



OPPORTUNITIES IN ADVANCED MANUFACTURING

IOWA CAREER PATHWAYS



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**COMMUNITY COLLEGES &
WORKFORCE PREPARATION**
PROSPERITY THROUGH EDUCATION

This project was completed by the Iowa Department of Education, in support of the Future Ready Iowa Initiative, through a public/private collaboration with the Iowa Association of Business and Industry and Elevate Advanced Manufacturing. Special thanks to Eastern Iowa Community Colleges, Hawkeye Community College, Western Iowa Tech Community College, Accumold, Iowa Workforce Development, and the Iowa Economic Development Authority. Quantitative research was conducted to identify the most common occupations in advanced manufacturing in Iowa, in addition to a series of online surveys and in-person focus groups with manufacturers in the Quad Cities, Waterloo, Ankeny, and Sioux City. This direct employer feedback and support was vital in building job descriptions and employer expectations, while the included education and wage levels are based on labor market intelligence gathered from across the state.

FOREWORD

Iowa has developed a reputation as a reliable source of safe and affordable agriculture products that feed the world. However, what many do not know is that Iowa has also established a large global manufacturing footprint. Advanced manufacturing accounts for almost 90 percent of Iowa's exports and contributes \$29 billion to the state's economy, with over 30 percent of Iowa's counties classified as "manufacturing dependent." Iowa's 6,000-plus manufacturing companies employ over 215,000 people, representing more than 14 percent of the state's total employment and placing manufacturers in the top third of employers statewide¹. Careers in advanced manufacturing are expected to continue to grow in Iowa, largely due to amazing and innovative advances in technologies with robotics, augmented and virtual reality, and 3D printers. This growth will further increase the need for quality advanced manufacturing education and training programs across the state.

To meet these and similar workforce needs of industries across Iowa, the Governor's Office established the Future Ready Iowa Initiative with a goal of 70 percent of Iowans possessing education or training beyond high school by 2025. The Iowa Department of Education, in support of the Future Ready Iowa Initiative and the Governor's "Year of Manufacturing" initiative, partnered with Elevate Advanced Manufacturing and the Iowa Association of Business and Industry (ABI) to develop these promotional materials and career pathways to highlight a wide range of exciting career opportunities offered in the advanced manufacturing industry in Iowa.

A challenge to readers of this document, from students just beginning to learn about jobs to adults with extensive work experience who may be looking for a career transition, is to drop any preconceived notions or ideas they may have about this industry. The fact is that modern manufacturing facilities often have more in common with tech companies than with the dirty and outdated production and assembly plants often portrayed in the media. In addition, many manufacturers now offer engaging on-the-job learning models, such as Registered Apprenticeships that allow workers to earn a paycheck while learning.

No matter your experience, background, personality, or interests, you will find great opportunities in advanced manufacturing that offer a good paycheck, pride in creating something meaningful, and huge potential for long-term career growth.



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ELEVATE
ADVANCED MANUFACTURING

¹ Economic impact statistics retrieved from www.iowamfg.com.

WHAT ADVANCED MANUFACTURING MEANS TO ME

Through a series of focus groups and surveys, we asked Iowans what it means to work in advanced manufacturing. Below is a visual summary and a few examples of the responses we received. Although we found that this industry means something different to everyone, one finding was clear: This is not you grandparents' manufacturing industry.

“ Flexible schedules, vacation time, and overtime pay bonuses are great. ”

“ This is challenging and rewarding work, with no two days the same. ”

“ Manufacturing careers are evolving every day. ”

“ Sense of community with co-workers. ”

“ This is a career, not just a job. ”

“ I love welding since I am making art. ”



“ Pride in making a quality product. ”

“ We are building the future and creating the world you live in. ”

“ Great job security and a steady pay check. ”

“ Great transferable skills to other industries without the expensive costs of college. ”

“ Producing clean, useable biofuels that would have otherwise been dumped in a landfill and wasted. ”

TECHNOLOGIES OF THE FUTURE

Although innovative technologies are being used by manufacturers in Iowa, below are a few examples of technologies that have the potential to create new and exciting career opportunities. These technologies increase the need for a skilled workforce with information technology, advanced computers, and machine programming skills. Behind every new or improved machine are real people who program, operate, and maintain them.

ADDITIVE MANUFACTURING

Historically, the creation of complex parts needed to build and assemble products required the process of carefully grinding, cutting, bending, or otherwise removing portions of wood, metal, plastics, and other materials to create a new part, such as a gear or valve. This is not only time consuming, but also expensive and wasteful. New technology is being developed to completely change this process by designing and building parts from scratch through techniques such as 3D printing that will allow manufacturers to create high-quality, precision parts quickly and with little to no waste. As additive manufacturing, and specifically 3D printers, become cheaper to operate, it is likely that most households will soon have their own units and the ability to create their own spare parts and products!



ADVANCED ROBOTICS & SYSTEMS

Many manufacturing companies use some type of robotics for a wide range of production, assembly, and machining jobs, allowing them to perform duties or functions quicker, safer, and more efficiently. Additional work is currently underway to create new robotics to further assist human workers in the safe and accurate production of high-quality products around the world. Some of the proposed advances include the robot's ability to do more than one job, to be easily deployed for use outside the typical work environments, and to use advanced artificial intelligence for further adaptation, problem solving, and collaboration with human workers.



AUGMENTED REALITY (AR) AND VIRTUAL REALITY (VR)

Successful manufacturing companies must be able to safely and legally produce a high-quality product in a cost efficient manner that customers are willing to buy. Doing so often requires expensive and time consuming training, inspections, testing, and analysis of the various materials, facilities, and processes involved throughout the manufacturing process. New advances in technology allow many of these activities to occur in a virtual world, free from many of the dangers and limitations of the real world; or through an augmented view of the real world with assistive technology, such as glasses that presents holographic images of machine designs, instructions, measurements, temperatures, and even inventory levels that could severely cut down on manufacturing down times and costly errors.



FLEXIBLE SCHEDULING OPTIONS - THREE OR FOUR DAY WORK WEEKS AND BONUS PAY OPTIONS

An aspect of advanced manufacturing that many workers appreciate is the flexible and nontraditional scheduling options that are helpful to those with personal or professional responsibilities such as students, parents, and retired workers. Many modern manufacturing facilities run 24 hours a day, 7 days a week, 365 days a year. Some have even begun offering 10 or 12 hour shifts that allow employees to complete an entire week of work in three or four days, with the rest of the week off for relaxing, family time, or extended travel. Below are a few of the more common shifts in this field, but many employers are willing to work with employees on customized schedules.

Most employers also offer hard working and dedicated employees the opportunity to work overtime shifts to earn more money than a typical 40 hour work week. Workers can expect to earn their normal hourly wages plus an added bonus for overtime hours, often equating to time-and-a-half (i.e. \$20 per hour base + \$10 per hour bonus = \$30 per hour total). Additional incentives such as paid employee benefits, shift differential bonuses, tuition reimbursement, and profit sharing potential allow workers in this industry to make substantially more than some other industries.

Name	Hours
1st Shift	7 AM – 9 AM until 3 PM – 5 PM
2nd Shift	3 PM – 5 PM until 10 PM - 12 AM
3rd Shift	10 PM – 12 AM until 6 AM – 8 AM
4x10 *Four 10-hour days, three days off	6 AM – 8 AM until 4 PM – 6 PM
3x12 *Three 12-hour days, four days off	5 AM – 7 AM until 5 PM – 7 PM



FLEXIBLE TRAINING OPTIONS - REGISTERED APPRENTICESHIP PROGRAMS LET YOU EARN WHILE YOU LEARN!



Similar to scheduling and pay options, many employers offer additional training options to fit varying schedules, learning preferences, and career goals. While the most common, affordable, and direct approach to earning the necessary education to be successful in this industry is through one of Iowa's community colleges, most of the careers highlighted in this document have a corresponding Registered Apprenticeship option. This option offers hands-on training and related technical instruction (RTI) that allows Registered Apprentices to earn a paycheck from day one. Look for the Earn & Learn logo for a career that is apprenticeable. Visit EarnAndLearnIowa.gov to learn more about these great opportunities, view testimonials from real apprentices in Iowa, and fill out a form to be contacted by a representative from a local IowaWORKS field office for a direct conversation.

CAREER INTEREST TYPES - WHAT TYPE OF CAREER MATCHES YOUR PERSONALITY AND INTERESTS?

We are born with certain character traits, while some are developed as we grow and experience new things. There are many different tests or assessments available to help us determine what careers might match our personality or interests. The most common test includes six interest themes based on research by John Holland that can be taken for free at FutureReadyIowa.gov. These include the Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), and Conventional (C) groups, reflected in the diagram to the right.

After identifying the top three preferred interest areas, a user is left with an interest type, such as RIA, CES, or ECR. Occupations in this document have been labeled with these codes to help readers better understand potential matches for further research and investigation. Don't worry if a career doesn't match exactly to your code as this is not an exact science, but rather a starting point to help guide users in their career exploration process. There are careers for everyone in advanced manufacturing.



R

REALISTIC

You like to work with your hands and use physical skills including repairing and making things with tools and machines. You prefer working on projects you can see and feel, not what can be imagined or theorized.

I

INVESTIGATIVE

You tend to focus on ideas and enjoy collecting and analyzing information. You are curious and tend to prefer situations with minimal rules or regulations. You tend to like math and science.

A

ARTISTIC

You focus on artistic self-expression, value independence, and are not afraid to experiment with ideas. You enjoy variety and tend to feel cramped in structured situations. Creativity guides you.

S

SOCIAL

You are highly concerned with people, make friends easily, and are a good communicator. You enjoy working with others to identify and solve problems. You are helpful, friendly, and trustworthy.

E

ENTERPRISING

You are goal-oriented and often provide leadership and a high degree of energy when working with others. You tend to get bogged down by too much science, data, and analytical thinking. You are more comfortable selling and negotiating.

C

CONVENTIONAL

You pay close attention to detail and work well with numbers and data. You prefer following the rules and working with clear expectations.

ADVANCED MANUFACTURING OCCUPATION FAMILIES

Advanced manufacturing offers students and job seekers an opportunity to take an idea or vision and see it come to life for others to use and enjoy. Below are six general interrelated groups, or “families,” that follow the lifecycle of products from first concept to final sale. Although these groups do not contain all of the great opportunities in this industry, these are some with the highest demand or potential for growth within the state of Iowa. Which describes you best?



THE INNOVATORS ENGINEERING & BUSINESS OPERATIONS

[Common Interest Types: Investigative, Realistic, Conventional]

You can see the bigger picture! People present you with a problem, idea, or goal and you will find a way to get it done. Experimental theories and testing new ideas don't scare you. Problem solving and creative thinking are some of your finer traits. Your ideas and solutions lead the way!



THE CREATORS MACHINE OPERATIONS, PROGRAMMING, & WELDING

[Common Interest Types: Realistic, Conventional, Artistic]

You make things! Through a mixture of technology and ingenuity, you create the parts needed to build amazing products. You're comfortable working with a wide range of tools, from manual presses and lathes to innovative 3-D printers and computer-numerical controlled (CNC) machines.



THE FINISHERS PRODUCTION & ASSEMBLY

[Common Interest Types: Realistic, Conventional, Enterprising]

You complete things! You combine all the various parts and pieces to build something for people to use. You enjoy working with your hands to build and fix things, while your artistic mind and curiosity help guide you. Your products improve the lives of those in your community!



THE INSPECTORS QUALITY CONTROL & MAINTENANCE

[Common Interest Types: Conventional, Realistic, Investigative]

You have an eye for detail! People can rely on you to do something the right way and not cut corners. You are an imaginative and creative problem solver who isn't afraid to put in the time and effort to get something completed. Before products are sold, they need to be inspected and approved for safety and quality, sometimes making slight changes or tweaking machines to fix a problem. Perfection is your middle name!



THE TRANSPORTERS TRANSPORTATION & LOGISTICS

[Common Interest Types: Realistic, Conventional, Enterprising]

You connect the dots! You're not afraid of working with all the various departments, vendors, and suppliers to get a product made, packaged, and delivered quickly and efficiently. Your project management, organization, and communication skills are top notch!



