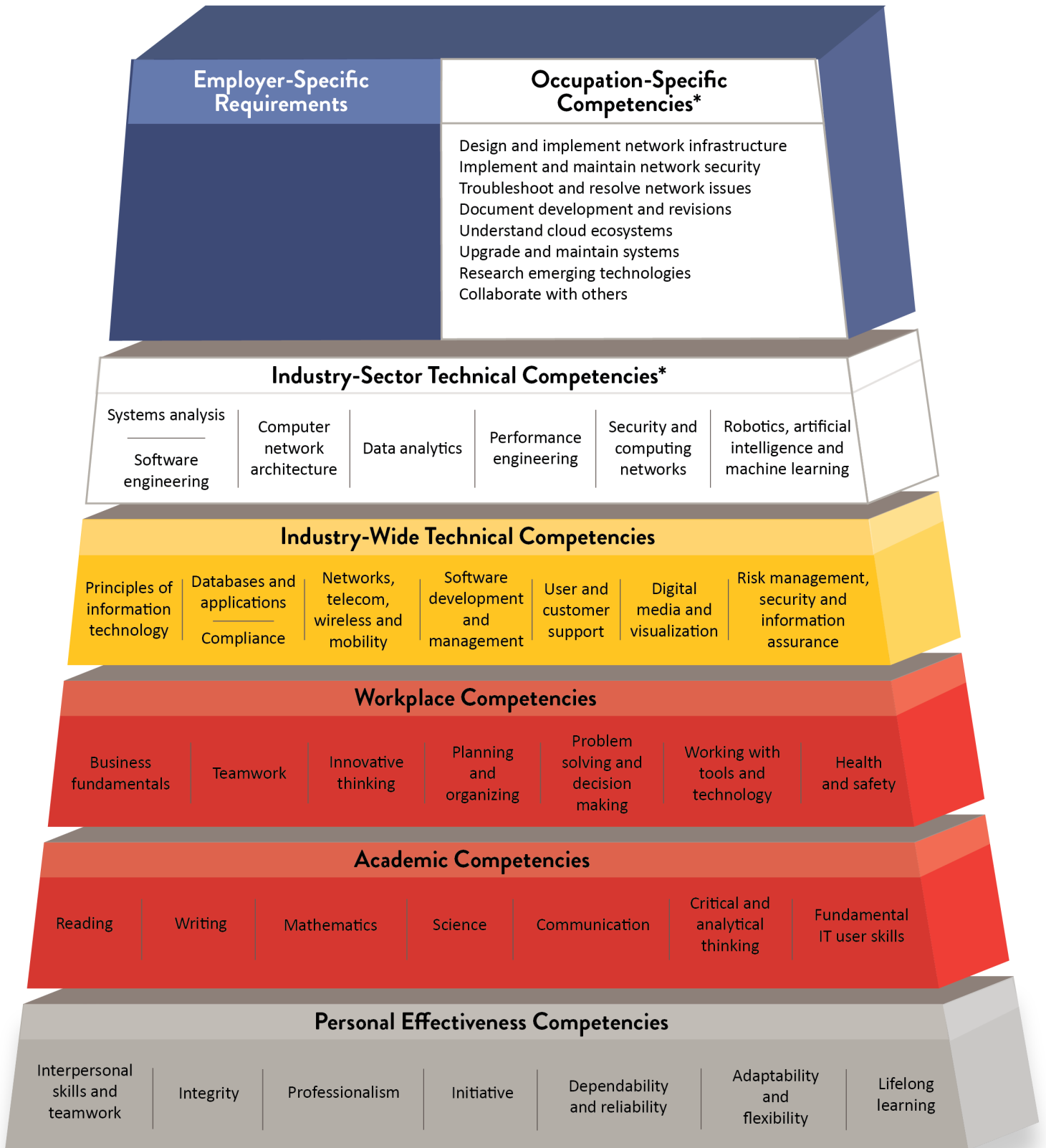


Minnesota Dual-Training Pipeline

Competency Model for Information Technology

Occupation: Network Engineer



Based on: Information Technology Competency Model, Employment and Training Administration, United States Department of Labor, February 2025. For more detailed information about competency model creation and sources, visit dli.mn.gov/business/workforce/information-technology.

Competency Model for Network Engineer

Network Engineer – A technology professional who is highly skilled in planning, constructing, and managing networks to ensure they are optimized and functioning as intended. This person is responsible for the foundation of an organization’s information technology system.

*Pipeline recommends the Industry-Sector Technical Competencies as formal training opportunities (provided through related instruction) and the Occupation-Specific Competencies as on-the-job (OJT) training opportunities.

Industry-Sector Technical Competencies

Related Instruction for dual training means the organized and systematic form of education resulting in the enhancement of skills and competencies related to the dual trainee’s current or intended occupation.

- **Systems analysis** – Able to study a procedure or business to identify its goals and purposes and create systems and procedures that will achieve them in an efficient way.
- **Software engineering** – Understand the detailed study of engineering to the design, development, and maintenance of software.
- **Computer network architecture** – Understand specifications detailing how a set of software and hardware technology standards interact to form a computer system or platform.
- **Data analytics** – Understand the science of examining raw data with the purpose of discovering knowledge and how that data interacts with the overall network.
- **Performance engineering** – Demonstrated understanding of the techniques applied during a systems development life cycle to ensure the non-functional requirements for performance will be met.
- **Security and computing networks** – Understand rules and configurations designed to protect the integrity, confidentiality, and accessibility of computer networks and data using both software and hardware technologies.
- **Robotics, artificial intelligence, and machine learning** – Understand hybrid technology integration to execute tasks and solve problems.

Occupation-Specific Competencies

On-the-Job Training is hands-on instruction completed at work to learn the core competencies necessary to succeed in an occupation. Common types of OJT include job shadowing, mentorship, cohort-based training, assignment-based project evaluation and discussion-based training.

- **Design and implement network infrastructure** – Know how to analyze, design, install, configure, maintain, and repair network infrastructure and application components to meet company and user satisfaction.
- **Implement and maintain network security** – Know how to utilize firewalls and virtual private networks (VPNs) to safeguard infrastructure against cyber threats and unauthorized access.
- **Troubleshoot and resolve network issues** – Diagnose connectivity problems, hardware failures, and configuration errors to restore service quickly.
- **Document development and revisions** – Know and practice the discipline of recording steps and changes in network development and maintenance.
- **Understand cloud ecosystems** – Understand how cloud technology works in network computing.
- **Upgrade and maintain systems** – The act of rolling out improvements to network systems, which are required for integration with other systems and programs.
- **Research emerging technologies** – Understand how to research, learn, and adapt new networking standards, cloud platforms, and security practices to future-proof infrastructure.
- **Collaborate with others** – Understand how to work with various teams, vendors, clients and others for the implementation and support of networking products and services.

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