

# Network Technologies

Career Cluster	Information Technology
Course Code	10101
Prerequisite(s)	Introduction To Information Technology Careers (Recommended), Computer Applications (Recommended), Computer Hardware & Software (Recommended)
Credit	.5-1
Program of Study and Sequence	This course or a dual enrollment equivalent is required for the Networking & Hardware pathway and recommended for the Programming pathway
Student Organization	SkillsUSA
Coordinating Work-Based Learning	Guest Speakers, Tours, Job Shadowing, Personal Portfolio
Industry Certifications	None
Dual Credit or Dual Enrollment	TBD
Teacher Certification	Information Technology Cluster Endorsement; Networking Systems & Information Support Pathway Endorsement; K-12 Educational Technology Endorsement; K-12 Classroom Technology Endorsement
Resources	

## Course Description:

Students in the Network Technologies course prepare for careers that involve network analysis, planning, and implementation, including design, installation, maintenance, and management of network systems. The successful establishment and maintenance of networking infrastructure is critical to the success of organizations.

## Program of Study Application

Part of the Networking & Hardware pathway. Recommended courses include: Introduction To Information Technology Careers, Computer Applications, and Computer Hardware & Software.

## Notes:

All Networking & Hardware standards integrate aspects of language arts and mathematics.

**Course Standards****Indicator # NT 1. Demonstrate knowledge of designing and implementing a networking system.**

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
1	NT 1.1 - Demonstrate knowledge of basic network communications Examples: <ul style="list-style-type: none"> <li>• Explore the Open Systems Interconnection (OSI) networking model</li> <li>• Compare different networking communication protocols: transmission control protocol (TCP), Internet protocol (IP), user datagram protocol (UDP)</li> <li>• Describe the channel reservation process used on wireless carrier sense multiple access/collision avoidance (CSMA/CA) protocol</li> <li>• Discuss the carrier sense multiple access/collision detect (CSMA/CD) process on a wired network</li> </ul>	
1	NT 1.2 - Demonstrate knowledge of basic network classifications and topologies Examples: <ul style="list-style-type: none"> <li>• Identify elements found in physical and logical network topologies</li> <li>• Define elements of physical and logical wired and wireless technologies</li> <li>• Evaluate and define a variety of network architectures</li> </ul>	
1	NT 1.3 Demonstrate knowledge of common network hardware Examples: <ul style="list-style-type: none"> <li>• Identify a variety of networking components as media, hosts, peripherals, routers, switches, and other networking devices</li> <li>• Explore network device options and features to specific needs</li> </ul>	

4	<p>NT 1.4 Apply knowledge of local area network (LAN) physical media</p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Identify and explore cabling standards, including coaxial cable, unshielded twisted pair (UTP), shielded twisted pair (STP), Fiber Optics, and wireless</li> <li>• Construct and test UTP cables</li> <li>• Connect appropriate media to internetworking devices</li> </ul>	
1	<p>NT 1.5 Demonstrate knowledge of communication standards for networks</p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Distinguish between the capabilities of the currently available Institute of Electrical and Electronics Engineers (IEEE) standards (802.11, 802.3, 802.5, 802.15)</li> <li>• Suggest appropriate wide area network (WAN) connections based on a match between connection standard and user requirements. (Fiber, digital subscriber line (DSL), transmission system 1 (T1))</li> </ul>	
4	<p>NT 1.6 Plan, design, and create network architecture</p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Identify current and future needs of a network</li> <li>• Discuss subnetting and binary systems</li> <li>• Use design software to create a simulated network</li> <li>• Build a physical network as outlined in design</li> </ul>	
2	<p>NT 1.7 Demonstrate knowledge of Network Operating Systems (NOS)</p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Contrast the features of an Operating System and a NOS</li> <li>• Discuss services offered by a network operating system (Active Directory, Web Server, dynamic host configuration protocol (DHCP), domain name system (DNS))</li> </ul>	

