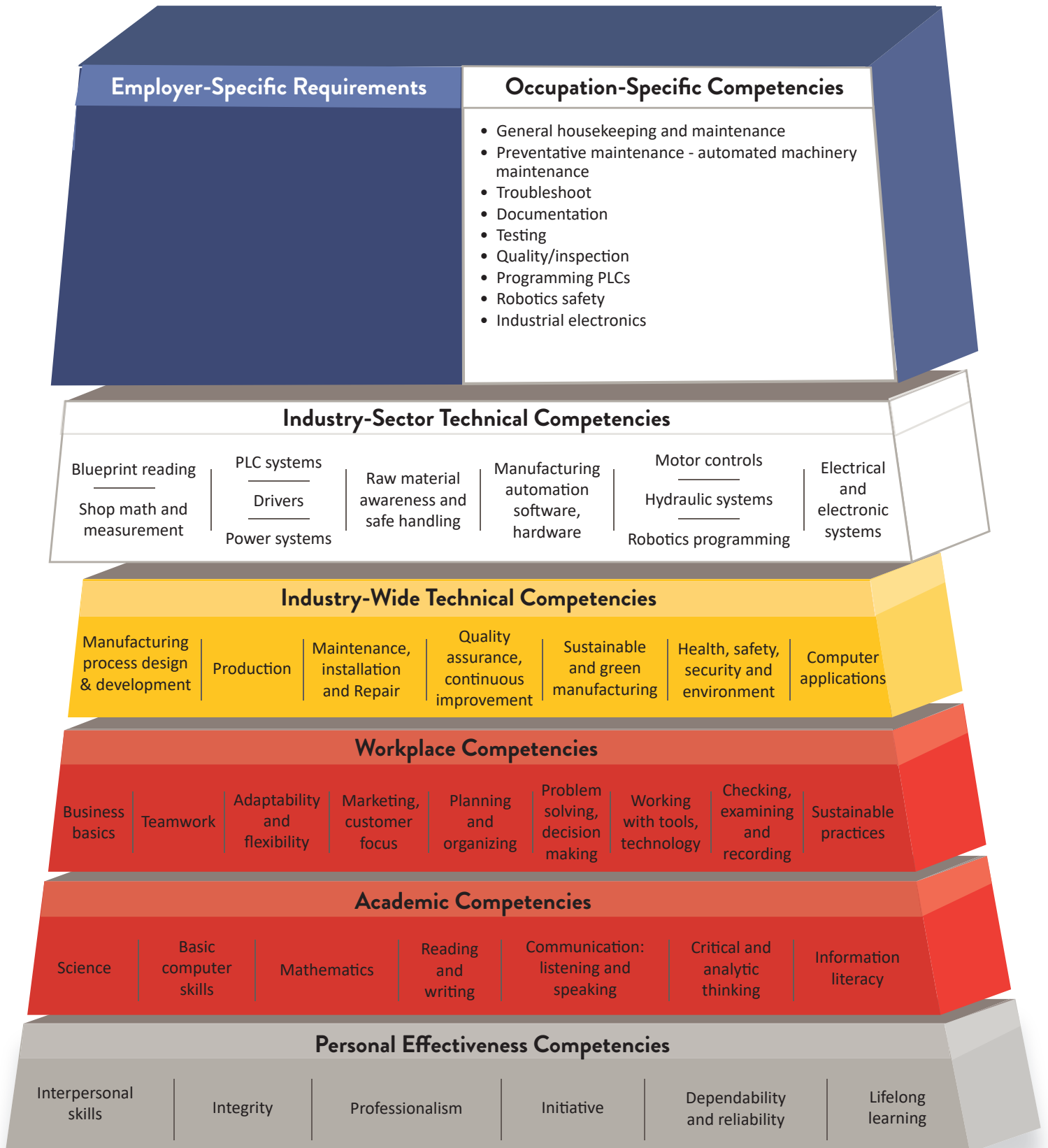


Minnesota Dual-Training Pipeline

Competency Model for Advanced Manufacturing

Occupation: Robotics Operator



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



Robotics operator – This position is responsible for providing general robotic and automation oversight and support for manufacturing operations. The individual will run the automated equipment while leading some programming and other necessary steps to set up the machine. Also, robotics operators perform general machine oversight and basic work cell installation and updates. Lastly, robotics operators are responsible for routine and preventative maintenance of automated equipment.