THE NEGOTIATORS SALES & MARKETING

[Common Interest Types: Enterprising, Conventional, Social]

People like being around you! Your ease with communication and building relationships make you a great choice to inform, demonstrate, and sell products to the world. You identify a need and find a product to fill it, sometimes even feeding ideas about new or improved products back to the Engineering & Business Operations family. You have lots of charisma and charm!

USING THESE CAREER PATHWAYS

The information in these pathways is not intended to cover every occupation within the advanced manufacturing industry in Iowa. Rather, it is intended to provide the student, job-seeker, parent, educator, and others with a high-level view of common positions within each occupation family. Information has been averaged to help guide the reader in evaluating which of these jobs are of interest and worthy of further research through the online [Future Ready Iowa Career Coach](#) tool, which allows readers to customize labor, salary, education, and other information based on their specific location within the state. Additional recommendations for next steps and a career exploration action plan are included at the end of the document.

Occupations have been grouped into the following three levels based on factors such as typical education, experience, and wages. Many workers in this industry do not follow a direct pathway within the same occupation family, but rather enter and progress through a wide range of different careers from each family. Actual education requirements, job duties, and wage levels will vary from employer to employer around the state. Leadership and management opportunities are available in all families, but may not be reflected in these materials.

1. Entry Level: These positions are the best entry points for someone with little experience or education, as they typically require only a high school diploma or equivalent - HSED (occasionally a certification or technical training) and little to no prior related work experience. Many workers enter this industry through the Machine Operations, Programming, & Welding; Production & Assembly; and Transportation & Logistics families. Although these careers start with lower wages, they are often a great starting point with huge potential for promotion and advancement with hard work, dedication, and planning.

2. Mid-Level: These positions pay more than those at the entry level, but also often require some related work experience and additional education, such as a technical training/certificate, two-year associate's degree, or four-year bachelor's degree. This is generally the point where workers have identified a career they enjoy and begin fine-tuning their skills. Some experienced workers from other industries or students who have completed internships or apprenticeship training programs may be able to enter at this elevated level.

3. Senior Level: These positions are typically high-level management or specialized positions and require significant education, such as a four-year bachelor's degree or advanced graduate degree, in addition to leadership training and extensive experience in the industry. Learning a specific organization's history, culture, and values is also often important to lead at this level.





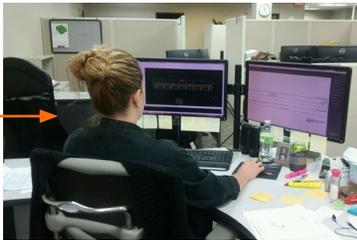
Occupations in the *Engineering & Business Operations* family are involved in the broad scope of the entire manufacturing process, helping companies to design and produce high-quality, innovative products in the most cost-efficient way.

Engineers are able to not only come up with big ideas, but also figure out how to accomplish them by combining ingenuity, hard work, and advanced technical abilities. Some engineering roles focus on the development and creation of cutting-edge parts or products, while others may focus on evaluating the manufacturing process to discover where corrections or improvements can be made to save time, money, and other resources.

Engineers and technicians play a vital role in the product research and development (R&D) process, determining how something should be designed or perform for a customer, and then testing and verifying it in a wide range of conditions and locations. This could include anything from wind turbine compressors hundreds of feet above the ground to tiny, complex medical devices in our bodies.

Business operations professionals ensure projects stay on time, under budget, and make customers happy. They work with engineers, sales representatives, and additional partners from the other occupation families to come up with the new, innovative products we use every day.

Due to the complex, technical, and analytical nature of the occupations in this family, a higher level of education and experience is often required than with the other families, typically an associate's degree or higher. Experience working in the other families is also often expected since responsibilities often involve collaborating with them during the product research, development, and modification process.



CAREER SPOTLIGHT:

Jacquelyn N. – Designer for Conductix Wampfler (Harlan, IA):

“Every day is a little different than the day before. I mainly work on engineering changes to parts or assemblies, updating models and drawings in SolidWorks. I also provide system layouts using AutoCAD. I work closely with our sales force determining the best solutions for each system and problem solving based on each customer’s system requirements and environment.”







COMPUTER-AIDED DESIGN (CAD) DRAFTER

ENTRY LEVEL

Typical Education/Training: Technical Certificate/Diploma

Work Experience: 0-3 years

Wage Range: \$18 - \$27/hour

Develop, review, and analyze detailed design drawings and specifications for mechanical equipment, dies, tools, and controls, using computer-aided design (CAD) equipment. Coordinate with and consult other workers to design, layout, or detail components and systems and to resolve design or other problems to ensure high levels of quality and safety.

Knowledge & Skills:

- 1) CAD or AutoCAD Software
- 2) Design and Drawing
- 3) Engineering Technology
- 4) Mathematics and Measuring
- 5) Analytical Thinking
- 6) Problem Solving



Similar Roles/Titles:

CAD Designer, CAD Drafter, Mechanical Drafter, Design Drafter, Drafting Technician

Career Interest Types:

RIA - Realistic, Investigative, Artistic

INDUSTRIAL ENGINEERING TECHNICIAN

ENTRY LEVEL

Typical Education/Training: Technical Certificate/Diploma

Work Experience: 0-3 years

Wage Range: \$20 - \$28/hour

Apply engineering theory and principles to problems of industrial layout or manufacturing production, usually under the direction of engineering staff. May perform time and motion research studies on worker operations to establish standard production rates or improve efficiency.

Knowledge & Skills:

- 1) Engineering and Technology
- 2) Production and Processing
- 3) Mathematics and Physics
- 4) Mechanical Tools & Equipment
- 5) Monitoring & Testing
- 6) Comprehend and Follow Instructions



Similar Roles/Titles:

Engineering Technician, Industrial Engineering Analyst, Manufacturing Technician, Process and Methods Analyst, Process Technician

Career Interest Types:

IRC - Investigative, Realistic, Conventional

INDUSTRIAL DESIGNER

ENTRY LEVEL

Typical Education/Training: Associate's Degree

Work Experience: 0-3 years

Wage Range: \$18 - \$30/hour

Prepare sketches of ideas, detailed drawings, or blueprints, using drafting instruments, art supplies, or computer-aided design (CAD) equipment. Consult with other departments and directly with customers to establish and evaluate design concepts for new and existing products. Test and modify designs to achieve customer specifications in a safe and efficient manner.

Knowledge & Skills:

- 1) CAD or AutoCAD Software
- 2) Computers and Technology
- 3) Design and Drawing
- 4) Manufacturing Processes
- 5) Model-building Equipment
- 6) Physics and Mathematics

Similar Roles/Titles:

Commercial Designer, Design Engineer, Mechanical Designer, Product Designer, Product Development Engineer

Career Interest Types:

AER - Artistic, Enterprising, Realistic

* Wage range is an average of entry level to experienced workers.



MATERIALS & PROCESS ENGINEER

MID LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 4-7 years

Wage Range: \$27 - \$39/hour

Research, design, develop, and test manufacturing systems and materials, working alongside other engineers, technicians, designers, and machinists on the production floor and in a laboratory. Prepare visual and written reports on project progress, including recommendations for cost or efficiency improvements.

Knowledge & Skills:

- 1) Analyze Test Results and Data
- 2) CAD or AutoCAD Software
- 3) Engineering and Technology
- 4) Manufacturing Systems
- 5) Mathematics and Physics
- 6) Mechanical Tools and Equipment



Similar Roles/Titles:

Materials & Process Analyst, Materials Development Engineer, Materials Research Engineer, Materials and Processes Manager, Research Engineer

Career Interest Types:

IRE - Investigative, Realistic, Enterprising

MECHANICAL ENGINEER

MID LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 4-7 years

Wage Range: \$26 - \$40/hour

Research, plan, and design tools, engines, machines, and other mechanically functioning equipment. Oversee installation, operation, maintenance, and repair of equipment throughout the manufacturing process based on factors like budget, efficiency, energy, time, and quality.

Knowledge & Skills:

- 1) Complex Problem Solving Skills
- 2) Engineering and Technology
- 3) Mechanical and Systems Analysis
- 4) Drafting and Design
- 5) CAD or AutoCAD Software
- 6) Mathematics and Physics



Similar Roles/Titles:

Mechanical Drafters, Mechatronics Engineer, Application Engineer, Equipment Engineer, Mechanical Design Engineer

Career Interest Types:

IRC - Investigative, Realistic, Conventional

INDUSTRIAL ENGINEER

MID LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 4-7 years

Wage Range: \$29 - \$40/hour

Research, draft, and design layouts of systems using drafting tools and computer software to ensure the manufacturing process is as efficient as possible. Implement quality control procedures, estimate production costs, and develop new or improved manufacturing methods.

Knowledge & Skills:

- 1) CAD or AutoCAD Software
- 2) Mathematics and Physics
- 3) Computers and Electronics
- 4) Manufacturing and Design Processes
- 5) Engineering and Technology
- 6) Mechanical and Systems Analysis



Similar Roles/Titles:

Manufacturing Engineer, Mechanical Engineering Technician, Commercial and Industrial Designer, Civil Engineer, Industrial Ecologist

Career Interest Types:

RIS - Realistic, Investigative, Social

* Wage range is an average of entry level to experienced workers.



CHEMICAL ENGINEER

MID LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 4-7 years

Wage Range: \$32 - \$47/hour

Research, design, and develop equipment and processes for manufacturing chemicals and products, such as synthetic rubber, plastics, food additives, and paper, by applying principles and technology of chemistry, physics, and engineering. Troubleshoot problems with chemical manufacturing processes, equipment, and finished products to optimize performance or to ensure compliance with safety and environmental regulations.

Knowledge & Skills:

- 1) Chemistry and Mathematics
- 2) Engineering and Technology
- 3) Complex Problem Solving
- 4) Research and Data Analysis
- 5) CAD or AutoCAD Software
- 6) Safety and Quality Control



Similar Roles/Titles:

Chemical Process Control, Chemical Development Engineer, Chemical Process Engineer, Research Engineer, Refinery Process Engineer

Career Interest Types:

IRE - Investigative, Realistic, Enterprising

ELECTRICAL ENGINEER

MID LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 4-7 years

Wage Range: \$31 - \$45/hour

Design, develop, and supervise the installation of electrical equipment, components, or systems. Consult with engineers, customers, or others to discuss existing or potential engineering projects or products. Test electrical equipment and components to ensure compliance with safety and environmental rules and regulations.

Knowledge & Skills:

- 1) CAD or AutoCAD Software
- 2) Administration and Management
- 3) Communication and Delegation
- 4) Advanced Computer Skills
- 5) Mathematics and Measuring
- 6) Critical Thinking and Problem Solving



Similar Roles/Titles:

Electrical Project Manager, Industrial Project Manager, Lean Manager, Account Manager, Technical Project Lead

Career Interest Types:

ECS - Enterprising, Conventional, Social

PROJECT MANAGER

MID LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 4-7 years

Wage Range: \$26 - \$41/hour

Consult and negotiate with internal and external customers to determine project details, budget, and deadlines. Coordinate projects and delegate tasks across various design, production, and marketing teams. Monitor, gather, and assess information for project status reports, ensuring compliance with regulations and keeping projects on time and within budget.

Knowledge & Skills:

- 1) CAD or AutoCAD Software
- 2) Mathematics and Problem Solving
- 3) Computers and Electronics
- 4) Manufacturing and Design Processes
- 5) Engineering and Technology
- 6) Mechanical, Data, and Systems Analysis

Similar Roles/Titles:

Project Lead, Project Engineer, Civil Engineer, Industrial Ecologist, Design Engineer

Career Interest Types:

RIC - Realistic, Investigative, Conventional

* Wage range is an average of entry level to experienced workers.



ENGINEERING MANAGER

SENIOR LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 8+ years

Wage Range: \$40 - \$62/hour

Build, supervise, and manage teams of engineering technologists, engineers, and other related professionals. Oversee the coordination and overall integration of technical activities in engineering projects. Consult with other departments and present proposals, reports, or findings to clients or upper management.

