:** L1900 **Hours:** 20.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to implement appropriate types of cryptography, PKI and certificate management.

**Tasks:**

L1901- Summarize general cryptography concepts

L1902- Use and apply appropriate cryptographic tools and products

L1903- Explain the core concepts of public key infrastructure

L1904- Implement PKI, certificate management and associated components

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

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*Supporting Anchor/Standards:*

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Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.
INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12
Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and

comprehend technical texts independently and proficiently.

*Focus Anchor/Standard #2:*

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

  *Supporting Anchor/Standards:*

  TEXT TYPES AND PURPOSE GRADES 9-10-11-12
  Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.
  Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.
  PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12
  Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.
  Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
  Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.
  RESEARCH GRADES 9-10-11-12
  Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.
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  Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.
  RANGE OF WRITING GRADES 9-10-11-12
  Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

*Connecting Anchor/Standard:*

- Pennsylvania Core Standards for Mathematics Standard 2.0

  *Supporting Anchor/Standards:*

  NUMBERS AND OPERATIONS
  Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
  Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.
  Standard 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
  Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers

**Instructional Activities:**

Knowledge:
Complete textbook assignment(s)
Complete computer assignment(s) as needed
Complete laboratory activity and associated worksheet assignment
Complete activities assigned for TestOut-LabSim
Participate in theory lesson and respond to questions
Participate in group activities according to specific content assignment
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Complete Study Guide according to instructions

Skill:
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Complete tutorial software assignments
Install and configure a hub, switch, and router
Install, configure, and secure a wireless network

Remediation:
Make corrections to graded work
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Study groups
Review games
Reading comprehension packets
Placing events in a time line
Create a chart
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction
Checklists

Enrichment:
Research an approved topic
Do live work
Use TestOut for review
Conduct a safety review of the laboratory area and classroom
Live work

**Special Adaptations:**

- Extended Time (assignments and/or testing)
- Graphic Organizer
- Chunking of Assignments/Material
- Preferential Seating
- Directions/Comprehension Check (frequent checks for understanding)
- Study Guide
- Directions and/or Tests Read Aloud
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- Wait Time
- Access to School Counselor
- Use of Highlighter/Highlighted Text
- Provide Frequent Feedback
- Variety of Assessment Methods
- Use of Assistive Device (i.e. notepad, laptop, ect.)

- Highly Structured Classroom
- Syllabus for Major Projects
- Grading Rubric
- Communication Regarding Behavior & Consequences (PBS)
- Clear Language for Directions
- Use of Multisensory Approach
- Provide Opportunities to Retest
- Frequent Review Sessions
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- Books on Tape or CD
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- De-Escalation Opportunities
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- All Vocabulary to be Defined Before Testing
- Testing - Allow Dictation of Lengthy Answers
- Monitor Speed/Accuracy in which Student Completes Assignment
- Access to Closed Captioning as Available (upon request)
- Encouragement to Participate in Positive Leadership Roles
- Student Self-Evaluation for Behavior
- Exempt from reading Aloud in Front of Peers

**Safety:**

Student must:
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Handle material in a safe and work like manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times
Follow proper classroom procedures

**Assessment:**

TestOut Test
Worksheets
Quizzes
Pre/Post Tests
Essays
Focused Free Write
Summaries
Log/Journal
Time Cards
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Any content related assessment
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**Resources/Equipment:**

MSDS binder

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Cisco Routers

Cisco Switches

Fire extinguisher

Internet access

Whiteboard

LCD Projector

Personal Computers

Laptops

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www.netacad.com

www.testout.com

www.professormesser.com

# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** L2000 USE PRODUCTIVITY SOFTWARE
**Number:** L2000 **Hours:** 20.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to create, format, edit, export, and print word processing, spreadsheet, and presentation documents.

**Tasks:**

L2001- List and describe several common application software suites.

L2002- Create, format, and edit word processing documents.

L2003- Create, format, and edit spreadsheets documents.

L2004- Create, format, and edit a presentation using multimedia software

L2005- Present a multimedia presentation

L2006- Demonstrate the ability to save, export, and print documents using applications software.

L2007- Use the appropriate tools to create and manipulate images in application software documents.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

  *Supporting Anchor/Standards:*
  KEY IDEAS/DETAILS GRADES 9-10-11-12
  Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
  Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
  Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
  CRAFT & STRUCTURE GRADES 9-10-11-12
  Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
  Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.
  Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author’s purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.
  INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
  Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
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*Focus Anchor/Standard #2:*

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  *Supporting Anchor/Standards:*

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Checklists

Enrichment:
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**Special Adaptations:**

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**Assessment:**

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Focused Free Write
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**Resources/Equipment:**

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Cisco Routers

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# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** L2100 DATABASE ADMINISTRATION
**Number:** L2100 **Hours:** 10.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to create and maintain a database. Student will understand how to create queries and reports.

**Tasks:**

L2101- Demonstrate a working knowledge of database design fundamentals and terminology

L2102- Enter, update and maintain databases.

L2103- Create reports, forms and combo boxes.

L2104- Import and Export data into other applications.

L2105- Create data queries using simple and complex structured query language

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

*Supporting Anchor/Standards:*

3.4.10.C1 Apply the components of the technological design process.
3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.4.10.A1 Illustrate how the development of technologies is often driven by profit and an economic market.

*Focus Anchor/Standard #2:*

- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

*Supporting Anchor/Standards:*

CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience
CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes
CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.

CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.

*Connecting Anchor/Standard:*

- CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.

  *Supporting Anchor/Standards:*

  CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
  CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.
  CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
  CC.2.3.8.A.1 Apply the concepts of volume of cylinders, cones, and spheres to solve real-world and mathematical problems.
  CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

**Instructional Activities:**

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# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** L2200 FUNDAMENTALS OF PROGRAMMING / SYSTEM DEVELOPMENT
**Number:** L2200 **Hours:** 20.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to create, maintain, troubleshoot, and document basic programs. Student will understand the software development life cycle and the differences between types of code.

**Tasks:**

L2201 - Describe a working knowledge of the System Development LifeCycle (System investigation/project proposal, Analysis, Design, Code/Test, Implementation and Maintenance).

L2202 - Differentiate programming fundamentals - system processing, integration, generations of languages, binary code, object code, source code

L2203 - Declare and manipulate appropriate data types variables, such as arrays and string data.

L2204 - Utilize program control structures (for example: decisions, loops, functions/subroutines, arithmetic and logical operations, etc.)

