

Manufacturing Career Pathways & Skill Standards (Credentials)

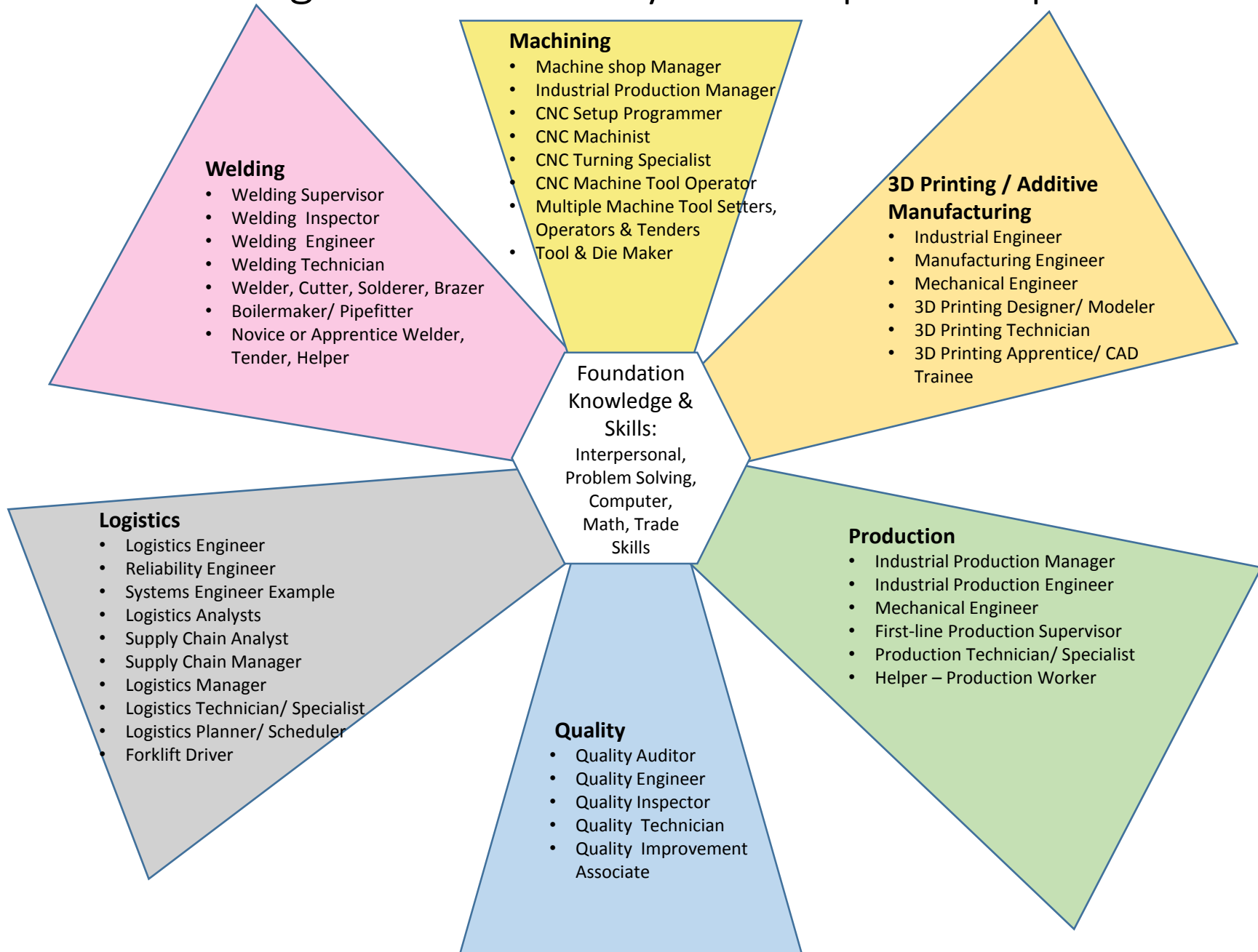
Graphic Model

*Prepared by the Center for Individual & Organizational Effectiveness (C4IOE.com)
for the Tri-County Workforce Investment Board – Butler, Pennsylvania
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This Graphic Model accompanies a Manufacturing Report and a Descriptive Model of Manufacturing Career Pathways & Skill Standards, which are all available on the Tri-County Workforce Investment Board website. References / Sources for this model are listed in the Report. This model is not intended to identify ALL manufacturing occupations (and their related credentialing requirements), but does identify representative occupations within each of the occupational clusters.