Knowledge & Skills:

- 1) Analyze Test Results and Data
- 2) Engineering and Technology
- 3) Administration and Management
- 4) Personnel and Human Resources
- 5) Mathematics and Physics
- 6) Communication and Coordination

Similar Roles/Titles:

Chief Engineer, Director of Engineering, Plant Engineer, Project Research Manager, President of Engineering

Career Interest Types:

ERI - Enterprising, Realistic, Investigative

DIRECTOR OF OPERATIONS

SENIOR LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 8+ years

Wage Range: \$33 - \$48/hour

Plan, direct, and coordinate the general operations of a manufacturing organization. Communicate policies, manage daily operations, review financial statements or performance data, and plan the use of materials and human resources to keep operations running smoothly and profitable.

Knowledge & Skills:

- 1) Management and Leadership
- 2) Critical Thinking and Problem Solving
- 3) Data and Systems Analysis
- 4) Manufacturing and Production Processes
- 5) Safety Regulations and Procedures
- 6) Customer and Personal Service

Similar Roles/Titles:

Business Manager, Facility Manager, Operations Manager, Plant Manager, Plant Superintendent

Career Interest Types:

ECS - Enterprising, Conventional, Social

* Wage range is an average of entry level to experienced workers.



Occupations in the *Machine Operations, Programming, & Welding* family combine the knowledge of machining and computers to create the parts and pieces necessary to build products in a wide range of industries from household items to space shuttles.

Positions in this family manually set-up, program, and operate a variety of precision machines such as lathes, milling machines, drills, and grinders to fabricate precision parts. Many modern manufacturers also now use advanced technology like robotics, Computer Numerical Controlled (CNC) machines, or additive manufacturing technologies, such as 3D printers, to create unique and complex parts that have not been possible or too expensive to create on a large scale.

Welders specialize in connecting and repairing different types of metals with a wide range of tools, robotics, materials, and work environments, sometimes even under water or in other extreme outdoor conditions. Welding allows employees to blend their desire to build something with an artistic flare.

Most occupations in this family are trained with on-the-job programs or through apprenticeships, but some earn technical certificates or associate's degrees through community colleges and technical schools. If you find yourself wondering how things work and like to see and feel what you have created, these positions are a great career choice for you.

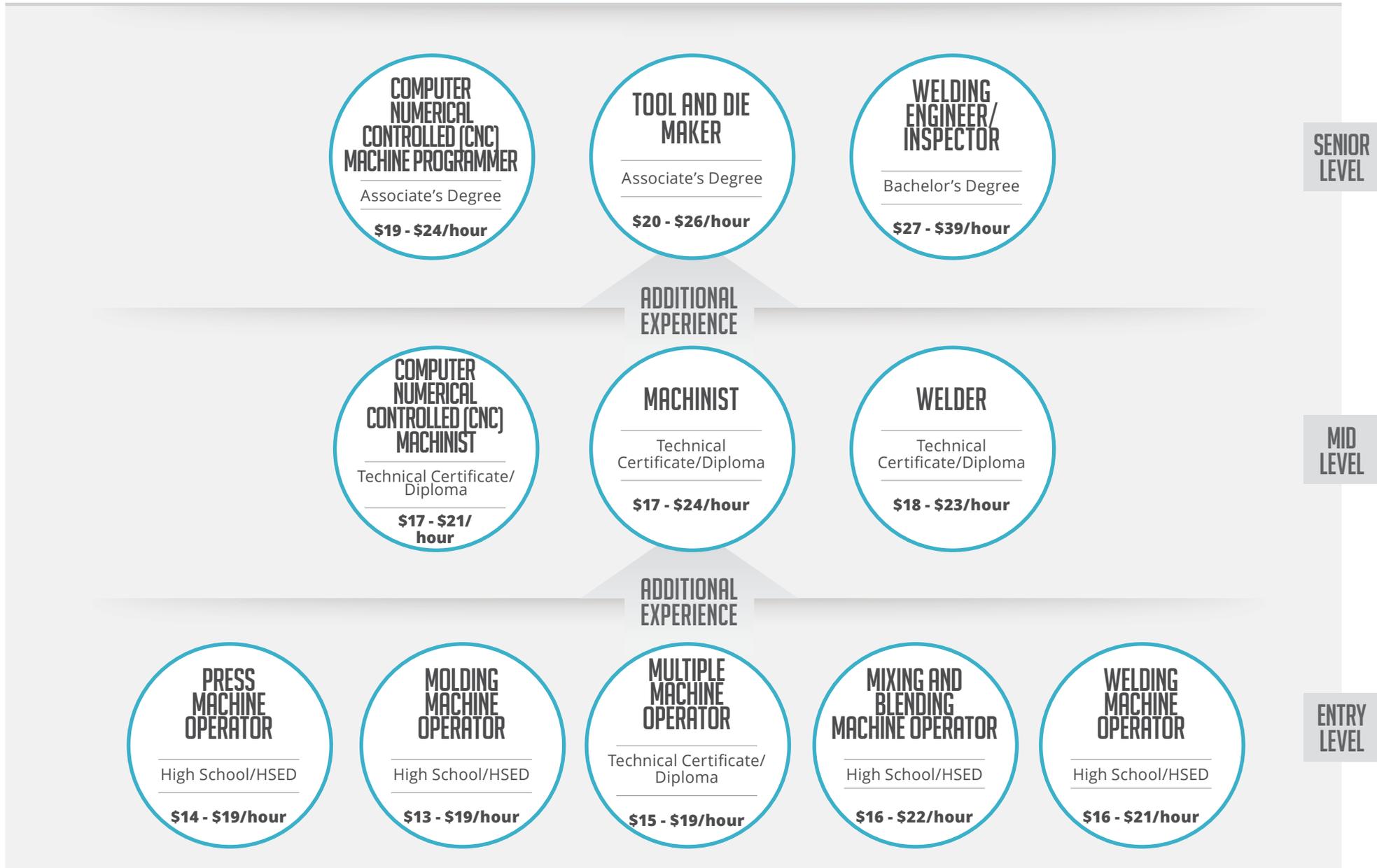


CAREER SPOTLIGHT:

Matt K. – Welder for Henderson Products (Manchester, IA)

“I started working at Henderson as a welder on the dump body line. With some additional Weld Automation training, I began working with a robotic welder. Working with the robotic welder is a very challenging and rewarding career. In order for the robot to work properly, everything has to fall in place and be done correctly. I have to make sure all the parts are loaded correctly, the weld program has all the correct positions, and that all of my weld settings are correct. By doing all of this successfully, I get to see a high quality plow weldment come out of the robot in a fraction of the time compared to manual welding.”







WELDING MACHINE OPERATOR

ENTRY LEVEL

Typical Education/Training: High School Diploma/HSED

Work Experience: 0-3 years

Wage Range: \$16 - \$21/hour

Set up, operate, and maintain machines or robots that weld, braze, solder, or heat treat metal products, components, or assemblies. Inspect workspace, equipment, and finished work to ensure high levels of quality and safety at all times.

Knowledge & Skills:

- 1) Attention to Detail
- 2) Production and Operation Monitoring
- 3) Mathematics & Metal Working Basics
- 4) Read and Follow Directions
- 5) Safety and Quality Control
- 6) Critical Thinking



Similar Roles/Titles:

Technical Associate (TA), Braze Operator, Finishing Technician, Fitter-Welder, Robotics Operator

Career Interest Types:

RCA - Realistic, Conventional, Artistic

MIXING & BLENDING MACHINE OPERATOR

ENTRY LEVEL

Typical Education/Training: High School Diploma/HSED

Work Experience: 0-3 years

Wage Range: \$16 - \$22/hour

Set up, operate, and maintain machines that mix or blend various dry or wet materials and ingredients together to create foods, drugs, chemicals, explosives, and other products. Read technical drawings, load raw materials into machinery, and use additional hand or power tools to keep machines running smoothly and safely.

Knowledge & Skills:

- 1) Attention to Detail
- 2) Comprehend and Follow Instructions
- 3) Machine Operation and Maintenance
- 4) Critical Thinking and Problem Solving
- 5) Mathematics and Measuring
- 6) Safety and Quality Control



Similar Roles/Titles:

Blending Technician, Mixer Operator, Stock Preparation Operator, Mixing Technician, Batch Maker

Career Interest Types:

RCE - Realistic, Conventional, Enterprising

MULTIPLE MACHINE OPERATOR

ENTRY LEVEL

Typical Education/Training: Technical Certificate/Diploma

Work Experience: 0-3 years

Wage Range: \$15 - \$19/hour

Set up, operate, and maintain different types of cutting, rolling, forming, and manufacturing machine tools or robots as part of or in addition to an assembly or production line. Make minor adjustments or repairs as necessary to maintain a high level of quality and safety while keeping machinery running smoothly and on schedule.

Knowledge & Skills:

- 1) Attention to Detail
- 2) Problem Solving Skills
- 3) Comprehend and Follow Instructions
- 4) Equipment Maintenance
- 5) Monitor Machine Operation
- 6) Safety and Quality Control



Similar Roles/Titles:

Machine Operator, Equipment Operator, Machine Technician, Machine Tool Setter, Set-Up Person

Career Interest Types:

RCE - Realistic, Conventional, Enterprising

* Wage range is an average of entry level to experienced workers.



MOLDING MACHINE OPERATOR

ENTRY LEVEL

Typical Education/Training: High School Diploma/HSED

Work Experience: 0-3 years

Wage Range: \$13 - \$19/hour

Set-up, operate, and maintain machinery that creates and fills molds for various plastic and metal manufactured parts to be used to create or finish products. Load materials and monitor machines, making minor modifications or adjustments when necessary to maintain a high level of accuracy, quality, and safety.

Knowledge & Skills:

- 1) Comprehend and Follow Instructions
- 2) Machine and Operation Monitoring
- 3) Attention to Detail
- 4) Advanced Computer Skills
- 5) Equipment Maintenance
- 6) Safety and Quality Control



Similar Roles/Titles:

Mold Mechanic, Molding Technician, Mold Setter, Molder, Machine Operator

Career Interest Types:

RCI - Realistic, Conventional, Investigative

PRESS MACHINE OPERATOR

ENTRY LEVEL

Typical Education/Training: High School Diploma/HSED

Work Experience: 0-3 years

Wage Range: \$14 - \$19/hour

Set up, operate, and maintain machines that press, bend, or otherwise shape raw materials into usable parts and finished or printed products. Monitor machine operation for errors or problems with safety and quality of products, filing reports, and making corrections when necessary to resolve.

Knowledge & Skills:

- 1) Comprehend and Follow Instructions
- 2) Operation Monitoring
- 3) Attention to Detail
- 4) Advanced Computer Skills
- 5) Problem Solving and Repair
- 6) Safety and Quality Control



Similar Roles/Titles:

Metal Machine Operator, Production Operator, Extrusion Operator, Press Machinist, Printing Press Operator

Career Interest Types:

RCI - Realistic, Conventional, Investigative

COMPUTER-NUMERICAL CONTROLLED (CNC) MACHINIST

MID LEVEL

Typical Education/Training: Technical Certificate/Diploma

Work Experience: 4-7 years

Wage Range: \$17 - \$21/hour

Set up, operate, and monitor computer-numerical controlled (CNC) machines or robots to create or customize precision metal and plastic parts for use in the final assembly of products. Using technical drawings and readings from various gauges and monitors, make adjustments to maintain a high level of quality, safety, and precision at all times.

Knowledge & Skills:

- 1) Attention to Detail and Analytical Thinking
- 2) Information Gathering and Monitoring
- 3) Safety and Quality Control
- 4) Making Decisions and Problem Solving
- 5) Reading Technical Drawings and Prints
- 6) Advanced Computers and Software



Similar Roles/Titles:

CNC Machine Tool Operator, CNC Machine Operator, CNC Operations Technician, CNC Operators, CNC Mill Operator

Career Interest Types:

RCI - Realistic, Conventional, Investigative

* Wage range is an average of entry level to experienced workers.



MACHINIST

MID LEVEL

Typical Education/Training: Technical Certificate/Diploma

Work Experience: 4-7 years

Wage Range: \$17 - \$24/hour

Set up, operate, and maintain a variety of complex machines and tools to produce or modify precision parts and instruments that supply the necessary materials to create or finish high quality products. Monitor the performance of machines and make safety or quality control adjustments when necessary.