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
CRAFT & STRUCTURE GRADES 9-10-11-12
Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.
Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author’s purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.
INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author’s claim for solving a technical problem.
Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.
INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12

Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

*Focus Anchor/Standard #2:*

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

  *Supporting Anchor/Standards:*

  TEXT TYPES AND PURPOSE GRADES 9-10-11-12
  Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.
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  Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.
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*Connecting Anchor/Standard:*

- Pennsylvania Core Standards for Mathematics Standard 2.0

  *Supporting Anchor/Standards:*

  NUMBERS AND OPERATIONS
  Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
  Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.
  Standard 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
  Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers

**Instructional Activities:**

Knowledge:
Complete textbook assignment(s)
Complete computer assignment(s) as needed
Complete laboratory activity and associated worksheet assignment
Complete activities assigned for TestOut-LabSim
Participate in theory lesson and respond to questions

Participate in group activities according to specific content assignment
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Install and configure a hub, switch, and router
Install, configure, and secure a wireless network

Remediation:
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Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Study groups
Review games
Reading comprehension packets
Placing events in a time line
Create a chart
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction
Checklists

Enrichment:
Research an approved topic
Do live work
Use TestOut for review
Conduct a safety review of the laboratory area and classroom
Live work

**Special Adaptations:**

- Extended Time (assignments and/or testing)
- Graphic Organizer
- Chunking of Assignments/Material
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- Directions/Comprehension Check (frequent checks for understanding)
- Study Guide
- Directions and/or Tests Read Aloud
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- Use of Daily Planner/Assignment Book (monitor use of)
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- Use of Computer (Access to)
- Wait Time
- Access to School Counselor

- Use of Highlighter/Highlighted Text
- Provide Frequent Feedback
- Variety of Assessment Methods
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- Highly Structured Classroom
- Syllabus for Major Projects
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- Testing - Allow Dictation of Lengthy Answers
- Monitor Speed/Accuracy in which Student Completes Assignment
- Access to Closed Captioning as Available (upon request)
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- Student Self-Evaluation for Behavior
- Exempt from reading Aloud in Front of Peers

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Student must:
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Use adequate ventilation when working in enclosed area
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Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times
Follow proper classroom procedures

**Assessment:**

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Quizzes
Pre/Post Tests
Essays
Focused Free Write
Summaries
Log/Journal
Time Cards
Writing Activities
Video/DVD Worksheets
Rubrics

Check Lists
Role-play Activities
Debates
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Group Projects
Research Papers
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Any content related assessment
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**Resources/Equipment:**

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Cisco Routers

Cisco Switches

Fire extinguisher

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Whiteboard

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# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** L2300 DESIGN AND CREATE WEBSITES
**Number:** L2300 **Hours:** 10.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to create, maintain, and critique a website.

**Tasks:**

L2301- Demonstrate proper use of an HTML text editor.

L2302- Create tables and hyperlinks in HTML.

L2303- Apply structural requirements (information architecture) for development of a website.

L2304- Format, edit, and proofread a website.

L2305- Demonstrate publishing, updating, maintaining and testing a website.

L2306- Critique a Web site according to accepted Web site design principles.

L2307- Format and insert multimedia in a webpage

L2308- Demonstrate knowledge of web server technology.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

  *Supporting Anchor/Standards:*
  KEY IDEAS/DETAILS GRADES 9-10-11-12
  Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
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- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

*Supporting Anchor/Standards:*

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**Instructional Activities:**

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Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction
Checklists

Enrichment:
Research an approved topic
Do live work
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Conduct a safety review of the laboratory area and classroom
Live work

**Special Adaptations:**

- Extended Time (assignments and/or testing)
- Graphic Organizer
- Chunking of Assignments/Material
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- Study Guide
- Directions and/or Tests Read Aloud
- Adapted Tests and/or Assignments
- Use of Calculator
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- Use of Computer (Access to)
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- Use of Highlighter/Highlighted Text
- Provide Frequent Feedback
- Variety of Assessment Methods
- Use of Assistive Device (i.e. notepad, laptop, ect.)
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- Syllabus for Major Projects
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Time Cards
Writing Activities
Video/DVD Worksheets
Rubrics
Check Lists
Role-play Activities
Debates
Oral Presentation
Group Projects
Research Papers
Current Events
Any content related assessment
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**Resources/Equipment:**

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Cisco Routers

Cisco Switches

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# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** 100 DEMONSTRATE KNOWLEDGE OF PERSONAL AND ENVIRONMENTAL SAFETY
**Number:** 100 **Hours:** 20.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to follow classroom, industry, and workplace procedures and safety rules.

**Tasks:**

PA101 - List common causes of accidents and injuries in a computer facility.

PA102 - Wear personal protective equipment.

PA103 - List and identify safety hazard symbols.

PA104 - Review Safety Data Sheets (SDS) and explain their requirements in handling hazardous materials.

PA105 - Describe types of fire extinguishers and explain which types to use for extinguishing various fires.

PA106 - Use safe procedures to follow when lifting and carrying heavy objects.

PA107 - Describe the importance of safety as it relates to environmental issues.

PA108 - Identify potential hazards when working with power supplies.

PA109 - Identify proper disposal procedures for batteries, display devices, and all other electronic equipment.

PA110 - Identify proper disposal procedures for chemical solvents and pressurized cans.

PA111 - Prevent electro static discharge conditions.

PA113 - Configure a computer's power management settings to maximize energy efficiency.

PA114 - Maintain safe work area to avoid common accidents and injuries.

**Standards / Assessment Anchors**

*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

  *Supporting Anchor/Standards:*

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Complete Study Guide according to instructions
Demonstrate knowledge of safety information to ninety percent competency

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# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** 200 COMPUTER HARDWARE
**Number:** 200 **Hours:** 180.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to identify, configure, upgrade, troubleshoot, and maintain computer hardware.

**Tasks:**

PA201 - Categorize storage devices and backup media, and RAID

PA202 - Categorize the different types of computer cases.

PA203 - Explain motherboard components, types and features.

PA204 - Categorize power supplies types and characteristics.

PA205 - Explain the purpose and characteristics of CPUs and their features.

PA206 - Explain cooling methods and devices.

PA207 - Compare and contrast memory types, characteristics and their purpose.

PA208 - Distinguish between the different display devices and their characteristics.

PA209 - Summarize the function and types of adapter cards.

PA210 - Install and configure peripherals and input devices.

PA211 - Configure and optimize portable devices such as: laptops, tablets, and smart devices.

PA212 - Install and configure printers.

PA213 - Install configure and maintain personal computer components.

PA214 - Repair/replace desktop and laptop computer components.