Industry-Sector Technical Competencies

- Blueprint reading—Knowledge in reading and understanding industrial prints.
- Shop math and measurement – Understanding of basic math including linear measurement, metrics and algebra.
- Raw material awareness and safe handling – Understanding of the different raw materials possibly involved in production and how certain machine settings, temperatures, etc. can potentially impact different materials.
- Power systems – Understanding of principles of electricity through both its effect and needs for product development, implementation and production.
- Manufacturing automation software/hardware – Knowledge of basics of PLC programming, CAD/ CAM software, how to use robotics software and hardware and how robotics and automation factor into overall manufacturing design and production processes.
- PLC systems – Understanding of the functions of PLC systems in order to achieve desired outcomes.
- Motor controls – Understanding of industrial motor control principles including how they are installed, maintained and how to do very basic repairs.
- Hydraulic systems – Understanding of how hydraulic systems function and their applications and integration with PLCs.
- Drivers – Understanding of the components and applications of drivers in order to achieve desired outcomes.
- Electrical and electronic systems – Knowledge of how to safely operate, do very basic repair, and understand electrical and electronic systems.
- Robotics programming – Understand the basic ways to program the robot through offline, SCADA, human machine interface (HMI), and vision programming for example.

Occupation-Specific Competencies

- General housekeeping and maintenance – Understanding of how to maintain tools and automation-based machinery with basic cleaning and maintenance procedures.

- Preventative maintenance- automated machinery maintenance – Knowledge of how to practice industry approved procedures to oversee and do preventative maintenance on automated and robotics-based machinery and equipment.
- Troubleshoot – Knowledge of how to strategically think through what may be causing quality defects as well as machine / equipment issues and quickly brainstorm and implement approaches to address these concerns.
- Documentation – Understanding of how to maintain a record of procedures which represent work processes.
- Testing – Know how to test runs of modules and assembled automated systems.
- Quality / inspection – Understanding of how to check assembled parts to ensure that the robot / automated equipment is making things according to plan.
- Programming PLC's—Demonstrate PLC programming including digital and industrial field buses.
- Robotics safety—Understand how to interact, operate, and function around the robotics/ automated equipment in a manner that ensures the robot does not cause injury to oneself or others.
- Industrial electronics – Know the basic principles and applications of equipment, tools and processes that involve electrical production equipment in the manufacturing setting.

Robotics Operator Occupational Competency Training Plan

Related Instruction means an organized and systematic form of instruction designed to provide the apprentice with the knowledge of the theoretical and technical subjects related to the apprentice's trade of occupation, or industrial courses or, when of equivalent value, by correspondence, electronic media, or other forms or self-study approved by the commissioner.

	Course	Course Description	Credit/Non-Credit	Hours Spent on Competency
Blueprint Reading				
Shop math and measurement				
Raw material awareness and safe handling				
Power systems				
Manufacturing automation software/hardware				
PLC systems				

Motor controls				
Hydraulic systems				
Drivers				
Electrical and electronic systems				
Robotic programming				

On-The-Job Training is the work experience and instruction. Training experience need not be in the exact order as listed below.

	Trainer/Instructor	Name of person responsible for verifying competency mastery	Hours spent on competency
General housekeeping and maintenance			
Preventative maintenance – automated machinery maintenance			
Troubleshoot			
Documentation			
Testing			
Quality/ inspection			
Programming PLC's			
Robotics safety			
Industrial electronics			