Knowledge & Skills:

- 1) Dimension and Tolerance Calculation
- 2) Machine Monitoring and Control
- 3) Mathematics and Measuring
- 4) Attention to Detail
- 5) Production and Processing
- 6) Safety and Quality Control



Similar Roles/Titles:

Precision Machinist, Journeyman Machinist, Maintenance Machinist, Production Machinist, Set-Up Machinist

Career Interest Types:

RCI - Realistic, Conventional, Investigative

WELDER

MID LEVEL

Typical Education/Training: Technical Certificate/Diploma

Work Experience: 4-7 years

Wage Range: \$18 - \$23/hour

Use various hand-welding or flame-cutting equipment to weld or join metal parts or to fill holes, indentations, and seams of metal products. Inspect workspace, equipment, and finished work to ensure high levels of quality and safety at all times.

Knowledge & Skills:

- 1) Welding and Metal Working Certificate
- 2) Critical Thinking Skills
- 3) Ignite and Use Torches
- 4) Precise Hand/Eye Coordination
- 5) Attention to Detail
- 6) Safety and Quality Control



Similar Roles/Titles:

Production Welder, Welding Technician, Manufacturing Welding Technician, Brazer/Solderer, MIG Welder

Career Interest Types:

RCA - Realistic, Conventional, Artistic

COMPUTER NUMERICAL CONTROLLED (CNC) MACHINE PROGRAMMER

SENIOR LEVEL

Typical Education/Training: Associate's Degree

Work Experience: 8+ years

Wage Range: \$19 - \$24/hour

Design, develop, or modify computer programs to communicate with automatic machine tools, equipment, or systems, such as Computer-Aided Design (CAD) and Computer-Aided Manufacturing (CAM) software. Direct or assist other machinists, technicians, and assemblers in the set-up and operation of complex computer-controlled machines and robots.

Knowledge & Skills:

- 1) Reading Technical Drawings and Prints
- 2) Mathematics, Physics, and Measuring
- 3) Design and Drafting Programs (CAD/CAM)
- 4) Operational Sequences and Monitoring
- 5) Revising and Retesting Programs
- 6) Manufacturing Processes and Systems



Similar Roles/Titles:

Machine Tool Programmer, CNC Programmer, Integrated Machinist Programmer, CAD/CAM Programmer, Machining Manager

Career Interest Types:

CIA - Conventional, Investigative, Artistic

* Wage range is an average of entry level to experienced workers.



TOOL & DIE MAKER

SENIOR LEVEL

Typical Education/Training: Associate's Degree

Work Experience: 8+ years

Wage Range: \$20 - \$26/hour

Analyze specifications, lay out materials, operate machines, and fit or assemble parts to make and repair dies, cutting tools, fixtures, gauges, and other machinist tools to be used in the manufacturing process. Inspect finished products and make modifications to machines manually or through computer-numerically controlled (CNC) software.

Knowledge & Skills:

- 1) Attention to Detail
- 2) Comprehend and Follow Instructions
- 3) Metal Types and Properties
- 4) Safety and Quality Control
- 5) Computers and Software
- 6) Inspection and Repair



Similar Roles/Titles:

Die Maker, Tool Maker, Tool & Die Machinist, Tool Repairer, Jig and Fixture Repairer

Career Interest Types:

RIC - Realistic, Investigative, Conventional

WELDING ENGINEER/INSPECTOR

SENIOR LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 8+ years

Wage Range: \$27 - \$39/hour

Research, design, develop, and test welding systems and materials with advanced training in physics, chemistry, electricity, and photonics. Direct the operations of welders and machine operators associated with weldments and other types of applied joints before, during, and after the product process in accordance with contracts, codes, and other quality and safety standards.

Knowledge & Skills:

- 1) Management and Leadership
- 2) Manufacturing Process and Systems
- 3) Welding Tools, Materials, and Equipment
- 4) Safety and Quality Control
- 5) Communication and Coordination
- 6) Mathematics, Chemistry, and Physics

Similar Roles/Titles:

Welding Lead, Director of Welding, Welding Supervisor, Welding Manager, Journeyman Welder

Career Interest Types:

RIE - Realistic, Investigative, Enterprising

* Wage range is an average of entry level to experienced workers.



Occupations in the *Production & Assembly* family are responsible for the creation, modification, and alignment of parts or components to finish the assembly of a variety of products - ranging from your favorite prepackaged food products to self-driving cars!

Production and assembly workers usually finish parts and then join them together to build products like electronics, frozen meals, and household appliances. Some workers specialize in a particular part, such as high-pressure valves and air fresheners, or a type of product, such as cranes and aircraft.

Important components of this occupation can be starting, operating, cleaning, and maintaining machines or equipment, in addition to assembling the finished product. Troubleshooting and problem solving skills are necessary to ensure the production line runs smoothly and high-quality products are made in a safe manner.

This career is ideal for individuals who are mechanically minded, creative, and want to be a part of something bigger. Many of the entry-level careers require a high school diploma or equivalent and offer a lot of potential for advancement. Many employers offer tuition reimbursement or their own training programs to help workers gain any additional skills, knowledge, or abilities needed to take those next steps towards a long-term career with their companies.

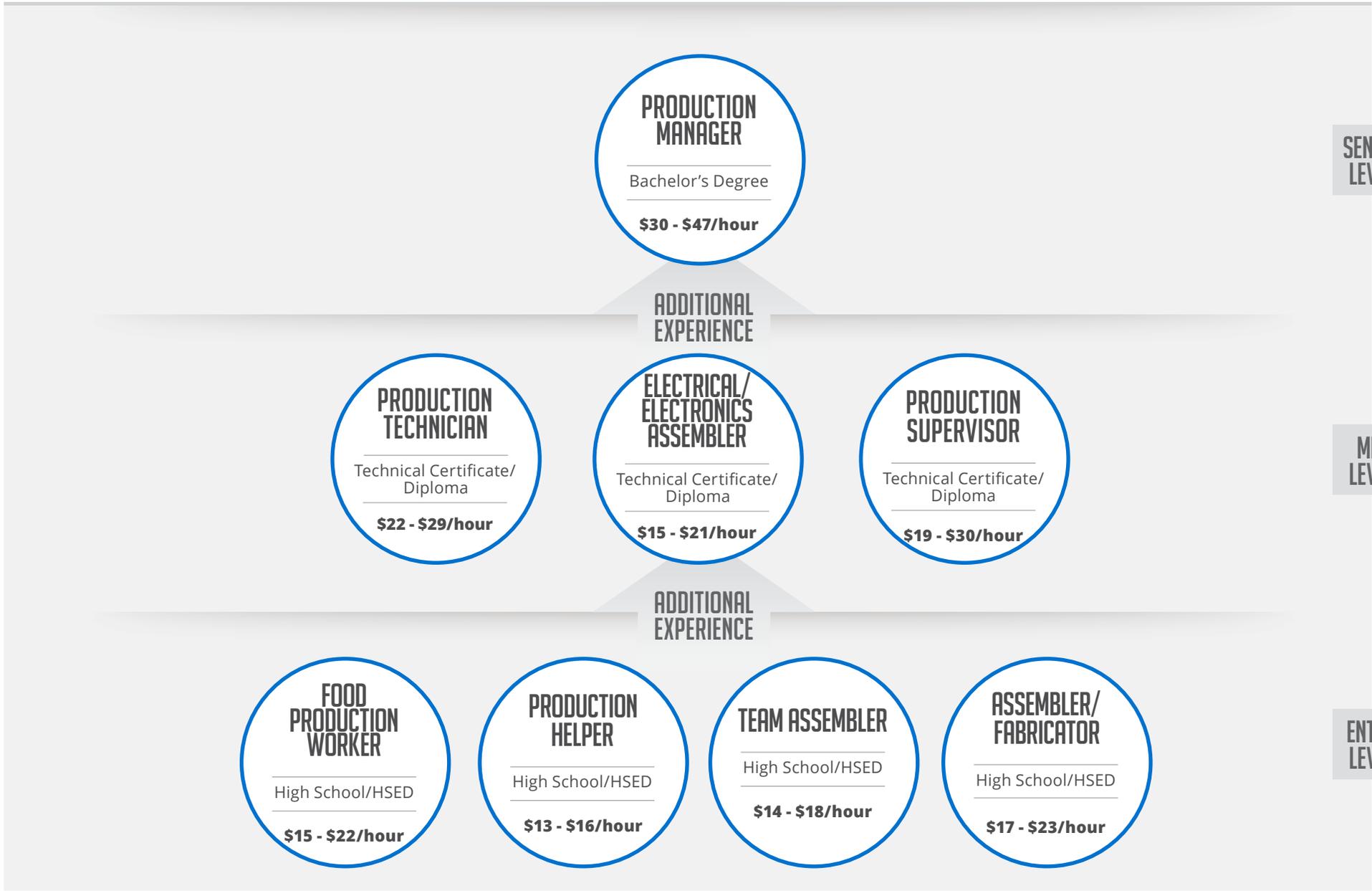


CAREER SPOTLIGHT:

Jason B. – RFID Production Technician for Metalcraft, Inc. (Mason City, IA)

“I had recently graduated from the University of Northern Iowa and had a few friends that worked at Metalcraft who thought I might like the work. I’d never worked in advanced manufacturing before, so wasn’t sure what to expect. I now get to work on a specialized machine called the Viper that makes RFID (Radio-Frequency Identification) smart label products. I enjoy the problem solving and challenge of figuring out how to run new orders to meet the needs of our customers. Every day brings something different!”







TEAM ASSEMBLER

ENTRY LEVEL

Typical Education/Training: High School Diploma/HSED

Work Experience: 0-3 years

Wage Range: \$14 - \$18/hour

Work as part of a team to assemble an entire product or components to be used to finish a product. Move between various roles or positions on an assembly line to keep production running smoothly, quickly, and efficiently. Identify and take action to resolve machine down times and production delays.

Knowledge & Skills:

- 1) Critical Thinking and Decision Making
- 2) Working as a Team
- 3) Design and Manufacturing Processes
- 4) Production and Processing
- 5) Safety and Quality Control
- 6) Attention to Detail



Similar Roles/Titles:

Assembly Line Worker, Product Assembler, Assembly Technician, Skilled Production Assembly, Production Worker

Career Interest Types:

RCE - Realistic, Conventional, Enterprising

ASSEMBLER/FABRICATOR

ENTRY LEVEL

Typical Education/Training: High School Diploma/HSED

Work Experience: 0-3 years

Wage Range: \$17 - \$23/hour

Independently construct, assemble, or rebuild an entire product or components to be used to finish a product. Identify and take action to resolve machine or equipment down times and other causes for production delays. Inspect, operate, and test completed products to verify functioning, machine capabilities, or conformance to customer specifications.

Knowledge & Skills:

- 1) Critical Thinking and Decision Making
- 2) Mechanical Tools and Equipment
- 3) Design and Manufacturing Processes
- 4) Production and Processing
- 5) Safety and Quality Control
- 6) Attention to Detail



Similar Roles/Titles:

Fabrication and Assembly Technician, Mechanical Assembler, Product Assembler, Independent Assembler, Production Worker

Career Interest Types:

RCI - Realistic, Conventional, Investigative

PRODUCTION HELPER

ENTRY LEVEL

Typical Education/Training: High School Diploma/HSED

Work Experience: 0-3 years

Wage Range: \$13 - \$16/hour

Assists assemblers, fabricators, and machinists working on a wide assortment of machines and assembly lines with loading materials, setting-up machines, and testing or making adjustments to maintain a high level of safety and quality for finished food and non-food products.

Knowledge & Skills:

- 1) Comprehend and Follow Instructions
- 2) Production and Manufacturing Process
- 3) Working as a Team
- 4) Mechanical Tools and Equipment
- 5) Operation Monitoring
- 6) Attention to Detail



Similar Roles/Titles:

Production Worker, Assistant Operator, Assembly Helper, Material Handler, Support Team Member

Career Interest Types:

RCS - Realistic, Conventional, Social

* Wage range is an average of entry level to experienced workers.



FOOD PRODUCTION WORKER

ENTRY LEVEL

Typical Education/Training: High School Diploma/HSED

Work Experience: 0-3 years

Wage Range: \$15 - \$22/hour

Set up, operate, and monitor equipment that cuts, trims, mixes, or blends ingredients used in the manufacturing of a wide range of food and meat products. May include using hand tools and instruments to inspect and modify finished products before being wrapped or packaged for final sale.