**Standards / Assessment Anchors**

*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

  *Supporting Anchor/Standards:*

  KEY IDEAS/DETAILS GRADES 9-10-11-12
  Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
  Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
  Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
  CRAFT & STRUCTURE GRADES 9-10-11-12
  Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
  Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.

Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.
INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author's claim for solving a technical problem.
Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.
INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12
Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

*Focus Anchor/Standard #2:*

- Science, Technology & Engineering, and Environmental Literacy & Sustainability Standards
  3.5.9-12.2 Strand: Applying, Maintaining, and Assessing Technological Products and Systems

  *Supporting Anchor/Standards:*

  3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.

  3.5.9-12.DD Develop a plan that incorporates knowledge from science, mathematics, and other disciplines to design or improve a technological product or system

  3.5.9-12.A Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.

*Connecting Anchor/Standard:*

- Pennsylvania Core Standards for Mathematics Standard 2.0

  *Supporting Anchor/Standards:*

  NUMBERS AND OPERATIONS
  Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
  Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.
  Standard 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
  Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers

**Instructional Activities:**

Knowledge:
Complete textbook assignment(s)
Complete computer assignment(s) as needed
Complete laboratory activity and associated worksheet assignment
Complete activities assigned for TestOut-LabSim
Participate in theory lesson and respond to questions
Participate in group activities according to specific content assignment
Take notes during theory lesson and keep a notebook
Complete Study Guide according to instructions

Skill:

Complete laboratory activity and associated worksheet assignment
Complete activities assigned for TestOut-LabSim
Complete tutorial software assignments
Install and configure storage devices
Configure a RAID array
Install and configure a motherboard, CPU, and RAM
Install and configure a power supply
Install and configure different display devices
Install and configure peripheral devices
Install, configure, and troubleshoot a printer
Disassemble and reassemble a desktop computer
Disassemble and reassemble a laptop

Remediation:
Make corrections to graded work
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Study groups
Review games
Reading comprehension packets
Placing events in a time line
Create a chart
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction
Checklists

Enrichment:
Research an approved topic
Do live work
Use TestOut for review
Conduct a safety review of the laboratory area and classroom
Live work

**Special Adaptations:**

- Extended Time (assignments and/or testing)
- Graphic Organizer
- Chunking of Assignments/Material
- Preferential Seating
- Directions/Comprehension Check (frequent checks for understanding)
- Study Guide
- Directions and/or Tests Read Aloud
- Adapted Tests and/or Assignments
- Use of Calculator
- Taking Tests in Alternate Setting (or if requested)
- Verbal/Gestural Redirection (prompts to remain on task)
- Drill and Practice (Repetition of Material)
- No Penalization for Spelling
- Copy of Teacher/Student Notes/Skeleton Notes
- Small Group Instruction
- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)
- Use of Daily Planner/Assignment Book (monitor use of)
- Teacher Modeling
- Use of Computer (Access to)

- Wait Time
- Access to School Counselor
- Use of Highlighter/Highlighted Text
- Provide Frequent Feedback
- Variety of Assessment Methods
- Use of Assistive Device (i.e. notepad, laptop, ect.)
- Highly Structured Classroom
- Syllabus for Major Projects
- Grading Rubric
- Communication Regarding Behavior & Consequences (PBS)
- Clear Language for Directions
- Use of Multisensory Approach
- Provide Opportunities to Retest
- Frequent Review Sessions
- Use a variety of Modalities when Introducing Skills/Concepts
- Books on Tape or CD
- Allow Oral Answers for Testing
- Provide Editing Assistance
- Copies of Text for Home
- De-Escalation Opportunities
- Cue for Oral Response
- Text to Speech (other than for NOCTI)
- Daily Classwork Check
- Encourage Student to Check Work Before Turning In
- Opportunities for Repeated Practice of MATH Skills
- Provide repetition During Initial Instruction
- Provide Verbal and Written Directions
- All Vocabulary to be Defined Before Testing
- Testing - Allow Dictation of Lengthy Answers
- Monitor Speed/Accuracy in which Student Completes Assignment
- Access to Closed Captioning as Available (upon request)
- Encouragement to Participate in Positive Leadership Roles
- Student Self-Evaluation for Behavior
- Exempt from reading Aloud in Front of Peers

**Safety:**

Student must:
Use computer equipment in an ergonomic fashion
Handle material in a safe and work like manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times
Follow proper classroom procedures

**Assessment:**

TestOut Test
Worksheets
Quizzes
Pre/Post Tests
Essays
Focused Free Write
Summaries
Log/Journal
Time Cards
Writing Activities

Video/DVD Worksheets
Rubrics
Check Lists
Role-play Activities
Debates
Oral Presentation
Group Projects
Research Papers
Current Events
Any content related assessment
Portfolio

**Resources/Equipment:**

MSDS binder

Wireless Router

Cisco Routers

Cisco Switches

Fire extinguisher

Internet access

Whiteboard

LCD Projector

Personal Computers

Laptops

Cisco Routers

Cisco Firewall

Switch Hub

PC Toolkit

Antistatic Wriststrap

Multimeter Cable Tester

Cable Termination Kit

Network Analyzer Scanner

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Power On Self Test (POST) Card

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# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** 300 TROUBLESHOOTING, REPAIR AND MAINTENANCE
**Number:** 300 **Hours:** 40.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will demonstrate knowledge of troubleshooting theory and apply it to computer hardware and software problems.

**Tasks:**

PA301 - Apply industry standard troubleshooting methods.

PA302 - Troubleshoot common hardware and operating system symptoms and their causes.

PA304 - Identify common laptop issues and determine the appropriate basic troubleshooting method.

PA305 - Integrate common preventative maintenance techniques.

PA307 - Diagnose and repair common printer issues.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
CRAFT & STRUCTURE GRADES 9-10-11-12
Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
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INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
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Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
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Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12
Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and

comprehend technical texts independently and proficiently.

