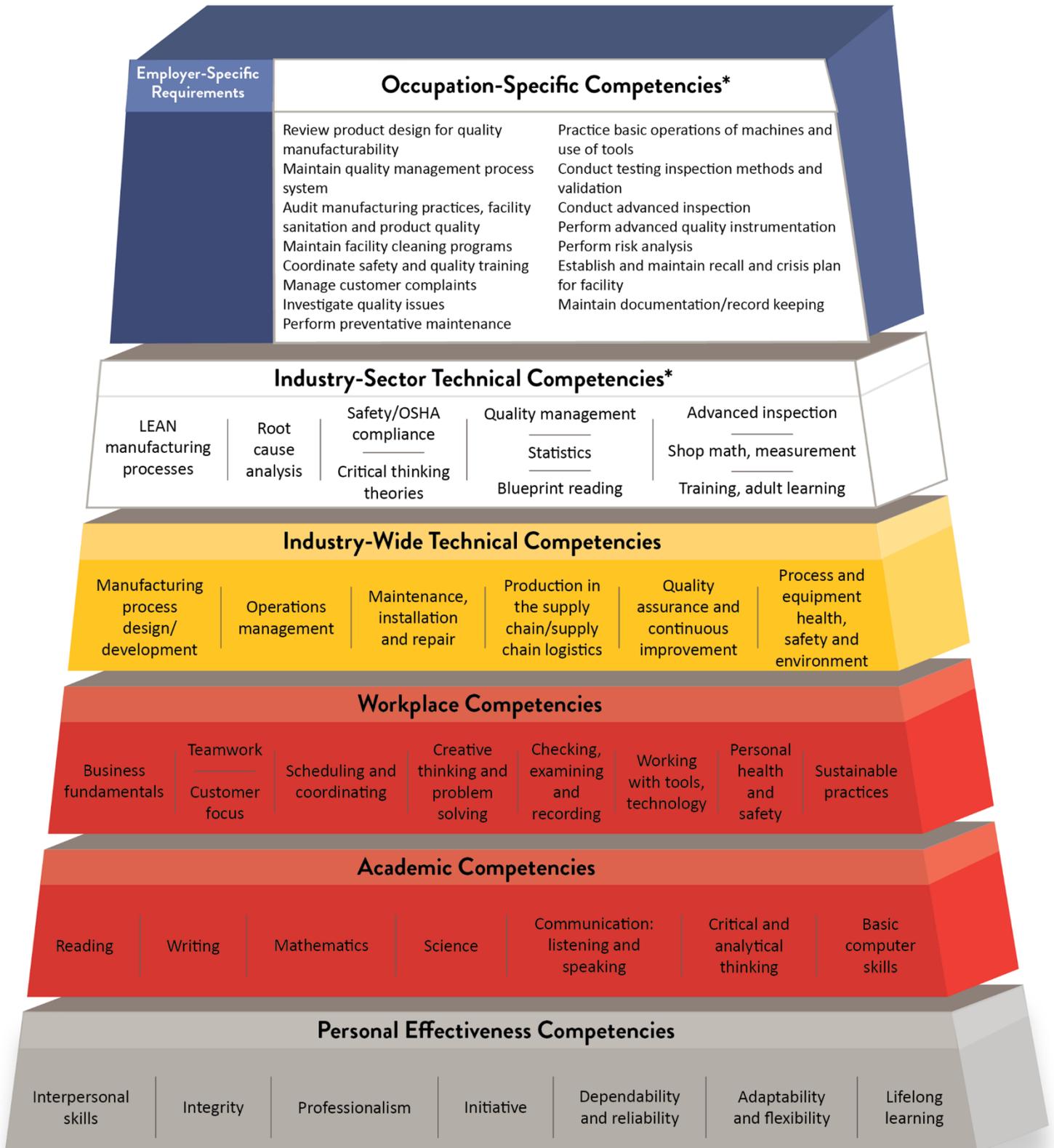


Minnesota Dual-Training Pipeline

Competency Model for Advanced Manufacturing

Occupation: Quality Assurance Technician



Based on: Advanced Manufacturing 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/advanced-manufacturing.