Knowledge & Skills:

- 1) Comprehend and Follow Instructions
- 2) Production and Manufacturing Process
- 3) Mathematics and Measurements
- 4) Mechanical Tools and Equipment
- 5) Food Safety
- 6) Attention to Detail



Similar Roles/Titles:

Food Batch Maker, Food and Meat Trimmer, Food and Meat Processer, Processing Operator, Batching Operator

Career Interest Types:

RCE - Realistic, Conventional, Enterprising

ELECTRICAL & ELECTRONICS ASSEMBLER

MID LEVEL

Typical Education/Training: Technical Certificate/Diploma

Work Experience: 4-7 years

Wage Range: \$15 - \$21/hour

Assemble or modify electrical or electronic equipment, such as computers, electric motors, and HVAC systems, or components for use in finished products, such as circuitry and wiring harnesses. Use technical drawings and schematics to run wires, solder, inspect, and test electrical components and finished products.

Knowledge & Skills:

- 1) Comprehend and Follow Instructions
- 2) Electronics and Electrical Systems
- 3) Judgment and Decision Making
- 4) Mechanical Tools & Equipment
- 5) Analytical Thinking and Problem Solving
- 6) Electrical Testing Equipment



Similar Roles/Titles:

Electrical Equipment Assembler, Manufacturing Assembler, Electronics Fabricator, Factory Assembler, Electrical Production Worker

Career Interest Types:

RCI - Realistic, Conventional, Investigative

PRODUCTION TECHNICIAN

MID LEVEL

Typical Education/Training: Technical Certificate/Diploma

Work Experience: 4-7 years

Wage Range: \$22 - \$29/hour

Set-up, test, and adjust manufacturing machinery or equipment with electrical, mechanical, hydraulic, pneumatic, or computer technologies to keep production running safely, smoothly, and efficiently. Assist assemblers and fabricators with diagnosing and correcting issues impacting the quantity and quality of finished products.

Knowledge & Skills:

- 1) Computers and Electronics
- 2) Engineering and Technology
- 3) Production and Manufacturing Process
- 4) Critical Thinking
- 5) Mechanical Tools and Equipment
- 6) Quality and Safety Control



Similar Roles/Titles:

Manufacturing Technician, Engineering Technician, Manufacturing Production Technician, Support Technician, Operations Technician

Career Interest Types:

RIE - Realistic, Investigative, Enterprising

* Wage range is an average of entry level to experienced workers.



PRODUCTION SUPERVISOR

MID LEVEL

Typical Education/Training: Technical Certificate/Diploma

Work Experience: 4-7 years

Wage Range: \$19 - \$30/hour

Directly supervise and coordinate the activities of production workers on the assembly line, such as machine setters, operators, fabricators, and assemblers, to keep production running smoothly, quickly, and efficiently. Inspect and test completed work to ensure high levels of quality and safety before final sale.

Knowledge & Skills:

- 1) Analyze Numerical and Visual Test Results
- 2) Critical Thinking and Problem Solving
- 3) Comprehend and Deliver Instructions
- 4) Management and Leadership
- 5) Production Processes and Systems
- 6) Safety and Quality Control

Similar Roles/Titles:

Front Line Supervisor, Foreman, Assembly Supervisor, Production Lead, Shift Supervisor

Career Interest Types:

ERC - Enterprising, Realistic, Conventional

PRODUCTION MANAGER

SENIOR LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 8+ years

Wage Range: \$30 - \$47/hour

Plan, direct, and coordinate the work activities and resources necessary for manufacturing products in accordance with cost, quality, safety, and quantity specifications. Work with other department leaders to periodically review and make modifications to ensure that the manufacturing process is as efficient and effective as possible at all times.

Knowledge & Skills:

- 1) Budgeting and Financial Forecasting
- 2) Management and Leadership
- 3) Manufacturing Process and Systems
- 4) Mechanical Tools and Equipment
- 5) Safety and Quality Control
- 6) Communication and Coordination

Similar Roles/Titles:

Industrial Production Manager, Manufacturing Coordinator, Manufacturing Supervisor, Head of Production, Plant Manager

Career Interest Types:

ECS - Enterprising, Conventional, Social

* Wage range is an average of entry level to experienced workers.



Nearly everything in modern manufacturing involves a series of interconnected computers, systems, or electronic circuitry. Occupations in the *Quality Control & Maintenance* family are responsible for ensuring these complex operations continue to run smoothly and produce a consistently high-quality and safe product that people want to buy.

As manufacturers continue to add more high-tech equipment, they will need more highly-skilled maintenance workers and technicians who can install, inspect, and keep these advanced systems operating efficiently. Computers, software, and even augmented or virtual reality technologies are often used to help inspect and diagnose issues with equipment and products. Malfunctioning or improperly maintained machines are not only dangerous, they also threaten the overall success and well-being of the company.

If you love working with your hands, investigating problems, and fixing things, these positions could be a perfect match for you! Sharp observation, attention to detail, and communication skills are important to clearly describe findings and to work with other departments to find and correct the problem.

Due to continual advances in technology, a basic understanding of both mechanical and electronic principles is ideal for individuals in these roles. While education requirements will vary by employer, technical training above high school or participating in a work-based learning program, such as an apprenticeship, is highly recommended for this career path.

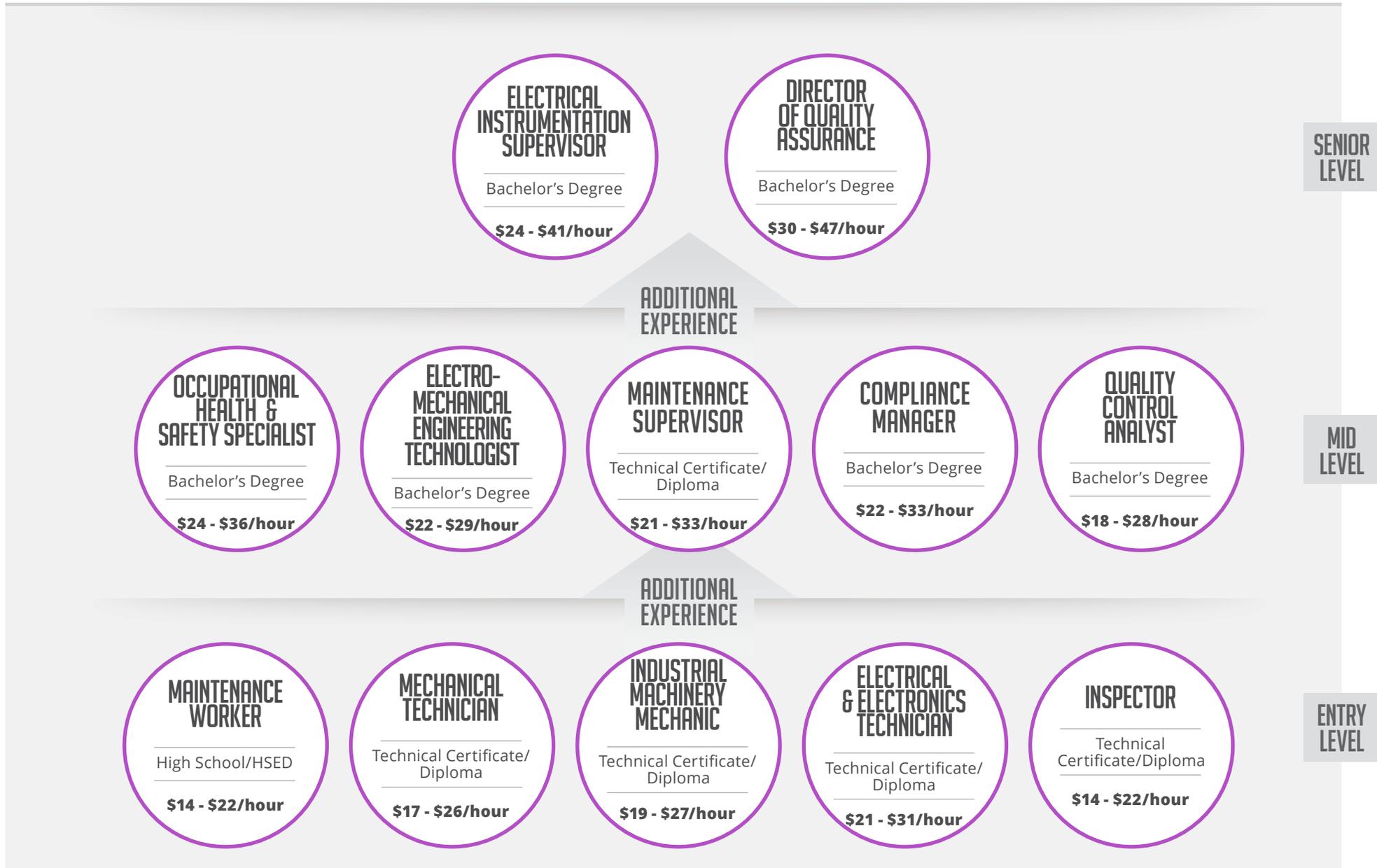


CAREER SPOTLIGHT:

Kelly M. - Manufacturing Engineering Technician, Quality Control, Underground for Vermeer (Pella, IA)

“As a Manufacturing Engineering Tech in Quality Control for our Underground division, I support lean manufacturing and continuous improvement efforts within the plant to improve safety and productivity. It is a great feeling knowing that we are putting out the best machine possible so our customers can get to work. It also gives you a sense of pride.”







INSPECTOR

ENTRY LEVEL

Typical Education/Training: Technical Certificate/Diploma

Work Experience: 0-3 years

Wage Range: \$14 - \$22/hour

Inspect, sample, test, and grade parts and products for defects, wear, and other differences from specifications. May use precision measuring instruments and complex test equipment in a lab, on the production floor, or other external job sites.

Knowledge & Skills:

- 1) Attention to Detail and Monitoring
- 2) Analytical or Scientific Software
- 3) Comprehend and Follow Instructions
- 4) Mathematics and Measuring
- 5) Quality Control Analysis
- 6) Critical Thinking and Problem Solving



Similar Roles/Titles:

Quality Assurance Auditor, Quality Assurance Technician, Quality Control Technician, Quality Inspector, Quality Technician

Career Interest Types:

CRI - Conventional, Realistic, Investigative

INDUSTRIAL MACHINERY MECHANIC

ENTRY LEVEL

Typical Education/Training: Technical Certificate/Diploma

Work Experience: 0-3 years

Wage Range: \$19 - \$27/hour

Install, adjust, and maintain industrial production and processing machinery. Analyze test results, error messages, and information from operators to diagnose and repair equipment problems. Inspect, operate, and test newly repaired machinery or equipment to verify operation and safety.

Knowledge & Skills:

- 1) Mechanical Tools, Equipment, & Systems
- 2) Production and Precision Processing
- 3) Critical Thinking and Problem Solving
- 4) Safety and Quality Control
- 5) Mathematics and Measuring
- 6) Maintenance and Repair



Similar Roles/Titles:

Industrial Mechanic, Machine Adjuster, Maintenance Mechanic, Master Mechanic, Machine Overhauler

Career Interest Types:

RIC - Realistic, Investigative, Conventional

ELECTRICAL & ELECTRONICS TECHNICIAN

ENTRY LEVEL

Typical Education/Training: Technical Certificate/Diploma

Work Experience: 0-3 years

Wage Range: \$21 - \$31/hour

Diagnose, troubleshoot, and repair electrical and electronic components, parts, equipment, and systems, usually under the supervision of engineers or technologists. Study diagrams, read gauges, take measurements, and make adjustments to keep electronics and electrical equipment running smoothly and efficiently.

Knowledge & Skills:

- 1) Analyze Numerical & Visual Test Results
- 2) Comprehend and Follow Instructions
- 3) Mathematics and Measuring
- 4) Electrical Systems and Manufacturing
- 5) Mechanical Tools and Equipment
- 6) Safety Regulations and Procedures



Similar Roles/Titles:

Electronics Engineering Technician, Electrical Engineering Technician, Instrument and Controls Tech, Failure Analysis Technician, Test Technician

Career Interest Types:

RIC - Realistic, Investigative, Conventional

* Wage range is an average of entry level to experienced workers.