*Connecting Anchor/Standard:*

- Pennsylvania Core Standards for Mathematics Standard 2.0

  *Supporting Anchor/Standards:*

  NUMBERS AND OPERATIONS
  Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
  Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.
  Standard 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
  Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers

**Instructional Activities:**

Knowledge:
Complete textbook assignment(s)
Complete computer assignment(s) as needed
Complete laboratory activity and associated worksheet assignment
Complete activities assigned for TestOut-LabSim
Participate in theory lesson and respond to questions
Participate in group activities according to specific content assignment
Take notes during theory lesson and keep a notebook
Complete Study Guide according to instructions

Skill:
Complete laboratory activity and associated worksheet assignment
Complete activities assigned for TestOut-LabSim
Complete tutorial software assignments
Troubleshoot a PC computer
Troubleshoot a laptop
Troubleshoot a printer
Troubleshoot operating system issues

Remediation:
Make corrections to graded work
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Study groups
Review games
Reading comprehension packets
Placing events in a time line
Create a chart
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction
Checklists

Enrichment:
Research an approved topic
Do live work

Use TestOut for review
Conduct a safety review of the laboratory area and classroom
Live work

**Special Adaptations:**

- Extended Time (assignments and/or testing)
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- Wait Time
- Access to School Counselor
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- Use of Assistive Device (i.e. notepad, laptop, ect.)
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- Syllabus for Major Projects
- Grading Rubric
- Communication Regarding Behavior & Consequences (PBS)
- Clear Language for Directions
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Use proper safety precautions when using /operating hand tools
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times
Follow proper classroom procedures

**Assessment:**

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Quizzes
Pre/Post Tests
Essays
Focused Free Write
Summaries
Log/Journal
Time Cards
Writing Activities
Video/DVD Worksheets
Rubrics
Check Lists
Role-play Activities
Debates
Oral Presentation
Group Projects
Research Papers
Current Events
Any content related assessment
Portfolio

**Resources/Equipment:**

MSDS binder

Wireless Router

Cisco Routers

Cisco Switches

Fire extinguisher

Internet access

Whiteboard

LCD Projector

Personal Computers

Laptops

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# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** 400 OPERATING SYSTEMS AND SOFTWARE
**Number:** 400 **Hours:** 70.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to identify, configure, upgrade, troubleshoot, and maintain computer software.

**Tasks:**

PA401 - Identify different operating systems by their features.

PA402 - Use various user interfaces.

PA403 - Install and configure an operating system.

PA404 - Explain boot sequences, methods and startup utilities for various operating systems.

PA405 - Reserved

PA406 - Differentiate between various operating system directory structures.

PA407 - Use system utilities/tools and evaluate the results.

PA408 - Troubleshoot common OS and software issues.

PA409 - Manage local users, groups and institute local security policies.

PA410 - Install and configure a network and workstation operating system.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
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CRAFT & STRUCTURE GRADES 9-10-11-12
Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
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INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author’s claim for solving a technical problem.

Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.
INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12
Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

*Focus Anchor/Standard #2:*

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

*Supporting Anchor/Standards:*

TEXT TYPES AND PURPOSE GRADES 9-10-11-12
Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.
Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.
PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12
Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.
Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.
RESEARCH GRADES 9-10-11-12
Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.
Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.
Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.
RANGE OF WRITING GRADES 9-10-11-12
Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

*Connecting Anchor/Standard:*

- Pennsylvania Core Standards for Mathematics Standard 2.0

*Supporting Anchor/Standards:*

NUMBERS AND OPERATIONS
Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.
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**Instructional Activities:**

Knowledge:
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Skill:
Complete laboratory activity and associated worksheet assignment
Complete activities assigned for TestOut-LabSim
Complete tutorial software assignments
Install and configure an operating system
Configure a user interface
Troubleshoot and resolve operating system problems
Create users and groups
Create and implement a local security policy

Remediation:
Make corrections to graded work
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
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Peer tutoring
Study groups
Review games
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Enrichment:
Research an approved topic
Do live work
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Conduct a safety review of the laboratory area and classroom
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**Special Adaptations:**

- Extended Time (assignments and/or testing)
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Internet access

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LCD Projector

Personal Computers

Laptops

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Power On Self Test (POST) Card

Laser Printer

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CompTIA TestOut Software

Microsoft Office

Meyers. M. (2016). CompTIA A+ Guide to Managing and Troubleshooting PCs (5th ed.). Columbus, OH: McGraw Hill Companies

Meyers. M. (2015). CompTIA Network+ Guide to Managing and Troubleshooting Networks (4th ed.). Columbus, OH:Hyperlinks:

www.schoology.com

www.netacad.com

www.testout.com

www.professormesser.com

platform.CompTIA.org

www.Cyber.org

# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** 500 NETWORK TECHNOLOGIES
**Number:** 500 **Hours:** 84.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to explain network protocols, ports, addressing formats, routing protocols, the properties of routing, and wireless standards.

**Tasks:**

PA501 - Explain the function of common networking protocols, such as FTP, TCP/IP suite, DHCP, DNS.

PA502 - Identify commonly used TCP and UDP default ports, including TCP ports: FTP – 20, 21, SSH – 22, TELNET – 23, HTTP – 80.

PA503 - Identify address formats, including IPv6, IPv4, MAC.

PA504 - Evaluate the proper use of addressing technologies and addressing schemes, including: subnetting: classful vs. classless, NAT, PAT, SNAT, public vs. private, DHCP, addressing schemes: unicast, multicast, broadcast.

PA505 - Identify common IPv4 and IPv6 routing protocols, including link state, distance vector, and hybrid protocols.

PA506 - Explain the purpose and properties of routing, including IGP vs. EGP, static vs. dynamic, next hop, interpret routing tables and how they pertain to path selection, convergence (steady state).

PA507 - Identify the characteristics of wireless communication, including 802.11 and 802.15 standards: speeds, distance, channels, frequency, authentication and encryption.

PA508 - Identify the basic elements of unified communication technology such as: VoIP, video, real time services, POS and UC devices.

PA509 - Implement technologies that support cloud computing.

PA510 - Implement virtualiztion technologies.

**Standards / Assessment Anchors**

*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

  *Supporting Anchor/Standards:*

  KEY IDEAS/DETAILS GRADES 9-10-11-12
  Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
  Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
  Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
  CRAFT & STRUCTURE GRADES 9-10-11-12
  Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
  Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.
  Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author’s purpose in providing an

explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.
INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author's claim for solving a technical problem.
Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.
INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12
Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

*Focus Anchor/Standard #2:*

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

  *Supporting Anchor/Standards:*

  TEXT TYPES AND PURPOSE GRADES 9-10-11-12
  Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.
  Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.
  PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12
  Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.
  Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
  Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.
  RESEARCH GRADES 9-10-11-12
  Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.
  Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.
  Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.
  RANGE OF WRITING GRADES 9-10-11-12
  Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

*Connecting Anchor/Standard:*

- Pennsylvania Core Standards for Mathematics Standard 2.0

  *Supporting Anchor/Standards:*

  NUMBERS AND OPERATIONS
  Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
  Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.
  Standard 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
  Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers

**Instructional Activities:**

Knowledge:
Complete textbook assignment(s)
Complete computer assignment(s) as needed
Complete laboratory activity and associated worksheet assignment
Complete activities assigned for TestOut-LabSim
Participate in theory lesson and respond to questions
Participate in group activities according to specific content assignment
Take notes during theory lesson and keep a notebook
Complete Study Guide according to instructions

Skill:
Complete laboratory activity and associated worksheet assignment
Complete activities assigned for TestOut-LabSim
Complete tutorial software assignments
Write numbers and convert numbers between the binary, decimal, and hexadecimal number systems
Identify and configure the network information for a computer
Classify IP addresses and their subnet mask
Write IP addresses in CIDR notation
Subnet a network
Describe common networking protocols and their associated ports

Remediation:
Make corrections to graded work
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Study groups
Review games
Reading comprehension packets
Placing events in a time line
Create a chart
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction
Checklists

Enrichment:
Research an approved topic
Do live work
Use TestOut for review
Conduct a safety review of the laboratory area and classroom
Live work

**Special Adaptations:**

- Extended Time (assignments and/or testing)
- Graphic Organizer
- Chunking of Assignments/Material
- Preferential Seating
- Directions/Comprehension Check (frequent checks for understanding)
- Study Guide
- Directions and/or Tests Read Aloud

- Adapted Tests and/or Assignments
- Use of Calculator
- Taking Tests in Alternate Setting (or if requested)
- Verbal/Gestural Redirection (prompts to remain on task)
- Drill and Practice (Repetition of Material)
- No Penalization for Spelling
- Copy of Teacher/Student Notes/Skeleton Notes
- Small Group Instruction
- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)
- Use of Daily Planner/Assignment Book (monitor use of)
- Teacher Modeling
- Use of Computer (Access to)
- Wait Time
- Access to School Counselor
- Use of Highlighter/Highlighted Text
- Provide Frequent Feedback
- Variety of Assessment Methods
- Use of Assistive Device (i.e. notepad, laptop, ect.)
- Highly Structured Classroom
- Syllabus for Major Projects
- Grading Rubric
- Communication Regarding Behavior & Consequences (PBS)
- Clear Language for Directions
- Use of Multisensory Approach
- Provide Opportunities to Retest
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- Testing - Allow Dictation of Lengthy Answers
- Monitor Speed/Accuracy in which Student Completes Assignment
- Access to Closed Captioning as Available (upon request)
- Encouragement to Participate in Positive Leadership Roles
- Student Self-Evaluation for Behavior
- Exempt from reading Aloud in Front of Peers

**Safety:**

Student must:
Use computer equipment in an ergonomic fashion
Handle material in a safe and work like manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times
Follow proper classroom procedures

**Assessment:**

TestOut Test
Worksheets
Quizzes
Pre/Post Tests
Essays
Focused Free Write
Summaries
Log/Journal
Time Cards
Writing Activities
Video/DVD Worksheets
Rubrics
Check Lists
Role-play Activities
Debates
Oral Presentation
Group Projects
Research Papers
Current Events
Any content related assessment
Portfolio

**Resources/Equipment:**

MSDS binder

Wireless Router

Cisco Routers

Cisco Switches

Fire extinguisher

Internet access

Whiteboard

LCD Projector

Personal Computers

Laptops

Cisco Routers

Cisco Firewall

Switch Hub

PC Toolkit

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# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** 600 NETWORK MEDIA AND TOPOLOGIES
**Number:** 600 **Hours:** 55.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to identify network cables, connectors, and topologies. Student will be able to categorize LAN and WAN technology types. Student will be able to install components of wiring distribution using appropriate wiring standards.

**Tasks:**

PA601 - Categorize standard cable types and their properties e.g., UTP, STP, coaxial, fiber; plenum vs. non-plenum properties: transmission speeds, distance, duplex, noise immunity, frequency.

PA602 - Identify common connector types, including UTP, STP, coaxial, and fiber.

PA603 - Identify common physical network topologies.

PA604 - Differentiate and fabricate cables according to TIA/EIA 568A and 568B standards, including patch, crossover, and rollover cables.

PA605 - Categorize common WAN technology types and properties.

PA606 - Categorize common LAN technology types and ethernet properties, e.g., CSMA/CD, broadcast, collision, bonding, speed, distance.

PA607 - Explain common logical network topologies and their characteristics, including peer to peer and client/server.

PA608 - Install components of wiring distribution, including vertical and horizontal cross connects, verify installation and termination and environmental requirements.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
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*Supporting Anchor/Standards:*

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Use proper safety precautions when using /operating hand tools
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Know and follow the established safety rules at all times
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**Assessment:**

TestOut Test
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Essays
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Writing Activities

Video/DVD Worksheets
Rubrics
Check Lists
Role-play Activities
Debates
Oral Presentation
Group Projects
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Current Events
Any content related assessment
Portfolio

**Resources/Equipment:**

MSDS binder

Wireless Router

Cisco Routers

Cisco Switches

Fire extinguisher

Internet access

Whiteboard

LCD Projector

Personal Computers

Laptops

Cisco Routers

Cisco Firewall

Switch Hub

PC Toolkit

Antistatic Wriststrap

Multimeter Cable Tester

Cable Termination Kit

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# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** 700 NETWORK DEVICES
**Number:** 700 **Hours:** 51.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to install, configure, and secure, common network connectivity devices.

**Tasks:**

PA701 - Install, configure and differentiate between common network connectivity devices.

PA702 - Identify the functions of specialized network devices such as, multilayer switch, content switch, IDS/IPS, load balancer, multifunction network devices, DNS server, bandwidth shaper, proxy server, CSU/DSU.

PA703 - Explain the advanced features of a switch, such as PoE, spanning tree, VLAN, trunking, port mirroring, port authentication.

PA704 - Install a basic wireless network, including client configuration, access point placement and Installation.

PA705 - Configure appropriate encryption, configure channels and frequencies, set ESSID and beacon, verify installation.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

*Supporting Anchor/Standards:*

3.4.10.C1 Apply the components of the technological design process.
3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.10.A1 Illustrate how the development of technologies is often driven by profit and an economic market.
3.4.10.A3 Examine how technology transfer occurs when a new user applies an existing innovation developed for one purpose in a different function.
3.4.10.B1 Compare and contrast how the use of technology involves weighing the trade-offs between the positive and negative effects.
3.4.10.B2 Demonstrate how humans devise technologies to reduce the negative consequences of other technologies.
3.4.10.B3 Compare and contrast how a number of different factors, such as advertising, the strength of the economy, the goals of a company and the latest fads, contribute to shaping the design of and demand for various technologies.
3.4.10.B4 Recognize that technological development has been evolutionary, the result of a series of refinements to a basic invention.
3.2.12.B5 Research how principles of wave transmissions are used in a wide range of technologies. Research technologies that incorporate principles of wave transmission.

