NH Computer and Information Sciences, General. 

CIP#: 11.0101

# Networks and the Internet

* Apply networking concepts, using various models to implement protocols and standards when moving data. Design systems with working switching and routing "packets" to ensure data flows to the correct destination. Ensure data traffic flows through the internet effectively.

| **Skill/Knowledge** | **Applying**  **(4) Reasoning** | **Proficient**  **(3)** | **Developing**  **(2 - 1) Reasoning** | |
| --- | --- | --- | --- | --- |
| **OSI & TCP/IP Model**  I can demonstrate a thorough understanding of the OSI and TCP/IP models, including their layers and functionalities, and effectively apply this knowledge in networking contexts. |  | * I can explain the purpose and function of each layer in the OSI and TCP/IP models. * I can identify common protocols associated with each layer (e.g., HTTP, SSH). * I can differentiate between packets and frames and describe their role in data transmission. * I can discuss encryption and compression techniques used at different layers of the OSI and TCP/IP models. |  | |
| **Configuration of Routers and Switches**  I can configure routers and switches effectively to establish and maintain network connectivity according to specified requirements. |  | * I can explain the principles of internet routing and the role of routers in directing network traffic. * I can demonstrate proficiency in configuring router interfaces, routing protocols, and access control lists (ACLs). * I can configure VLANs, trunking, and spanning tree protocol (STP) on switches to optimize network performance. |  | |
| **Troubleshooting**  I can systematically identify and resolve network issues to ensure uninterrupted operation and optimal performance. |  | * I can diagnose network connectivity problems using tools like ping, traceroute, and packet sniffers. * I can analyze network traffic patterns and performance metrics to identify bottlenecks and congestion points. * I can troubleshoot common network issues related to DNS resolution, DHCP configuration, and IP addressing conflicts. * I can document troubleshooting steps and resolutions for future reference and knowledge sharing. |  | |