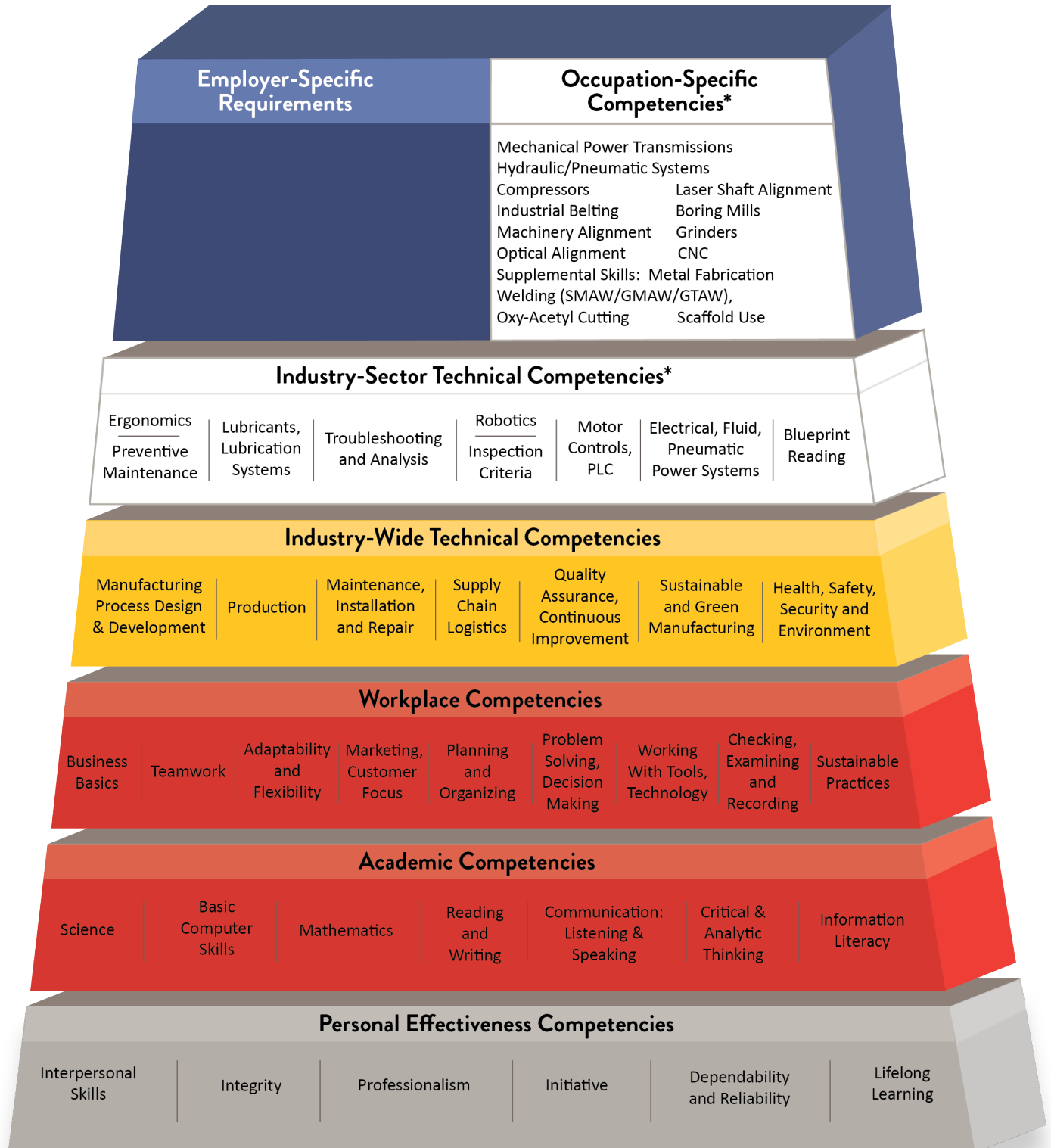


# Minnesota Dual-Training Pipeline

## Competency Model for Advanced Manufacturing Occupation: Maintenance and Repair Worker



Based on: Advanced Manufacturing Competency Model Employment and Training Administration, United States Department of Labor, April 2010.

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



## Competency Model for Maintenance and Repair Worker

**Maintenance and repair worker** – Individual who works in manufacturing whose job it is to maintain and repair factory equipment and other industrial machinery, such as conveying systems, production machinery, and packaging equipment.

### 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.

- **Ergonomics** – Knowledge of how to modify machines so operation is safe and productive for operator.
- **Preventative maintenance** – Training to anticipate and prevent potential malfunction of tools and machinery.
- **Lubricants/lubrication systems** – Understanding of why lubricants and lubricant systems are used and when it is most beneficial to use them.
- **Troubleshooting and analysis** – Training in troubleshooting issues with machinery using tools and knowledge of machinery.
- **Robotics** – Understand how to maintain and repair robotic devices.
- **Inspection criteria** – Know how to do proper machine inspection.
- **Motor controls and PLCs** – Understanding of how to program motor controls and PLCs and how to use them for interfacing, operation, and programming.
- **Blueprint reading** – Training on how to interpret blueprints and use those blueprints to build reliable and serviceable objects.

- **Electrical, fluid, pneumatic power systems** – Understand how electrical, fluid, and pneumatic power systems function, and know how to maintain them.

## Occupation-Specific Competencies

**On-the-Job Training (OJT)** 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.

- **Mechanical power transmissions** – Demonstrate machine operation with power transmissions and how to maintain and repair them.
- **Hydraulic/Pneumatic systems** – Demonstrate function and operation of hydraulic and pneumatic systems and how to maintain and repair them.
- **Machinery alignment** – Ability to align machinery for proper operation.
- **Optical alignment** – Ability to align advanced optical systems.
- **CNC** – Perform maintenance and repair on CNC machines.
- **Compressors** – Perform repair and maintenance on factory compressors.
- **Laser shaft alignment** – Demonstrate proper alignment principles and practices including troubleshooting by use of a laser shaft alignment tool.
- **Industrial belting** – Maintain and repair industrial belting assembly systems.
- **Boring mills** – Maintain and repair boring mills.
- **Grinders** – Perform grinding on parts as needed, as well as maintain grinding equipment.

## Supplemental Skills – May be required depending on employer

- **Welding (SMAW, GMAW, GTAW)** — Exhibit knowledge of the safe operation of welding equipment and the welding skills needed to perform repair to machines.
- **Metal fabrication** – Know how to perform metal fabrication.

- **Oxy-acetyl cutting** – Know how to perform oxy-acetyl cutting.
- **Scaffold use** — Demonstrate how to safely ascend and perform job functions while using a scaffold.

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