3.4.12.E4 Synthesize the effects of information and communication systems and subsystems as an integral part of the development of the Information Age.

*Focus Anchor/Standard #2:*

- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

  *Supporting Anchor/Standards:*

  CC.3.5.9-10.A. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.
  CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
  CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
  CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
  CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.

*Connecting Anchor/Standard:*

- CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.

  *Supporting Anchor/Standards:*

  CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
  CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.
  CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
  CC.2.3.8.A.1 Apply the concepts of volume of cylinders, cones, and spheres to solve real-world and mathematical problems.
  CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

**Instructional Activities:**

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Take notes during theory lesson and keep a notebook
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Skill:
Complete laboratory activity and associated worksheet assignment
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Complete tutorial software assignments
Install and configure a hub, switch, and router
Install, configure, and secure a wireless network

Remediation:
Make corrections to graded work
Re-teach major concepts
Review with teacher assistance
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Worksheets
Individual tutoring
Group tutoring
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Study groups
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- Access to School Counselor
- Use of Highlighter/Highlighted Text
- Provide Frequent Feedback
- Variety of Assessment Methods
- Use of Assistive Device (i.e. notepad, laptop, ect.)
- Highly Structured Classroom
- Syllabus for Major Projects
- Grading Rubric
- Communication Regarding Behavior & Consequences (PBS)
- Clear Language for Directions
- Use of Multisensory Approach
- Provide Opportunities to Retest
- Frequent Review Sessions
- Use a variety of Modalities when Introducing Skills/Concepts
- Books on Tape or CD
- Allow Oral Answers for Testing
- Provide Editing Assistance
- Copies of Text for Home
- De-Escalation Opportunities
- Cue for Oral Response
- Text to Speech (other than for NOCTI)

- Daily Classwork Check
- Encourage Student to Check Work Before Turning In
- Opportunities for Repeated Practice of MATH Skills
- Provide repetition During Initial Instruction
- Provide Verbal and Written Directions
- All Vocabulary to be Defined Before Testing
- Testing - Allow Dictation of Lengthy Answers
- Monitor Speed/Accuracy in which Student Completes Assignment
- Access to Closed Captioning as Available (upon request)
- Encouragement to Participate in Positive Leadership Roles
- Student Self-Evaluation for Behavior
- Exempt from reading Aloud in Front of Peers

**Safety:**

Student must:
Use computer equipment in an ergonomic fashion
Handle material in a safe and work like manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times
Follow proper classroom procedures

**Assessment:**

TestOut Test
Worksheets
Quizzes
Pre/Post Tests
Essays
Focused Free Write
Summaries
Log/Journal
Time Cards
Writing Activities
Video/DVD Worksheets
Rubrics
Check Lists
Role-play Activities
Debates
Oral Presentation
Group Projects
Research Papers
Current Events
Any content related assessment
Portfolio

**Resources/Equipment:**

MSDS binder

Wireless Router

Cisco Routers

Cisco Switches

Fire extinguisher

Internet access

Whiteboard

LCD Projector

Personal Computers

Laptops

Cisco Routers

Cisco Firewall

Switch Hub

PC Toolkit

Antistatic Wriststrap

Multimeter Cable Tester

Cable Termination Kit

Network Analyzer Scanner

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Microsoft Disk Operating System (DOS)

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# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** 800 NETWORK MANAGEMENT
**Number:** 800 **Hours:** 40.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to contrast the different layers of the OSI and TCP/IP models and to perform tasks related to network management.

**Tasks:**

PA801 - Explain, compare and contrast the layers of the TCP/IP and OSI models.

PA802 - Prepare physical and logical network diagrams, baselines, policies, procedures, and configurations and regulations.

PA803 - Evaluate the network based on configuration management documentation; such as: wiring schematics; physical and logical network diagrams; baselines; policies, procedures, and configurations to network devices and infrastructure; wiring schematics; physical and logical network diagrams; and configurations and job logs.

PA804 - Conduct network monitoring to identify performance and connectivity issues such as, packet sniffers, connectivity software, load testing, throughput testers, system logs, history logs, event logs.

PA806 - Implement remote management technologies.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
CRAFT & STRUCTURE GRADES 9-10-11-12
Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.
Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author’s purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.
INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author’s claim for solving a technical problem.
Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.
INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical

text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12
Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

*Focus Anchor/Standard #2:*

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

*Supporting Anchor/Standards:*

TEXT TYPES AND PURPOSE GRADES 9-10-11-12
Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.
Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.
PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12
Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.
Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.
RESEARCH GRADES 9-10-11-12
Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.
Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.
Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.
RANGE OF WRITING GRADES 9-10-11-12
Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

*Connecting Anchor/Standard:*

- Pennsylvania Core Standards for Mathematics Standard 2.0

*Supporting Anchor/Standards:*

NUMBERS AND OPERATIONS
Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.
Standard 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers

**Instructional Activities:**

Knowledge:
Complete textbook assignment(s)
Complete computer assignment(s) as needed
Complete laboratory activity and associated worksheet assignment
Complete activities assigned for TestOut-LabSim
Participate in theory lesson and respond to questions
Participate in group activities according to specific content assignment
Take notes during theory lesson and keep a notebook
Complete Study Guide according to instructions

Skill:

Complete laboratory activity and associated worksheet assignment
Complete activities assigned for TestOut-LabSim
Complete tutorial software assignments
Create network baselines to monitor performance
Evaluate, monitor, and optimize network performance
Create a network disaster recovery plan
Create, update, and evaluate network documentation

Remediation:
Make corrections to graded work
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Study groups
Review games
Reading comprehension packets
Placing events in a time line
Create a chart
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction
Checklists

Enrichment:
Research an approved topic
Do live work
Use TestOut for review
Conduct a safety review of the laboratory area and classroom
Live work

**Special Adaptations:**

- Extended Time (assignments and/or testing)
- Graphic Organizer
- Chunking of Assignments/Material
- Preferential Seating
- Directions/Comprehension Check (frequent checks for understanding)
- Study Guide
- Directions and/or Tests Read Aloud
- Adapted Tests and/or Assignments
- Use of Calculator
- Taking Tests in Alternate Setting (or if requested)
- Verbal/Gestural Redirection (prompts to remain on task)
- Drill and Practice (Repetition of Material)
- No Penalization for Spelling
- Copy of Teacher/Student Notes/Skeleton Notes
- Small Group Instruction
- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)
- Use of Daily Planner/Assignment Book (monitor use of)
- Teacher Modeling
- Use of Computer (Access to)
- Wait Time
- Access to School Counselor
- Use of Highlighter/Highlighted Text
- Provide Frequent Feedback
- Variety of Assessment Methods