MAINTENANCE WORKER

ENTRY LEVEL

Typical Education/Training: High School Diploma/HSED

Work Experience: 0-3 years

Wage Range: \$14 - \$22/hour

Keep machines, mechanical equipment, facilities, or building grounds repaired and in working order. Diagnose mechanical, structural, or safety problems and determine how to correct them by checking blueprints, repair manuals, technical journals, or parts catalogs.

Knowledge & Skills:

- 1) Building Maintenance and Construction
- 2) Comprehend and Follow Instructions
- 3) Install and Dismantle Equipment
- 4) Mechanical Tools and Machines
- 5) Machine Maintenance and Repair
- 6) Safety Regulations and Procedures



Similar Roles/Titles:

Repair Technician, Maintenance Team, Maintenance Technician, Facilities Manager, Maintenance Mechanic

Career Interest Types:

RCI - Realistic, Conventional, Investigative

MECHANICAL TECHNICIAN

ENTRY LEVEL

Typical Education/Training: Technical Certificate/Diploma

Work Experience: 0-3 years

Wage Range: \$17 - \$26/hour

Modify, develop, test, and calibrate machinery and equipment, generally under the direction of engineering staff or physical scientists. Read dials, meters, and test sample data to determine safe and efficient operating performance of machinery and equipment throughout the manufacturing process.

Knowledge & Skills:

- 1) Comprehend and Follow Instructions
- 2) Attention to Detail
- 3) Safety Regulations and Procedures
- 4) Critical Thinking Skills
- 5) Engineering and Technology
- 6) Mechanical Tools, Equipment, & Systems



Similar Roles/Titles:

Mechanical Engineering Technician, Mechanical Designer, Engineering Lab Technician, Engineering Technical Analyst, Engineering Technician

Career Interest Types:

CIR - Conventional, Investigative, Realistic

QUALITY CONTROL ANALYST

MID LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 4-7 years

Wage Range: \$18 - \$28/hour

Review, evaluate and recommend changes to products or processes in order to achieve a high level of product quality and safety. Conduct routine and on-the-spot analysis of raw materials, environmental samples, and finished goods. Interpret and compare test results to established specifications and control limits.

Knowledge & Skills:

- 1) Inspection and Data Analysis
- 2) Mathematics and Measuring
- 3) Critical Thinking and Problem Solving
- 4) Advanced Computer Skills
- 5) Reading Technical Documents and Prints
- 6) Safety and Quality Control



Similar Roles/Titles:

Lab Analyst, Lab Technician, Quality Assurance Technician, Quality Assurance Analyst, Quality Control Technician

Career Interest Types:

CIR - Conventional, Investigative, Realistic

* Wage range is an average of entry level to experienced workers.



OCCUPATIONAL HEALTH & SAFETY SPECIALIST

MID LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 4-7 years

Wage Range: \$24 - \$36/hour

Review and evaluate work environments for health and safety concerns. Make recommendations and design programs or procedures to help protect workers from potentially hazardous chemical, physical, and environmental factors. May conduct inspections and enforce laws and regulations governing the health and safety of all employees within a manufacturing site or facility.

Knowledge & Skills:

- 1) Health and Safety Regulations
- 2) Customer and Personal Service
- 3) Critical Thinking and Problem Solving
- 4) Active Listening and Questioning
- 5) Mathematics, Physics, and Measuring
- 6) Inspection and Data Analysis

Similar Roles/Titles:

Safety Officer, Environmental, Health, and Safety (EHS) Officer, Health and Safety Manager, Safety Consultant, Health & Safety Technician

Career Interest Types:

ICR - Investigative, Conventional, Realistic

COMPLIANCE MANAGER

MID LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 4-7 years

Wage Range: \$22 - \$33/hour

Plan, direct, and coordinate systems or policies to monitor the quality of a manufacturing or production system and the products it makes. Inspect, collect, and analyze production samples to evaluate the quality of products on the production floor and in a lab, communicating results and recommendations to upper management.

Knowledge & Skills:

- 1) Analyze Test Results and Data
- 2) CAD or AutoCAD Software
- 3) Engineering and Technology
- 4) Mathematics and Measuring
- 5) Quality and Safety Control
- 6) Manufacturing Process and Systems

Similar Roles/Titles:

Associate Director of QA, Lab Manager, Quality Assurance Manager, Quality Control Supervisor, Quality Engineer

Career Interest Types:

ECR - Enterprising, Conventional, Realistic

ELECTROMECHANICAL ENGINEERING TECHNOLOGIST

MID LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 4-7 years

Wage Range: \$22 - \$29/hour

Work with engineers, machinists, designers, and drafters to design products and create manufacturing systems that meet customer specifications. Troubleshoot issues in the manufacturing process and perform the right repairs, making sure that machinery and equipment runs smoothly and efficiently.

Knowledge & Skills:

- 1) CAD or AutoCAD Software
- 2) Mathematics and Measuring
- 3) Computer and Electrical Systems
- 4) Critical Thinking and Mathematics
- 5) Engineering and Technology
- 6) Mechanical Tools and Equipment



Similar Roles/Titles:

Electrical-Mechanical Technician, Mechanical Engineering Technician, Engineering Specialist, Engineering Tech, Mechanical Designer

Career Interest Types:

RCI - Realistic, Conventional, Investigative

* Wage range is an average of entry level to experienced workers.



MAINTENANCE SUPERVISOR

MID LEVEL

Typical Education/Training: Technical Certificate/Diploma

Work Experience: 4-7 years

Wage Range: \$21 - \$33/hour

Directly supervise and coordinate the activities of mechanics, techs, installers, and repairers of manufacturing equipment and facilities. Plan, lead, and teach members of the maintenance team regarding new equipment or safety and regulatory standards. Create or read maintenance reports and advise management of proposed updates or recommendations.

Knowledge & Skills:

- 1) Building Maintenance and Construction
- 2) Comprehend and Deliver Instructions
- 3) Management and Leadership
- 4) Mathematics and Measuring
- 5) Mechanical Tools and Equipment
- 6) Safety Regulations and Procedures



Similar Roles/Titles:

Facilities Manager, Facility Maintenance Supervisor, Maintenance Foreman, Maintenance Manager, Maintenance Planner

Career Interest Types:

ECR - Enterprising, Conventional, Realistic

DIRECTOR OF QUALITY ASSURANCE

SENIOR LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 8+ years

Wage Range: \$30 - \$47/hour

Plan, direct, and coordinate the activities of an organization to ensure compliance with safety, regulatory, and quality standards throughout the entire manufacturing process from the raw materials to the packaging and transportation of the final product. Oversee the department of quality assurance, training employees and consulting with other department heads.

Knowledge & Skills:

- 1) Analyze Test Results and Data
- 2) Comprehend and Deliver Instructions
- 3) Advanced Computer Programs
- 4) Management and Leadership
- 5) Mathematics and Measuring
- 6) Quality and Safety Control

Similar Roles/Titles:

Director of Quality, Quality Assurance Manager, Quality Control Manager, Quality Control Supervisor, Quality Manager, Director of Compliance, Compliance Manager

Career Interest Types:

CER - Conventional, Enterprising, Realistic

ELECTRICAL INSTRUMENTATION SUPERVISOR

SENIOR LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 8+ years

Wage Range: \$24 - \$41/hour

Lead a team to manage, repair, and maintain electrical applications and circuitry of all manufacturing, packaging, and transportation machines within a manufacturing or distribution center. Creating, logging, and communicating various employee, machine repair, and inventory reports. Supervising and training both new and existing employees.

Knowledge & Skills:

- 1) Active Listening and Observation
- 2) Mathematics and Measuring
- 3) Comprehend and Deliver Instructions
- 4) Computer and Electrical Systems
- 5) Management and Leadership
- 6) Safety Regulations and Procedures



Similar Roles/Titles:

Electrical Superintendent, Construction Project Manager, Construction Manager, Senior Project Manager, Plant Manager

Career Interest Types:

ERC - Enterprising, Realistic, Conventional

* Wage range is an average of entry level to experienced workers.

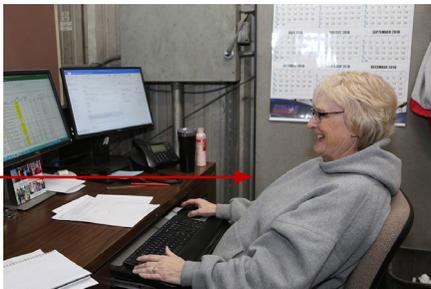


Occupations in the *Transportation & Logistics* family are responsible for purchasing and moving products and supplies throughout the entire manufacturing process, from buying parts and materials from a vendor down the street to delivering finished products to customers on the other side of the world.

Locating, purchasing, and receiving all of the raw materials and supplies needed to create and sell products is a complicated process. Logistics and supply chain management professionals find themselves at the center of it all, interacting with a wide range of departments both within the organization, such as finance, sales, and operations, and with external suppliers and customers located around the world.

Managing the complex process of incoming and outgoing shipments efficiently and effectively is both challenging and rewarding. Individuals who are organized, get along well with others, and have lots of energy often do well in these fast-paced careers.

Logistics and supply chain management are two of the most rapidly expanding sectors of the advanced manufacturing industry. There are many exciting possibilities for long-term growth and career advancement. Many of the entry-level careers require a high school diploma or equivalent, but advancement will require additional technical training and credentials, such as a fork lift certification or Commercial Driver's License (CDL).



CAREER SPOTLIGHT:

Twyla E. – Assembly Support/Inventory Control for Stellar Industries Inc. (Garner, IA)

“I spend most of my time working on ways to support the laborers and other coworkers with their inventory needs. Some of my typical duties involve inventory management, computer transactions, answering questions for the assembly team, and processing paperwork for NAFTA to keep things running smoothly. The variety of duties each day is never the same.”







SHIPPING & RECEIVING CLERK

ENTRY LEVEL

Typical Education/Training: High School Diploma/HSED

Work Experience: 0-3 years

Wage Range: \$14 - \$19/hour

Verify, prepare, and maintain records on incoming and outgoing shipments. Assemble, address, stamp, and ship merchandise or materials. Receive, unpack, verify and record incoming merchandise or materials before distribution to final locations for use in the manufacturing process.

Knowledge & Skills:

- 1) Computers and Technology
- 2) Machine Operation Basics
- 3) Shipping and Receiving Methods
- 4) Communication and Coordination
- 5) Record Keeping
- 6) Package Handling and Organization

Similar Roles/Titles:

Receiving Clerk, Receiving Manager, Shipping Coordinator, Traffic Manager, Warehouse Worker

Career Interest Types:

CRE - Conventional, Realistic, Enterprising

TRUCK DRIVER

ENTRY LEVEL

Typical Education/Training: Technical Certificate/Diploma & Commercial Driver's License (CDL)

Work Experience: 0-3 years

Wage Range: \$16 - \$23/hour

Drive trucks over established routes or within an established territory to deliver products to customers and vendors. Check vehicles to ensure that mechanical, safety, and emergency equipment is in good working order. Maneuver trucks into loading or unloading positions, following signals from loading crew and checking that vehicle and loading equipment are properly positioned.

Knowledge & Skills:

- 1) Driving and Operating Vehicles
- 2) Comprehend and Follow Instructions
- 3) Loading and Unloading Cargo
- 4) Safety Regulations and Procedures
- 5) Reliability and Problem Solving
- 6) Transportation Technology and GPS Systems



Similar Roles/Titles:

Delivery Driver, Line Haul Driver, Over the Road Driver (OTR Driver), Production Truck Driver, Semi Truck Driver

Career Interest Types:

RCS - Realistic, Conventional, Social

PACKAGING MACHINE OPERATOR

ENTRY LEVEL

Typical Education/Training: High School Diploma/HSED

Work Experience: 0-3 years

Wage Range: \$13 - \$18/hour

Operate or maintain machines that prepare industrial or consumer products for storage or shipment. Sort, grade, weigh, and inspect products, verifying and adjusting product weight or measurement to meet quality, safety, and shipping specifications, including food and meat products.