Competency Model for Quality Assurance Technician

Quality assurance technician – An individual who contributes to quality assurance for a manufacturing company, which includes developing, applying, and maintaining quality requirements for processing components and other materials into finished goods and products. This includes reviewing product designs for manufacturability, maintaining documentation regarding quality management, continuous improvement, investigating quality issues, root cause analysis, testing and inspection, risk analysis, LEAN principles, management principles and training/adult learning.

*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.

- **LEAN manufacturing processes** – Understand the systematic method for waste minimization within a manufacturing system without sacrificing productivity; considers waste created through overburden and waste created through unevenness of workload.
- **Root cause analysis** – A method of problem solving used for identifying the root causes of faults or problems. The analysis could also suggest methods of addressing problems at their source.
- **Safety/ OSHA compliance** – Understand the process and systems to ensure compliance with the occupational safety and health act and overall safety of operations.
- **Critical thinking theories** – Understand the theories that encapsulate the objective analysis of facts to form a judgment. A Quality Assurance Technician would need this ability and the understanding of the theories to approach several different quality assurance processes holistically.
- **Quality management** – Know how to oversee the systems in place at a facility that are directly connected to quality assurance practices of the facility.

- **Statistics** – Utilizing mathematics to deal with the collection, analysis, interpretation, presentation, and organization of data as it relates to consistency of high-quality product standards being met for production.
- **Blueprint reading** – Demonstrate basic understanding of reading and understanding industrial prints such as geometric dimensioning and tolerancing (GD&T).
- **Advanced inspection** – Able to use measuring instruments relating to state-of-the-art manufacturing environments, such as coordinate measuring machine and calibration. Understanding of Quality Control, TQM, and SPC processes as they relate to manufacturing environments.
- **Shop math, measurement** – Demonstrate basic understanding of math including linear measurement, metrics and beginning algebra, as well as SPC (statistics) used for data collection.
- **Training, adult learning** – Understand how to effectively train and present material to adult learners.

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.

- **Review product design for quality manufacturability** – Be involved with the design process of the product development to ensure that the production facility will have capacity to build the product and ensure its consistent set of quality standards.
- **Maintain quality management process system** – Establish and maintain a routine and consistent approach to quality assurance and quality management.
- **Audit manufacturing practices, facility sanitation and product quality** – Demonstrate the ability to regularly scrutinize and audit facility practices in manufacturing and sanitation/cleanliness as well as to ensure that products are consistently meeting a set standard.
- **Maintain facility cleaning programs** – Demonstrate the ability to establish a regular schedule of cleaning and maintaining machinery and work areas.
- **Coordinate safety and quality training** – Establish and maintain the timing and delivery of training for team members to ensure safety on the job and training for team members to take the time to create quality products.

- **Manage customer complaints** – Demonstrate a strong, steam-lined approach to providing excellent customer service, especially to customers with complaints or issues; demonstrate the ability to establish a training plan for team members to do the same.
- **Investigate quality issues** – Demonstrate the ability to independently research possibly quality issues with product or process.
- **Perform preventative maintenance** – Machine tools maintenance – Practice industry approved procedures for preventative maintenance on quality machines and tools.
- **Practice basic operations of machines and use of tools** – Demonstrate basics understanding of how, when, and why to use specific machines and tools.
- **Conduct testing inspection methods and validation** – Demonstrate the proper methods and instruments used to effectively inspect parts and completed products meeting a defined set of standards in the shop.
- **Conduct advanced inspection** – Understanding of quality control, total quality management (TQM), and statistical process control (SPC) processes as they relate to manufacturing environments.
- **Perform advanced quality instrumentation** – Demonstrate ability to use precise measuring and data collection tools to ensure product quality standards are met.
- **Perform risk analysis** – Demonstrate how to determine how the production of a product may result in safety concerns and plan accordingly to mitigate those concerns.
- **Establish and maintain recall and crisis plan for facility** – Demonstrate the ability to establish and maintain the process when a facility needs to react to crisis or carry out a product recall.
- **Maintain documentation/ record keeping** – Understand how maintain a history of product quality control measures by writing down and/or saving via computer a record of what errors occur on parts and products.

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