- Use of Assistive Device (i.e. notepad, laptop, ect.)
- Highly Structured Classroom
- Syllabus for Major Projects
- Grading Rubric
- Communication Regarding Behavior & Consequences (PBS)
- Clear Language for Directions
- Use of Multisensory Approach
- Provide Opportunities to Retest
- Frequent Review Sessions
- Use a variety of Modalities when Introducing Skills/Concepts
- Books on Tape or CD
- Allow Oral Answers for Testing
- Provide Editing Assistance
- Copies of Text for Home
- De-Escalation Opportunities
- Cue for Oral Response
- Text to Speech (other than for NOCTI)
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- Exempt from reading Aloud in Front of Peers

**Safety:**

Student must:
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Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times
Follow proper classroom procedures

**Assessment:**

TestOut Test
Worksheets
Quizzes
Pre/Post Tests
Essays
Focused Free Write
Summaries
Log/Journal
Time Cards
Writing Activities
Video/DVD Worksheets
Rubrics
Check Lists
Role-play Activities
Debates

Oral Presentation
Group Projects
Research Papers
Current Events
Any content related assessment
Portfolio

**Resources/Equipment:**

MSDS binder

Wireless Router

Cisco Routers

Cisco Switches

Fire extinguisher

Internet access

Whiteboard

LCD Projector

Personal Computers

Laptops

Cisco Routers

Cisco Firewall

Switch Hub

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# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** 900 NETWORK TOOLS AND TROUBLESHOOTING
**Number:** 900 **Hours:** 50.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able appropriately use command line / graphical tools and networking tools. Student will know and be able to apply the network troubleshooting methodology to solve networking issues.

**Tasks:**

PA901 - Utilize command line/graphical tools and interpret the output to verify functionality including, Traceroute, Ipconfig, Ifconfig, and Ping.

PA902 - Use network scanners such as, packet sniffers, intrusion detection software, Intrusion prevention software, and port scanners.

PA903 - Utilize the appropriate hardware tools for cable fabrication and troubleshooting.

PA904 - Implement network troubleshooting methodologies, including Information gathering – identify symptoms and problems, Identify the affected areas of the network.

PA905 - Develop an action plan and solution identifying potential effects, implement and test the solution, identify the results and effects of the solution, document the solution and the entire process.

PA906 - Troubleshoot common wired and wireless connectivity issues and select an appropriate solution to include physical and logical issues.

PA907 - Troubleshoot and resolve common WAN issues such as: loss of connectivity, DNS, router configurations, and default gateways.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
CRAFT & STRUCTURE GRADES 9-10-11-12
Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.
Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author’s purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.
INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).
Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author’s claim for solving a

technical problem.
Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.
INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12
Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

*Focus Anchor/Standard #2:*

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

  *Supporting Anchor/Standards:*

  TEXT TYPES AND PURPOSE GRADES 9-10-11-12
  Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.
  Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.
  PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12
  Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.
  Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
  Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.
  RESEARCH GRADES 9-10-11-12
  Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.
  Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.
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  RANGE OF WRITING GRADES 9-10-11-12
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*Connecting Anchor/Standard:*

- Pennsylvania Core Standards for Mathematics Standard 2.0

  *Supporting Anchor/Standards:*

  NUMBERS AND OPERATIONS
  Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
  Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.
  Standard 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
  Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers

**Instructional Activities:**

Knowledge:
Complete textbook assignment(s)
Complete computer assignment(s) as needed

Complete laboratory activity and associated worksheet assignment
Complete activities assigned for TestOut-LabSim
Participate in theory lesson and respond to questions
Participate in group activities according to specific content assignment
Take notes during theory lesson and keep a notebook
Complete Study Guide according to instructions

Skill:
Complete laboratory activity and associated worksheet assignment
Complete activities assigned for TestOut-LabSim
Complete tutorial software assignments
Troubleshoot a network using the appropriate CLI or GUI software tool
Troubleshoot a network using the appropriate hardware tool
Troubleshoot wired network connectivity issues
Troubleshoot wireless network connectivity issues
Demonstrate proper use of the network troubleshooting methodology

Remediation:
Make corrections to graded work
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Study groups
Review games
Reading comprehension packets
Placing events in a time line
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Retest or alternative assessment
Technology integration
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Computer assisted instruction
Checklists

Enrichment:
Research an approved topic
Do live work
Use TestOut for review
Conduct a safety review of the laboratory area and classroom
Live work

**Special Adaptations:**

- Extended Time (assignments and/or testing)
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Know and follow the established safety rules at all times
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**Assessment:**

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Worksheets
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Check Lists
Role-play Activities
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Group Projects
Research Papers
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Any content related assessment
Portfolio

**Resources/Equipment:**

MSDS binder

Wireless Router

Cisco Routers

Cisco Switches

Fire extinguisher

Internet access

Whiteboard

LCD Projector

Personal Computers

Laptops

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# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** 1000 SECURITY FUNDAMENTALS
**Number:** 1000 **Hours:** 60.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to understand security fundamentals related to network security devices, security features, access methods, and user authentication. Student will know and be able to identify security threats and demonstrate basic mitigation techniques.

**Tasks:**

PA1001 - Configure hardware and software security devices such as, network-based firewall, host-based firewall, DMZ, IDS, IPS, VPN concentrator.

PA1002 - Implement features of a network firewall, such as application layer vs. network layer, stateful vs. stateless, scanning services, content filtering, signature identification, zones.

PA1003 - Configure network access security such as, ACL: MAC filtering, IP filtering tunneling and encryption: SSL VPN, VPN, L2TP, PPTP and related others.

PA1004 - Differentiate the principals of user authentication such as, PKI, Kerberos, AAA: RADIUS, TACACS+, network access control: 802.1x, CHAP, MS-CHAP, EAP.

PA1005 - Evaluate issues that affect device security such as, physical security and network access.

PA1006 - Identify and mitigate common security threats.

PA1007 - Demonstrate security features including BIOS security, password management, locking workstations, and biometrics.

PA1008 - Demonstrate basic forensic concepts such as: incident response, chain of custody, evidence preservation, and documentation.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

*Supporting Anchor/Standards:*

KEY IDEAS/DETAILS GRADES 9-10-11-12
Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.
Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.
Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.
CRAFT & STRUCTURE GRADES 9-10-11-12
Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.
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Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author’s purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.
INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10
Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).