Knowledge & Skills:

- 1) Attention to Detail
- 2) Comprehend and Follow Instructions
- 3) Safety and Quality Control
- 4) Production and Processing
- 5) Adaptability and Critical Thinking
- 6) Computers and Machine Operation



Similar Roles/Titles:

Bundler, Closing Machine Operator, Filler Operator, Machine Operator, Packaging Operator, Packing Attendant

Career Interest Types:

RCE - Realistic, Conventional, Enterprising

* Wage range is an average of entry level to experienced workers.



MATERIALS HANDLER

ENTRY LEVEL

Typical Education/Training: High School Diploma/HSED

Work Experience: 0-3 years

Wage Range: \$12 - \$17/hour

Manually move freight, stock, and other materials or perform other general labor in a manufacturing or distribution center. Attach tags or mark containers with identifying information. Read work orders and record numbers of units stored, handled, or moved with production and tracking sheets or tickets.

Knowledge & Skills:

- 1) Comprehend and Follow Instructions
- 2) Gather and Analyze Data
- 3) Computers and Technology
- 4) Materials Inspection and Monitoring
- 5) Communication and Critical Thinking
- 6) Safety and Quality Control

Similar Roles/Titles:

Dock Worker, Materials Tender, Merchandise Pickup/Receiving Associate, Shipping and Receiving Materials Handler, Warehouse Worker

Career Interest Types:

REI - Realistic, Enterprising, Investigative

FORK LIFT OPERATOR

ENTRY LEVEL

Typical Education/Training: High School Diploma/HSED

Work Experience: 0-3 years

Wage Range: \$15 - \$19/hour

Operate, inspect, and maintain various types of fork lift trucks and equipment to safely and efficiently move materials and finished products in, around, and out of a warehouse or distribution center. Review product loads for accuracy, comply with safety standards, and assist in meeting production and shipping deadlines.

Knowledge & Skills:

- 1) Fork Lift/OSHA Certification
- 2) Comprehend and Follow Instructions
- 3) Materials Storage and Organization
- 4) Communication and Critical Thinking
- 5) Equipment Operation and Maintenance
- 6) Transportation and Distributions

Similar Roles/Titles:

Fork Lift Technician, Fork Lift Driver, Fork Truck Operator, Warehouse Transporter, Materials Mover

Career Interest Types:

RCE - Realistic, Conventional, Enterprising

PROCUREMENT BUYER

MID LEVEL

Typical Education/Training: Technical Certificate/Diploma

Work Experience: 4-7 years

Wage Range: \$20 - \$31/hour

Purchase resources and materials necessary for manufacturing various types of food and non-food products. Analyze past buying trends, sales records, price, and quality of merchandise to determine value and yield. Select, order, and authorize payment for equipment and supplies according to contractual agreements.

Knowledge & Skills:

- 1) Mathematics and Statistics
- 2) Sales and Negotiation
- 3) Computers and Technology
- 4) Business and Finance Fundamentals
- 5) Communication and Relationships
- 6) Create and Read Contracts

Similar Roles/Titles:

Purchasing Buyer, Purchasing Agent, Buyer, Procurement Agent, Purchasing Specialist

Career Interest Types:

ECS - Enterprising, Conventional, Social

* Wage range is an average of entry level to experienced workers.



WAREHOUSE TECHNICIAN

MID LEVEL

Typical Education/Training: Technical Certificate/Diploma

Work Experience: 4-7 years

Wage Range: \$16 - \$24/hour

Coordinate and expedite the flow of work and materials within or between departments according to production schedules. Collaborate with department supervisors to compile, review, and distribute reports on progress of work, inventory levels, costs, and production issues that may be impacting the profitability and growth of the company.

Knowledge & Skills:

- 1) Attention to Detail and Mathematics
- 2) Comprehend and Follow Instructions
- 3) Safety Regulations and Procedures
- 4) Advanced Computer Skills
- 5) Communication and Coordination
- 6) Critical Thinking and Decision Making



Similar Roles/Titles:

Logistics Technician, Warehouse Representative, Warehouse Worker, Production Project Clerk, Planning and Expediting Clerk

Career Interest Types:

CER - Conventional, Enterprising, Realistic

LOGISTICS PLANNER

MID LEVEL

Typical Education/Training: Associate's Degree

Work Experience: 4-7 years

Wage Range: \$20 - \$32/hour

Analyze and coordinate the logistical functions of an organization for the entire life cycle of a product, including receiving, distribution, and final delivery of resources, including disposal of product waste. Maintain and develop positive business relationships with a customers and vendors to assist in the long term growth and success of the company.

Knowledge & Skills:

- 1) Analyze Data and Information
- 2) Logistics and Supply Chain
- 3) Manage Clerical Procedures and Systems
- 4) Production Processing and Systems
- 5) Communication and Coordination
- 6) Supply Storage and Organization



Similar Roles/Titles:

Logistician, Logistics Team Lead, Production Planner, Logistics Analyst, Supportability Engineer

Career Interest Types:

ECR - Enterprising, Conventional, Realistic

PROCUREMENT AUDITOR

SENIOR LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 8+ years

Wage Range: \$21 - \$34/hour

Oversees and audits all purchases made by a company to ensure legal, safety, and ethical guidelines are being followed by all associated departments and personnel. Prepare and present detailed reports on audit findings and recommendations. Consult with company officials about financial and regulatory matters.

Knowledge & Skills:

- 1) Accounting and Mathematics
- 2) Financial Regulations and Laws
- 3) Advanced Computer Skills
- 4) Analytical and Critical Thinking
- 5) Records Inspection and Examination
- 6) Contracts and Procurement Procedures

Similar Roles/Titles:

Procurement Review Auditor, Purchasing Auditor, Assurance Manager, Financial Auditor, Internal Audit Director

Career Interest Types:

CEI - Conventional, Enterprising, Investigative

* Wage range is an average of entry level to experienced workers.



MATERIALS MANAGER

SENIOR LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 8+ years

Wage Range: \$30 - \$49/hour

Plan, direct, or coordinate the activities of buyers, purchasing officers, and related workers involved in purchasing materials, products, and services used in the manufacturing process. Locate, interview, and negotiate contracts with suppliers and vendors to maintain a consistent and reliable supply of materials and inventory.

Knowledge & Skills:

- 1) Deliver and Comprehend Instructions
- 2) Management and Leadership
- 3) Communication and Organization
- 4) Complex Problem Solving Skills
- 5) Sales and Negotiation
- 6) Warehouse and Inventory Management

Similar Roles/Titles:

Inventory Supervisor, Inventory Manager, Purchasing Manager, Director of Purchasing, Commodity Manager

Career Interest Types:

ECS - Enterprising, Conventional, Social

WAREHOUSE MANAGER

SENIOR LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 8+ years

Wage Range: \$26 - \$42/hour

Plan, direct, and coordinate the storage and distribution operations within an organization. Work with team leads and other staff to prepare and manage departmental budgets. Supervise the activities of workers engaged in receiving, storing, testing, and shipping products or materials.

Knowledge & Skills:

- 1) Electronic Inventory Control Systems
- 2) Comprehend and Deliver Instructions
- 3) Management and Leadership
- 4) Safety and Quality Control
- 5) Communication and Relationships
- 6) Mathematics, Data, and Analytics

Similar Roles/Titles:

Distribution Center Manager, Distribution Manager, Shipping Manager, Warehouse Operations Manager, Warehouse Supervisor

Career Interest Types:

ECS - Enterprising, Conventional, Social

SUPPLY CHAIN MANAGER

SENIOR LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 8+ years

Wage Range: \$23 - \$45/hour

Direct or coordinate production, purchasing, warehousing, distribution, or financial forecasting activities to limit costs and improve accuracy, customer service, or safety. Examine existing procedures for opportunities to streamline inventory management activities and systems to meet production and distribution needs.

Knowledge & Skills:

- 1) Analyze Test Results and Data
- 2) Computers and Technology
- 3) Sales and Negotiation
- 4) Critical Thinking and Adaptability
- 5) Communication and Coordination
- 6) Supply Chain and Logistics

Similar Roles/Titles:

Supply Chain Director, Supply Chain Vice President, Logistics Manager, Logistics Solution Manager, Logistics Operation Manager

Career Interest Types:

ECI - Enterprising, Conventional, Investigative

* Wage range is an average of entry level to experienced workers.

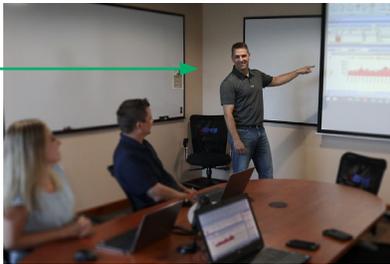


In the *Sales and Marketing* family, workers can use their technical know-how, outgoing personality, and competitive nature to research, design, and sell various products needed by their customers around the world. Some sales roles may even allow performance or commission-based pay and benefits, allowing workers to make substantially more than their base wages.

Simply designing and building great products is not enough to guarantee a company's success. Customers also need to be aware of and understand the value of its products. Sales and marketing experts conduct market research, help inform the customer about the product, and determine the best solution for their needs through direct consultations, social media, industry trade events, and other engagement techniques. Good communication, customer service, and relationship building skills are very important for these careers.

Changing customer needs and increasingly complex products often require sales and marketing teams to work with production or engineering departments to understand how products could be designed or further customized for different types of people or uses. Some marketing or sales workers may even have an influence on new or improved products because of their direct interaction and customer service roles.

A career in sales or marketing is ideal if you're a "go-getter," enjoy working with people, and want to help customers find the right product or solution to improve their lives. Many of these careers will require a technical certificate or bachelor's degree, but may allow exceptions for those with previous sales or manufacturing experience who can "talk the talk" about products to customers.



CAREER SPOTLIGHT:

Doug W. – Sales and Operations Planning Administrator for Kreg Tool Company (Huxley, IA)

"I develop the sales forecast, which means I spend much of my day trying to put my finger on the pulse of our retail consumers. I analyze historical sales data to determine sales levels and trends, while looking for seasonal profiles that may be repeatable and therefore predictable that I can use to model into future sale forecasts. Having always been intrigued by economies and what makes them tick, forecasting demand in the manufacturing sector is like trying to master a sub-set of the larger economy."







SALES REPRESENTATIVE

ENTRY LEVEL

Typical Education/Training: High School Diploma/HSED

Work Experience: 0-3 years

Wage Range: \$17 - \$34/hour

Identify the needs of current and potential customers through direct and indirect interaction and research. Match customer needs with product offerings, negotiate sales, and train customers to operate and maintain new equipment. Estimate or quote prices, credit or contract terms, warranties, and delivery dates. Opportunity for increased wages through commissions based on sales performance.

Knowledge & Skills:

- 1) Communication and Interpersonal Skills
- 2) Sales and Negotiation
- 3) Social Media and Marketing
- 4) Technical Knowledge of Product
- 5) Computers and Technology
- 6) Customer Service and Critical Thinking



Similar Roles/Titles:

Sales Associate, Outside Sales, Inside Sales, Marketing Representative, Technical Sales Representative

Career Interest Types:

ECS - Enterprising, Conventional, Social

CUSTOMER SERVICE REPRESENTATIVE

ENTRY LEVEL

Typical Education/Training: High School Diploma/HSED

Work Experience: 0-3 years

Wage Range: \$13 - \$19/hour

Interact with customers by phone, email, online, and in person to provide information in response to inquiries about products and services. Handle, record, and resolve complaints when necessary, weighing the needs of the customer and the company for long term growth and success.

Knowledge & Skills:

- 1) Customer and Personal Service
- 2) Critical Thinking and Problem Solving
- 3) Sales and Marketing
- 4) Social Media and Communication Tools
- 5) Active Listening and Understanding
- 6) Conflict Management and Resolution

Similar Roles/Titles:

Customer Service Agent, Call Center Representative, Customer Care Representative, Customer Service Specialist, Member Services Representative

Career Interest Types:

ESC - Enterprising, Social, Conventional

MARKETING SPECIALIST

MID LEVEL

Typical Education/Training: Technical Certificate/Diploma

Work Experience: 4-7 years

Wage Range: \$19 - \$31/hour

Research market conditions and gather information to determine potential sales of a product or service in local, regional, or national areas. Measure the effectiveness of marketing, advertising, and communications programs and strategies. Collect and analyze data on competitors, customers, prices, sales, and methods of marketing and distribution.