**Notes:**

**Indicator # NT 2. Perform network operating system installation and configuration.**

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
2	NT 2.1 Install a network operating system Examples: <ul style="list-style-type: none"> <li>• Identify enterprise network documentation that help determine system requirements</li> <li>• Install Windows Server operating system</li> <li>• Install UNIX/Linux server operating system</li> </ul>	
2	NT 2.2 Configure a network operating system Examples: <ul style="list-style-type: none"> <li>• Setup proper IP addressing and subnets</li> <li>• Setup a directory service (Active Directory)</li> <li>• Create network users</li> <li>• Identify policies and procedures for routine administration (user agreements, incident reporting, recovery for users, software updates)</li> </ul>	
4	NT 2.3 Troubleshoot and resolve network problems Examples: <ul style="list-style-type: none"> <li>• Resolve IP addressing conflicts</li> <li>• Use appropriate network utilities to troubleshoot various connectivity issues</li> <li>• Troubleshoot using simulation software</li> </ul>	

**Notes:**

**Indicator # NT 3. Apply knowledge of network security systems.**

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
3	NT 3.1 Apply proper procedures for securing a network Examples: <ul style="list-style-type: none"> <li>• Discuss various network security solutions</li> <li>• Configure wireless security settings for integrated router</li> <li>• Configure firewall settings on a graphical user interface (GUI) interface to create a demilitarized zone (DMZ)</li> <li>• Use permissions to secure data on a host (local file and network permissions)</li> </ul>	
2	NT 3.2 Demonstrate penetration testing and ethical hacking Examples: <ul style="list-style-type: none"> <li>• Discuss penetration testing techniques</li> <li>• Utilize software for ethical hacking to identify vulnerabilities</li> </ul>	

**Notes:**

**Indicator # NT 4. Demonstrate knowledge of common help desk tools, resources and techniques.**

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
2	NT 4.1 Use proper documentation and incident reporting Examples: <ul style="list-style-type: none"> <li>• Install and utilize an information technology (IT) support ticket system</li> <li>• Manage priorities effectively</li> </ul>	
3	NT 4.2 Incorporate customer service skills Examples: <ul style="list-style-type: none"> <li>• Use remote software to guide end users to solve a problem</li> <li>• Communicate effectively with end users</li> </ul>	

**Notes:**

**Indicator # NT 5. Explore Careers in Network Technology**

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
1	NT 5.1 Identify skills, interests, and abilities related to network technology Example: <ul style="list-style-type: none"> <li>• Job shadowing, guest speakers, and online resources</li> </ul>	Job Shadowing, Guest Speakers, Tours
2	NT 5.2 Compare personal interest survey results with network technology occupations Example: <ul style="list-style-type: none"> <li>• Use South Dakota MyLife to research and compare careers</li> </ul>	Personal Portfolios
3	NT 5.3 Research labor market information for network technology Example: <ul style="list-style-type: none"> <li>• Write a short essay citing demographics, wages and geographical locations</li> </ul>	
2	NT 5.4 Demonstrate necessary job skills needed for information technology industries Examples: <ul style="list-style-type: none"> <li>• Attendance and punctuality</li> <li>• Positive attitude</li> <li>• Positive work ethic</li> <li>• Use of proper social skills</li> <li>• Display ability to work as part of team and take direction from others</li> </ul>	

**Notes:**

**Indicator # NT 6. Maintain a safe and environmentally conscious environment.**

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>			
2	NT 6.1 Determine safe working practices to avoid or eliminate physical and electrical hazards Examples: <ul style="list-style-type: none"> <li>• Use proper safety equipment</li> <li>• Follow proper safety procedures</li> <li>• Identify techniques to manage power consumption</li> <li>• Describe and resolve the most common electrostatic discharge hazards</li> </ul>				
1	NT 6.2 Research environmental considerations when disposing of material Examples: <ul style="list-style-type: none"> <li>• Identify the proper disposal methods for toner cartridges, batteries, and hardware</li> <li>• List local, state, &amp; federal environmental regulations</li> </ul>				

**Notes:**