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Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.
INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12
Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.
Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.
Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.
RANGE OF READING GRADES 9-10-11-12
Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

*Focus Anchor/Standard #2:*

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

*Supporting Anchor/Standards:*

TEXT TYPES AND PURPOSE GRADES 9-10-11-12
Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.
Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.
PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12
Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.
Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.
RESEARCH GRADES 9-10-11-12
Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.
Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.
Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.
RANGE OF WRITING GRADES 9-10-11-12
Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

*Connecting Anchor/Standard:*

- Pennsylvania Core Standards for Mathematics Standard 2.0

*Supporting Anchor/Standards:*

NUMBERS AND OPERATIONS
Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.
Standard 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers

**Instructional Activities:**

Knowledge:
Complete textbook assignment(s)
Complete computer assignment(s) as needed

Complete laboratory activity and associated worksheet assignment
Complete activities assigned for TestOut-LabSim
Participate in theory lesson and respond to questions
Participate in group activities according to specific content assignment
Take notes during theory lesson and keep a notebook
Complete Study Guide according to instructions

Skill:
Complete laboratory activity and associated worksheet assignment
Complete activities assigned for TestOut-LabSim
Complete tutorial software assignments
Secure a personal computer
Secure a computer network
Identify and mitigate common security threats

Remediation:
Make corrections to graded work
Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Study groups
Review games
Reading comprehension packets
Placing events in a time line
Create a chart
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction
Checklists

Enrichment:
Research an approved topic
Do live work
Use TestOut for review
Conduct a safety review of the laboratory area and classroom
Live work

**Special Adaptations:**

- Extended Time (assignments and/or testing)
- Graphic Organizer
- Chunking of Assignments/Material
- Preferential Seating
- Directions/Comprehension Check (frequent checks for understanding)
- Study Guide
- Directions and/or Tests Read Aloud
- Adapted Tests and/or Assignments
- Use of Calculator
- Taking Tests in Alternate Setting (or if requested)
- Verbal/Gestural Redirection (prompts to remain on task)
- Drill and Practice (Repetition of Material)
- No Penalization for Spelling
- Copy of Teacher/Student Notes/Skeleton Notes
- Small Group Instruction
- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)
- Use of Daily Planner/Assignment Book (monitor use of)

- Teacher Modeling
- Use of Computer (Access to)
- Wait Time
- Access to School Counselor
- Use of Highlighter/Highlighted Text
- Provide Frequent Feedback
- Variety of Assessment Methods
- Use of Assistive Device (i.e. notepad, laptop, ect.)
- Highly Structured Classroom
- Syllabus for Major Projects
- Grading Rubric
- Communication Regarding Behavior & Consequences (PBS)
- Clear Language for Directions
- Use of Multisensory Approach
- Provide Opportunities to Retest
- Frequent Review Sessions
- Use a variety of Modalities when Introducing Skills/Concepts
- Books on Tape or CD
- Allow Oral Answers for Testing
- Provide Editing Assistance
- Copies of Text for Home
- De-Escalation Opportunities
- Cue for Oral Response
- Text to Speech (other than for NOCTI)
- Daily Classwork Check
- Encourage Student to Check Work Before Turning In
- Opportunities for Repeated Practice of MATH Skills
- Provide repetition During Initial Instruction
- Provide Verbal and Written Directions
- All Vocabulary to be Defined Before Testing
- Testing - Allow Dictation of Lengthy Answers
- Monitor Speed/Accuracy in which Student Completes Assignment
- Access to Closed Captioning as Available (upon request)
- Encouragement to Participate in Positive Leadership Roles
- Student Self-Evaluation for Behavior
- Exempt from reading Aloud in Front of Peers

**Safety:**

Student must:
Use computer equipment in an ergonomic fashion
Handle material in a safe and work like manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times
Follow proper classroom procedures

**Assessment:**

TestOut Test
Worksheets
Quizzes
Pre/Post Tests
Essays
Focused Free Write
Summaries
Log/Journal

Time Cards
Writing Activities
Video/DVD Worksheets
Rubrics
Check Lists
Role-play Activities
Debates
Oral Presentation
Group Projects
Research Papers
Current Events
Any content related assessment
Portfolio

**Resources/Equipment:**

MSDS binder

Wireless Router

Cisco Routers

Cisco Switches

Fire extinguisher

Internet access

Whiteboard

LCD Projector

Personal Computers

Laptops

Cisco Routers

Cisco Firewall

Switch Hub

PC Toolkit

Antistatic Wriststrap

Multimeter Cable Tester

Cable Termination Kit

Network Analyzer Scanner

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Dot Matrix Printer

Inkjet Printer

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Webcam

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Microsoft Disk Operating System (DOS)

Microsoft Windows 7, 10, and 11 Operating Systems

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Microsoft Office

Meyers. M. (2016). CompTIA A+ Guide to Managing and Troubleshooting PCs (5th ed.). Columbus, OH: McGraw Hill Companies

Meyers. M. (2015). CompTIA Network+ Guide to Managing and Troubleshooting Networks (4th ed.). Columbus, OH:Hyperlinks:

www.schoology.com

www.netacad.com

www.testout.com

www.professormesser.com

platform.CompTIA.org

www.Cyber.org

# Monroe Career & Technical Institute

## Course: Computer Networking and Security

**Unit Name:** 1100 Communication and Professionalism
**Number:** 1100 **Hours:** 10.00
**Dates:** Spring 2025

**Description/Objectives:**

Student will know and be able to effectively communicate with customers and follow proper workplace policies.

**Tasks:**

PA1101 - Use effective communication with customers, such as proper etiquette, active listening, and cultural sensitivity.

PA1102 - Solve customer problems.

PA1103 - Implement and adhere to acceptable use policies.

PA1104 - Maintain customer confidentiality.

PA1105 - Maintain asset inventory.

**Standards / Assessment Anchors**
*Focus Anchor/Standard #1:*

- Career Education and Work Standards
  13.3. Career Retention and Advancement

  *Supporting Anchor/Standards:*
  13.3.11 B. Evaluate team member roles to describe and illustrate active listening techniques: Clarifying Encouraging Reflecting Restating Summarizing C. Evaluate conflict resolution skills as they relate to the workplace: Constructive criticism Group dynamics Managing/leadership Mediation Negotiation Problem solving
  13.3.11 C. Evaluate conflict resolution skills as they relate to the workplace: Constructive criticism Group dynamics Managing/leadership Mediation Negotiation Problem solving

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