Knowledge & Skills:

- 1) Research, Data, and Analytics
- 2) Customer and Personal Service
- 3) Critical Thinking and Problem Solving
- 4) Sales and Marketing
- 5) Social Media and Communication Tools
- 6) Computers and Technology

Similar Roles/Titles:

Business Development Specialist, Communications Specialist, Market Analyst, Marketing Research Analyst, Market Research Consultant

Career Interest Types:

IEC - Investigative, Enterprising, Conventional

* Wage range is an average of entry level to experienced workers.



CUSTOMER SERVICE SUPERVISOR

MID LEVEL

Typical Education/Training: Associate's Degree

Work Experience: 4-7 years

Wage Range: \$18 - \$28/hour

Plan, direct, and coordinate the activities of customer service agents and representatives of the organization who answer questions, address complaints, and may handle billing for customers. Handle complex or elevated cases and customer complaints. Assist in the training and professional development of new and existing employees.

Knowledge & Skills:

- 1) Management and Leadership
- 2) Customer and Personal Service
- 3) Comprehend and Deliver Instructions
- 4) Conflict Management and Resolution
- 5) Active Listening and Understanding
- 6) Computers and Technology

Similar Roles/Titles:

Administrative Supervisor, Personnel Coordinator, Office Supervisor, Client Facing Supervisor, Customer Service Lead

Career Interest Types:

ECS - Enterprising, Conventional, Social

SOCIAL MEDIA STRATEGIST

MID LEVEL

Typical Education/Training: Technical Certificate/Diploma

Work Experience: 4-7 years

Wage Range: \$19 - \$31/hour

Create, launch, and monitor marketing and sales initiatives through various digital and online channels, specifically social media applications and tools. Measure the effectiveness of marketing, advertising, and communications programs and strategies. Improve company culture through direct interaction with current and prospective employees via social media tools, events, and games.

Knowledge & Skills:

- 1) Social Media Tools & Data Analytics
- 2) Sales and Marketing
- 3) Negotiation and Persuasion
- 4) Critical Thinking and Problem Solving
- 5) Computers and Mobile Technology
- 6) Customer and Personal Service

Similar Roles/Titles:

Digital Marketing Specialist, Social Media Specialist, Social Media Manager, Social Media Analyst, Social Media Coordinator

Career Interest Types:

IEC - Investigative, Enterprising, Conventional

MARKETING MANAGER

SENIOR LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 8+ years

Wage Range: \$30 - \$55/hour

Plan, develop, and coordinate marketing policies and programs, such as determining product demand and competitive market analysis. Develop pricing strategies with the goal of maximizing profits or share of the market while ensuring customers are satisfied. Oversee product development or monitor trends that indicate the need for new products and services.

Knowledge & Skills:

- 1) Deliver and Comprehend Instructions
- 2) Management and Leadership
- 3) Negotiation and Persuasion
- 4) Analytical Thinking and Problem Solving
- 5) Sales and Marketing
- 6) Customer and Personal Service

Similar Roles/Titles:

Director of Marketing, Brand Manager, Business Developer, Marketing Officer, Marketing Planner

Career Interest Types:

ECS - Enterprising, Conventional, Social

* Wage range is an average of entry level to experienced workers.



TECHNICAL SALES ENGINEER

SENIOR LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 8+ years

Wage Range: \$31 - \$52/hour

Sell products requiring extensive technical expertise and support for installation and use, such as material handling equipment, numerical-control machinery, and computer systems. Prepare and deliver technical presentations that explain products or services to current and prospective customers, sometimes at work sites, trade shows, and on live production floors.

Knowledge & Skills:

- 1) Design and Drafting Software
- 2) Sales and Marketing
- 3) Social Media and Communication Tools
- 4) Technical Knowledge of Manufacturing
- 5) Visual Creativity and Communication
- 6) Customer and Personal Service

Similar Roles/Titles:

Senior Sales Engineer, Customer Engagement Manager, Product Manager, Product Sales Engineer, Account Executive

Career Interest Types:

ERS - Enterprising, Realistic, Social

CUSTOMER SERVICE MANAGER

SENIOR LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 8+ years

Wage Range: \$26 - \$43/hour

Oversee the management and coordination of all customer service agents, administrative staff, and other employees of the organization who interact directly or indirectly with customers. Review and negotiate contracts, service level agreements, and other financial or budgetary models to ensure long term success and growth for the organization.

Knowledge & Skills:

- 1) Management and Leadership
- 2) Customer and Personal Service
- 3) Contracts, Budgets, and Financial Models
- 4) Active Listening and Understanding
- 5) Personal and Professional Development
- 6) Sales and Marketing

Similar Roles/Titles:

Customer Service Coordinator, Customer Service Director, Client Facing Manager, Administrative Officer, Business Administrator

Career Interest Types:

ECS - Enterprising, Conventional, Social

SALES MANAGER

SENIOR LEVEL

Typical Education/Training: Bachelor's Degree

Work Experience: 8+ years

Wage Range: \$29 - \$56/hour

Plan, direct, and coordinate sales distribution and strategy by establishing sales territories, quotas, and goals, including the establishment of associated training programs for sales representatives. Analyze sales statistics gathered by staff to determine variables such as sales potential, inventory requirements, and changing customer preferences.

Knowledge & Skills:

- 1) Deliver and Comprehend Instructions
- 2) Management and Leadership
- 3) Negotiation and Persuasion
- 4) Analytical Thinking and Problem Solving
- 5) Sales and Marketing
- 6) Customer and Personal Service

Similar Roles/Titles:

National Sales Manager, Regional Sales Manager, Sales and Marketing Vice President, Sales Director, Sales Supervisor

Career Interest Types:

ECS - Enterprising, Conventional, Social

* Wage range is an average of entry level to experienced workers.

ADDITIONAL CAREER OPTIONS - THERE IS A CAREER FOR EVERYONE IN ADVANCED MANUFACTURING!

Don't see a career you like? This document is not meant to cover every possible career option in the advanced manufacturing industry in Iowa, so don't worry if you don't see something that immediately grabs your attention or seems to match your career interest type. There are a wide range of additional career options available that are necessary for all types of businesses, regardless of industry, size, or location. Below are just a few examples of where you might also fit within this exciting and fulfilling industry:

- **INFORMATION TECHNOLOGY** – A wide range of careers that focus on the use of computers and other technology to receive, store, transmit, and work with different types of information and data.
COMPUTER PROGRAMMERS, CYBER SECURITY ANALYSTS, NETWORK ENGINEERS, HELP DESK SUPPORTS, GRAPHIC DESIGNERS, AND WEB DEVELOPERS.
- **HUMAN RESOURCES** – Those in charge of overseeing various aspects of employment for a company, such as recruitment, employee benefits, and compliance with labor laws.
HIRING MANAGERS, BENEFITS COORDINATORS, TRAINING AND DEVELOPMENT SPECIALISTS, PAYROLL ADMINISTRATORS, HEALTH AND SAFETY SUPPORT, AND RECRUITERS.
- **ADMINISTRATIVE AND FINANCIAL SERVICES** – A group of support careers that assist in the day-to-day operations of a successful company, such as keeping track of finances, monitoring government regulations, and administrative support to other departments.
ACCOUNTANTS, FINANCIAL ANALYSTS, ADMINISTRATIVE ASSISTANTS, FINANCIAL ADVISORS, AND SUPPORT CLERKS.
- **SKILLED & MECHANICAL TRADES** – Buildings and facilities take a lot of time and work to maintain, so companies sometimes employ specialized workers or contractors to keep a facility properly maintained and running smoothly.
PLUMBERS, ELECTRICIANS, HEATING AND AIR CONDITIONING INSTALLERS, CONSTRUCTION WORKERS, AND INDUSTRIAL PAINTERS.
- **EXECUTIVE MANAGEMENT** – A team of individuals at the highest level of management of an organization who oversee the mission, vision, and general tasks of managing an organization.
PRESIDENTS, VICE PRESIDENTS, CHIEF OPERATIONS OFFICER (COO), CHIEF INFORMATION OFFICERS (CIO), AND CHIEF EXECUTIVE OFFICERS (CEO).



NEXT STEPS & PLANNING RECOMMENDATIONS

This document was meant to begin the conversation about the great career opportunities available in the advanced manufacturing industry in Iowa. Below are some additional recommendations for next steps readers can take to continue their career exploration journey. Utilize the basic career exploration plan and notes sections of the next few pages to begin putting thought into action. Links have been provided to help guide readers to additional online resources.

STUDENTS AND JOB SEEKERS

- ▶ **FUTURE READY IOWA CAREER COACH** – The free interactive Career Coach tool at FutureReadyIowa.gov is a great way for students and job seekers of all ages to learn more about their career interests and research specific occupations in advanced manufacturing, including the ability to customize labor market information, education offerings, and employer listings to their specific geographic location.
- ▶ **VOLUNTEER, JOB SHADOWS, OR TOURS** – Contact an employer directly to ask questions, learn about current openings, and to request either a site tour or job shadow opportunity for a better idea of what it would be like to work for them. Internships and volunteering are also great opportunities to earn experience, build up a resume, and test out a career before making any long-term and expensive career decisions. Consult with counselors and educators for local opportunities or visit VolunteerIowa.org to search for additional openings.
- ▶ **EARN SKILLS AND CERTIFICATIONS** – Many careers in this industry will rely on some foundational skills and certifications that can be earned relatively easily and affordably by students and job seekers proactively before entering the workforce. Some schools even have dual-enrollment or pre-apprenticeship agreements that allow students to earn college credit and even full work certifications before graduating. Having these skills, experience, and certifications will increase your chances of landing a great job compared to others who have not taken any such action to improve themselves.

EMPLOYERS, EDUCATORS, AND COMMUNITY SUPPORT PARTNERS

- ▶ **WORK-BASED LEARNING INTERMEDIARY NETWORK** – The Intermediary network is made up of 15 regional networks that serve as a single one-stop point of contact by connecting businesses and schools with work-based learning opportunities. These can include job shadows, internships, site tours, guest speakers, and educator externships. Contact your regional [Intermediary](#) and access the [Work-Based Learning Guide](#) to learn more about setting up a successful local work-based learning experience. With adult supervision and appropriate safety measures, youth under the age of 18 can work in this industry.
- ▶ **IOWA STEM TEACHER EXTERNSHIPS** – Teachers across Iowa have the opportunity to take advantage of an externship program, where during the summer, they work side-by-side with knowledgeable and skilled manufacturers who help bring the classroom curriculum to life. Teacher Externships are full-time, six-week temporary summer positions in local businesses and agencies for secondary teachers of mathematics, science, and/or technology. Teachers earn a stipend of up to \$4,800 (including two days of professional development), as well as one graduate credit through the University of Northern Iowa's Continuing Education program. Teacher Externships provide educators with the exposure to answer questions about real-world application, prepare students for careers they may have in the future, and improve educational experiences. Visit IowaSTEM.gov/externships to learn more and apply for these great opportunities.
- ▶ **SECTOR PARTNERSHIPS AND BOARDS** – Employers, educators, and other community support partners can take a more active role in training and developing their local workforce by meeting to collaborate on local education, economic, and community issues. These employer-led groups are often referred to as sector partnerships or sector boards. There are currently over 60 of them spread throughout Iowa, with over 15 devoted exclusively to advanced manufacturing. More information, group locations, contact information, and resources can be found at SectorPartnerships.EducateIowa.gov.

MY CAREER EXPLORATION ACTION PLAN

Use the following template to create a career exploration action plan for taking the next steps towards a fun, exciting, and fulfilling career in advanced manufacturing!

	What is the goal?	Who is involved?	How will it be completed?	Where will it be completed?	When will it be completed?
Goal Example	I want to actually see what it's like to be a Welder.	Me, my teacher, my parents, a Welder, and an employer.	I will watch videos online and call a local employer to set up a job shadow opportunity to sit with and observe a real Welder at work.	Online and in-person at a local employer.	Summer 2019
Goal #1					
Goal #2					
Goal #3					
Goal #4					



**COMMUNITY COLLEGES &
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