Manufacturing Career Pathways & Sample Occupations



Manufacturing Career Pathway & Training / Skill Standards

Welding

Masters Degree ** 5 or More Years Experience**

Example Required Credentials: No occupations / credentials were identified at this level. However, there may be occupations not yet identified

Sample Job titles include: No occupations / credentials were identified at this level. However, there may be occupations not yet identified

Bachelor's Degree ** 4 Years Experience**

Example Required Credentials: BA or BS in Welding Technology, Welding / Fabrication Engineering, Industrial Engineering, Materials Science. May still require some OJT or AWS certification, such as AWS Specification for the Qualification of Welding Inspectors.

Sample Job titles include: Welding Engineer, Welding Inspector, Welding Supervisor

Associate's Degree ** 2-4 Years Experience**

Recommended Credentials: May still require some OJT or AWS certification, such as AWS Certified Welding Engineer (CWEng).

Sample Job titles include: Welding Technician, Welding Engineer

Non-Degree Certificate ** 1-2 Years Experience**

Recommended Credentials: OJT and/ or AWS Specification for the Qualification of Welding Technicians (pending)

Sample Job titles include: Welding Technician

High School Diploma or Equivalent ** 0-1 Years Experience**

Recommended Credentials: apprenticeship or other additional training, such as OJT, trade school or union sponsored classes, would be a benefit and may be required for some jobs

Sample Job titles include: Welder, Cutter, Solderer, Brazer / Boilermaker / Pipefitter

No Specific Education Requirement ** 0 Years Experience**

Sample Job titles include: Novice or Apprentice Welder, Tender, Helper

Manufacturing Career Pathway & Training / Skill Standards

Machining

Masters Degree ** 5 or More Years Experience**

Example Required Credentials: No occupations / credentials were identified at this level. However, there may be occupations not yet identified

Sample Job titles include: No occupations / credentials were identified at this level. However, there may be occupations not yet identified

Bachelor's Degree ** 5 Years Experience**

Example Required Credentials: Bachelor's degree in Business Administration or related + considerable amount of work-related skill, knowledge, or experience. Certifications may be necessary, such as: ACIPS: Certified in Production and Inventory Management, ATMAE: Certified Senior Technology Manager

Sample Job titles include: Machine shop Manager, Industrial Production Manager, Technology Manager

Associate's Degree ** 2+ Years Experience**

Example Required Credentials: Associates degree or training in vocational schools, apprenticeship, related on-the-job experience, possible NIMS credentials.

Sample Job titles include: CNC Setup Programmer

Non-Degree Certificate ** 1-2 Years Experience**

Example Required Credentials: students enroll in for-credit or certificate-based program and earns industry credentials and/or OJT; possible NIMS credentials, such as CNC Milling: Programming Setup & Operations

Sample Job titles include: CNC Machinist/ Tool & Die Makers/ CNC Turning Specialist/ CNC Milling Specialist/ Multiple Machine Tool Setters, Operators & Tenders

High School Diploma or Equivalent ** 0-1 Years Experience**

Example Required Credentials: some OJT or trade school; NIMS credentials, such as Machining Level I

Sample Job titles include: CNC Operator/ CNC Machine Tool Operator

No Specific Education Requirement ** 0 Years Experience**

Sample Job titles include: Apprentice or Novice Machinist

Manufacturing Career Pathway & Training / Skill Standards

3D Printing / Additive Manufacturing

Masters Degree ** 5 or More Years Experience**

Example Required Credentials: No occupations / credentials were identified at this level. However, there may be occupations not yet identified

Sample Job titles include: No occupations / credentials were identified at this level. However, there may be occupations not yet identified

Bachelor's Degree ** 0-2 Years Experience**

Example Required Credentials: BA in industrial engineering, mechanical engineering, manufacturing engineering, industrial engineering technology, electrical engineering, computer science or general engineering; may also require work-related skill, knowledge, or experience.

Sample Job titles include: 3D Printing Modeler / Designer, Industrial Engineer, Manufacturing Engineer, Mechanical Engineer

Associate's Degree ** 0-1 Years Experience**

Example Required Credentials: Associate's degree or BA in multimedia design or equivalent and some prior experience in 3D/ CAD design and modeling

Sample Job titles include: 3D Printing Technician, 3D Printing Modeler / Designer

Non-Degree Certificate ** 2-3 Years Experience**

Example Required Credentials: No occupations / credentials were identified at this level. However, there may be occupations not yet identified

Sample Job titles include: No occupations / credentials were identified at this level. However, there may be occupations not yet identified

High School Diploma or Equivalent ** 0-1 Years Experience**

Example Required Skills: Knowledge of CAD skills and 3D printing software

Sample Job titles include: 3D Printing Apprentice, CAD Trainee

No Specific Education Requirement ** 0-1 Year Experience**

Example Required Credentials: Example Required Credentials: No occupations / credentials were identified at this level. However, there may be occupations not yet identified

