# Competency Task List – Secondary Component

# Computer System Networking and Telecommunications CIP 11.0901

# High School Graduation Years 2022, 2023, 2024

## 100 Personal and Environmental Safety

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| Item | Task  | (X) Indicates Proficiency 1 | Secondary Course Crosswalk |
| 101 | List common causes of accidents and injuries in a computer facility. |   |   |
| 102 | Wear personal protective equipment. |  |  |
| 103 | List and identify safety hazard symbols. |  |  |
| 104 | Review Safety Data Sheets (SDS) and explain their requirements in handling hazardous materials. |  |  |
| 105 | Describe types of fire extinguishers and explain which types to use for extinguishing various fires. |  |  |
| 106 | Use safe procedures to follow when lifting and carrying heavy objects. |  |  |
| 107 | Describe the importance of safety as it relates to environmental issues. |  |  |
| 108 | Identify potential hazards when working with power supplies. |  |  |
| 109 | Identify proper disposal procedures for batteries, display devices, and all other electronic equipment. |  |  |
| 110 | Identify proper disposal procedures for chemical solvents and pressurized cans. |  |  |
| 111 | Prevent electrostatic discharge conditions. |  |  |
| 112 | RESERVED |  |  |
| 113 | Configure a computer's power management settings to maximize energy efficiency. |  |  |
| 114 | Maintain safe work area to avoid common accidents and injuries. |  |  |

## 200 Computer Hardware

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| Item | Task  | (X) Indicates Proficiency 1 | Secondary Course Crosswalk |
| 201 | Categorize storage devices and backup media. |   |   |
| 202 | Categorize the different types of computer cases. |   |   |
| 203 | Explain motherboard components, types, and features. |   |   |
| 204 | Categorize power supplies types and characteristics. |   |   |
| 205 | Explain the purpose and characteristics of CPUs and their features. |   |   |
| 206 | Explain cooling methods and devices. |   |   |
| 207 | Compare and contrast memory types, characteristics, and their purpose. |  |  |
| 208 | Distinguish between the different display devices and their characteristics. |  |  |
| 209 | Summarize the function and types of adapter cards. |  |  |
| 210 | Install and configure peripherals and input devices. |  |  |
| 211 | Configure and optimize portable devices, such as laptops, tablets, and smart devices. |  |  |
| 212 | Install and configure printers. |  |  |
| 213 | Install configure and maintain personal computer components. |  |  |
| 214 | Repair/replace desktop and laptop computer components. |  |  |
| 215 | RESERVED |  |  |
| 216 | Implement RAID solutions. |  |  |

## 300 Troubleshooting, Repair and Maintenance

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| Item | Task  | (X) Indicates Proficiency 1 | Secondary Course Crosswalk |
| 301 | Apply industry standard troubleshooting methods. |  |   |
| 302 | Troubleshoot common hardware and operating system symptoms and their causes. |  |   |
| 303 | RESERVED |  |  |
| 304 | Identify common laptop issues and determine the appropriate basic troubleshooting method. |  |  |
| 305 | Integrate common preventative maintenance techniques. |  |  |
| 306 | RESERVED |  |  |
| 307 | Diagnose and repair common printer issues. |  |  |

## 400 Operating Systems and Software

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| Item | Task  | (X) Indicates Proficiency 1 | Secondary Course Crosswalk |
| 401 | Identify different operating systems by their features. |  |   |
| 402 | Use various user interfaces. |  |   |
| 403 | Install and configure an operating system. |  |  |
| 404 | Explain boot sequences, methods, and startup utilities for various operating systems. |  |  |
| 405 | Select the appropriate commands and options to troubleshoot and resolve problems. |  |  |
| 406 | Differentiate between various operating system directory structures. |  |  |
| 407 | Use system utilities/tools and evaluate the results. |  |  |
| 408 | Troubleshoot common OS and software issues. |  |  |
| 409 | Manage local users, groups, and institute local security policies. |  |  |
| 410 | Install and configure a network and workstation operating system. |  |  |

## 500 Network Technologies

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| Item | Task  | (X) Indicates Proficiency 1 | Secondary Course Crosswalk |
| 501 | Explain the function of common networking protocols, such as FTP, TCP/IP suite, DHCP, DNS. |   |   |
| 502 | Identify commonly used TCP and UDP default ports, including TCP ports: FTP – 20, 21, SSH – 22, TELNET – 23, HTTP – 80. |   |   |
| 503 | Identify address formats, including IPv6, IPv4, MAC.  |  |  |
| 504 | 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). |  |  |
| 505 | Identify common IPv4 and IPv6 routing protocols, including link state, distance vector, and hybrid protocols. |  |  |
| 506 | 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).  |  |  |
| 507 | Identify the characteristics of wireless communication, including 802.11 and 802.15 standards: speeds, distance, channels, frequency, authentication, and encryption. |  |  |
| 508 | Identify the basic elements of unified communication technology, such as VoIP, video, real time services, POS, and UC devices |  |  |
| 509 | Implement technologies that support cloud computing. |  |  |
| 510 | Implement virtualization technologies. |  |  |