Sample Job titles include: No occupations / credentials were identified at this level. However, there may be occupations not yet identified

Manufacturing Career Pathway & Training / Skill Standards

Production

Masters Degree ** 5 or More Years Experience**

Example Required Credentials: No occupations / credentials were identified at this level. However, there may be occupations not yet identified

Sample Job titles include: No occupations / credentials were identified at this level. However, there may be occupations not yet identified

Bachelor's Degree ** 5 Years Experience (generally)**

Example Required Credentials: BA in industrial engineering, mechanical engineering, electrical engineering

Sample Job titles include: Industrial Production Manager, Industrial Production Engineer, Mechanical Engineer

Associate's Degree ** 2 or more Years Experience**

Example Required Credentials: AS or BA degree, or 1 or more years work experience

Sample Job titles include: First-line production supervisor

High School Diploma or Equivalent ** 3-12 months experience**

Example Required Credentials: OJT, work experience

Sample Job titles include: Production Technician or Specialist

Non-Degree Certificate ** 2-3 Years Experience**

Example Required Credentials: No occupations / credentials were identified at this level. However, there may be occupations not yet identified

Sample Job titles include: No occupations / credentials were identified at this level. However, there may be occupations not yet identified

No Specific Education Requirement ** 0 Years Experience**

Sample Job titles include: Helper - Production Worker

Manufacturing Career Pathway & Training / Skill Standards

Quality

Masters Degree ** 8 or More Years Experience**

Example Required Credentials: No occupations / credentials were identified at this level. However, there may be occupations not yet identified

Sample Job titles include: No occupations / credentials were identified at this level. However, there may be occupations not yet identified

Bachelor's Degree ** or up to 8 Years Experience**

Example Required Credentials: Certification (may or may not be required) stipulates 8 yrs of job experience, with 3 in a decision-making position. Varying years of work experience can be waived with the completion of a 2 or 4-year degree or greater.

Sample Job titles include: Quality Engineer, Quality Auditor, Quality Technician (certified), Quality Inspector (certified)

Associate's Degree ****

Example Required Credentials: Some employers may require certification or a college degree in quality technology or other engineering technology degrees. 4 yrs of work experience, or an AS + 2years, or a BA is needed for certification.

Sample Job titles include: Quality Technician, Quality Inspector

Non-Degree Certificate ** 2 Years Experience**

Example Required Credentials: 2 years experience, or an AS

Sample Job titles include: Quality Improvement Associate (certified)

High School Diploma or Equivalent ** 0 Years Experience**

Sample Job titles include: Quality Improvement Associate

No Specific Education Requirement ** 0-1 Year Experience**

Example Required Credentials: Example Required Credentials: No occupations / credentials were identified at this level. However, there may be occupations not yet identified

Sample Job titles include: No occupations / credentials were identified at this level. However, there may be occupations not yet identified

Manufacturing Career Pathway & Training / Skill Standards

Logistics

Bachelor's Degree + 5 years experience or Masters degree

Example Required Credentials: BA (usually in engineering, logistics or transportation) + considerable amount of work-related skill, knowledge, or experience.; or MA and/or certification, such as Certified Master Logistician (CML) and Certified Professional Logistician (CPL).

Sample Job titles include: Logistics Engineer, Reliability Engineer, Systems Engineer

Bachelor's Degree

Example Required Credentials: BA is typically required for most positions (business, systems engineering, or supply chain management is common), although an associate's degree may be sufficient for some positions. Recommended: Certification through APICS or the International Society of Logistics, such as Demonstrated Senior Logistician (DSL) and Certified Master Logistician (CML).

Sample Job titles include: Logistician, Supply Chain Manager, Logistics Manager, Logistics Analysts
Supply Chain Analyst

Associate's Degree

Example Required Credentials: Certification through APICS or the International Society of Logistics, such as Demonstrated Logistician (DL) or Demonstrated Master Logistician (DML). Some positions may require a BA.

Sample Job titles include: Logistics Technician/ Specialist

Non-Degree Certificate ** 2-3 Years Experience**

Example Required Credentials: No occupations / credentials were identified at this level. However, there may be occupations not yet identified

Sample Job titles include: No occupations / credentials were identified at this level. However, there may be occupations not yet identified

High School Diploma or Equivalent ** 1-2 months OJT Experience**

Sample Job titles include: Logistics Planner/ Scheduler

No Specific Education Requirement ** 1 month OJT Experience**

Example Required Credentials: sometimes HS diploma required

Sample Job titles include: Forklift Driver