## 600 Network Media and Topologies

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| Item | Task  | (X) Indicates Proficiency 1 | Secondary Course Crosswalk |
| 601 | 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.  |   |   |
| 602 | Identify common connector types, including UTP, STP, coaxial, and fiber. |   |   |
| 603 | Identify common physical network topologies. |   |   |
| 604 | Differentiate and fabricate cables according to TIA/EIA 568A and 568B standards, including patch, crossover, and rollover cables. |   |   |
| 605 | Categorize common WAN technology types and properties. |  |  |
| 606 | Categorize common LAN technology types and ethernet properties, e.g., CSMA/CD, broadcast, collision, bonding, speed, distance.  |  |  |
| 607 | Explain common logical network topologies and their characteristics, including peer to peer and client/server. |  |  |
| 608 | Install components of wiring distribution, including vertical and horizontal cross connects, verify installation and termination and environmental requirements.  |  |  |

## 700 Network Devices

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| Item | Task  | (X) Indicates Proficiency 1 | Secondary Course Crosswalk |
| 701 | Install, configure, and differentiate between common network connectivity devices.  |   |   |
| 702 | 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. |  |  |
| 703 | Explain the advanced features of a switch, such as PoE, spanning tree, VLAN, trunking, port mirroring, port authentication. |  |  |
| 704 | Install a basic wireless network, including client configuration, access point placement and installation. |  |  |
| 705 | Configure appropriate encryption, configure channels and frequencies, set ESSID and beacon, and verify installation.  |  |  |

## 800 Network Management

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| Item | Task  | (X) Indicates Proficiency 1 | Secondary Course Crosswalk |
| 801 | Explain, compare, and contrast the layers of the TCP/IP and OSI models. |   |   |
| 802 | Prepare physical and logical network diagrams, baselines, policies, procedures, and configurations and regulations. |   |   |
| 803 | 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.  |   |   |
| 804 | Conduct network monitoring to identify performance and connectivity issues, such as packet sniffers, connectivity software, load testing, throughput testers, system logs, history logs, and event logs. |  |  |
| 805 | RESERVED |  |  |
| 806 | Implement remote management technologies. |  |  |

## 900 Network Tools and Troubleshooting

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| Item | Task  | (X) Indicates Proficiency 1 | Secondary Course Crosswalk |
| 901 | Utilize command line/graphical tools and interpret the output to verify functionality including, Traceroute, Ipconfig, Ifconfig, and Ping. |   |   |
| 902 | Use network scanners, such as packet sniffers, intrusion detection software, Intrusion prevention software, and port scanners.  |   |   |
| 903 | Utilize the appropriate hardware tools for cable fabrication and troubleshooting. |   |   |
| 904 | Implement network troubleshooting methodologies, including information gathering – identify symptoms and problems, identify the affected areas of the network. |  |  |
| 905 | 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.  |  |  |
| 906 | Troubleshoot common wired and wireless connectivity issues and select an appropriate solution to include physical and logical issues. |  |  |
| 907 | Troubleshoot and resolve common WAN issues, such as loss of connectivity, DNS, router configurations, and default gateways. |  |  |

## 1000 Security Fundamentals

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| Item | Task  | (X) Indicates Proficiency 1 | Secondary Course Crosswalk |
| 1001 | Configure hardware and software security devices, such as network-based firewall, host-based firewall, DMZ, IDS, IPS, VPN concentrator. |   |   |
| 1002 | Implement features of a network firewall, such as application layer vs. network layer, stateful vs. stateless, scanning services, content filtering, signature identification, zones.  |   |   |
| 1003 | Configure network access security, such as ACL: MAC filtering, IP filtering tunneling and encryption: SSL VPN, VPN, L2TP, PPTP and related others.  |   |   |
| 1004 | Differentiate the principals of user authentication, such as PKI, Kerberos, AAA: RADIUS, TACACS+, network access control: 802.1x, CHAP, MS-CHAP, EAP.  |  |  |
| 1005 | Evaluate issues that affect device security, such as physical security and network access. |  |  |
| 1006 | Identify and mitigate common security threats. |  |  |
| 1007 | Demonstrate security features, including BIOS security, password management, locking workstations, and biometrics. |  |  |
| 1008 | Demonstrate basic forensic concepts, such as incident response, chain of custody, evidence preservation, and documentation. |  |  |

## 1100 Communication and Professionalism

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| Item | Task  | (X) Indicates Proficiency 1 | Secondary Course Crosswalk |
| 1101 | Use effective communication with customers, such as proper etiquette, active listening, and cultural sensitivity. |   |   |
| 1102 | Solve customer problems. |   |   |
| 1103 | Implement and adhere to acceptable use policies. |   |   |
| 1104 | Maintain customer confidentiality. |  |  |
| 1105 | Maintain asset inventory.  |  |  |

1 Student Demonstrated Entry-Level Industry Proficiency as Indicated by (X)

Secondary CTE Instructor Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_