



# MANUFACTURING CAREER PATHWAY GUIDE

CAREERS IN MANUFACTURING  
ON THE SOUTH SHORE OF MASSACHUSETTS





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Note on Document Content: The information presented in this Manufacturing Career Pathway Guide was generated from a variety of public and private resources and entities from throughout the Commonwealth. The data and statistics referenced were generated from the Manufacturing on the South Shore of Massachusetts Report completed by the MassHire South Shore Workforce Board in November 2017. A copy of this report is available on [MassHireSouthShorewb.com](http://MassHireSouthShorewb.com).

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## ADVANCED MANUFACTURING

is a vibrant, dynamic and growing industry within the South Shore, as well as throughout the Commonwealth of Massachusetts. As the 5th largest industry in the region Manufacturing is considered a critical industry, providing a variety of quality and sustainable employment opportunities for all skill levels. Industry trends predict that with the continued evolution of new technology and innovation, manufacturing will remain on a positive growth trajectory over the next ten years.

Though the outlook for the manufacturing industry is optimistic, employers are growing increasingly concerned about hiring the right people to fill the necessary positions left by an aging and retiring workforce. Manufacturers also worry about finding qualified candidates for new technology-driven positions necessary for manufacturing innovation. The top priority that many manufacturers list in their strategy for continued growth is recruiting and retaining a high quality workforce. According to the Massachusetts Manufacturing Extension Partnership (MassMEP), this challenge is the number one barrier to manufacturing growth in the state.

Although the manufacturing workforce is changing across the nation, these changes are not happening rapidly enough. Data from the American Community Survey (ACS) indicates that the median age for the manufacturing workforce is 47 years of age, two years older than the median age of the state as a whole. More than 27% of today's manufacturing workforce in the southeastern Massachusetts region will reach retirement age within the next 10 years. This segment of the workforce is larger in southeastern Massachusetts respective to the state or the nation as a whole. The need for a steady pipeline of qualified candidates for man-

ufacturing jobs is therefore higher in southeastern Massachusetts than most other areas.

Many people consider manufacturing important to the local and national economy, however the public perception of the industry is that it is a dirty environment, with low paying jobs and limited career growth. Many do not realize the technical complexity that modern manufacturing entails. Additionally, the cultural perception of manufacturing is seen as biased toward men, however new recruiting strategies are beginning to reach out to underrepresented populations, including women in an effort to promote manufacturing as an inclusive and exciting environment for all workers.

In addition to attracting a diverse workforce manufacturers also need their employees to be flexible and team-oriented, as well as proactive and willing to tackle any problems that come their way. This is necessary, as the landscape of manufacturing has changed drastically over the last generation, and innovation in production, delivery, and customer service is necessary for many manufacturers today to survive in a very competitive economy.

In an effort to address the workforce demand of local manufacturers the MassHire South Shore

Workforce Board has created this Career Pathway Guide to provide an overview of the manufacturing career opportunities and to identify numerous education and training programs available to help individuals obtain the essential skill sets required to access the various career opportunities.

The Guide clearly identifies the sequence of education coursework and/or training credentials which are aligned with the industry validated work readiness standards and competencies. The information organizes the available education, training and career development services to meet the needs of the individual interested in a manufacturing career, and to help that individual not only obtain a job but advance within the manufacturing occupational cluster.

The MassHire South Shore Workforce Board (MHSSWB), in collaboration with the MassHire South Shore Manufacturing Advisory Group (a sub-committee of MHSSWB), has developed this Guide as part of an overall initiative to support the current and future growth of this Critical Industry in the South Shore. Established in the Spring of 2018, the South Shore Manufacturing Advisory Group consists of representatives from area manufacturers, educational institutions and industry associations. The Advisory Group is working diligently on the implementation of a variety of action items identified in a 2017 Manufacturing on

the South Shore of Massachusetts Report, which highlights the challenges and opportunities impacting the industry in our region today.

The MHSSWB is one of 16 Workforce Boards across the Commonwealth of Massachusetts tasked with ensuring the alignment of strategic, market driven workforce goals and initiatives through collaboration among local businesses, educational institutions and community organizations. Under the direction of Governor Charlie Baker and the Executive Office of Labor and Workforce Development the MHSSWB has oversight responsibility and policy-making authority for federal and state workforce development activities in the South Shore. The MHSSWB works in collaboration with the MassHire South Shore Career Center (MHSSCC) to administer the work of the Massachusetts Career Center network to support the workforce needs of businesses and job seekers.

The development of this Manufacturing Career Pathway Guide is intended to address one of the top Action Items identified in the 2017 Manufacturing on the South Shore of Massachusetts Report and the industry's most pressing need – to create a pipeline of skilled workers.

### **Your Career in Manufacturing is Waiting!**



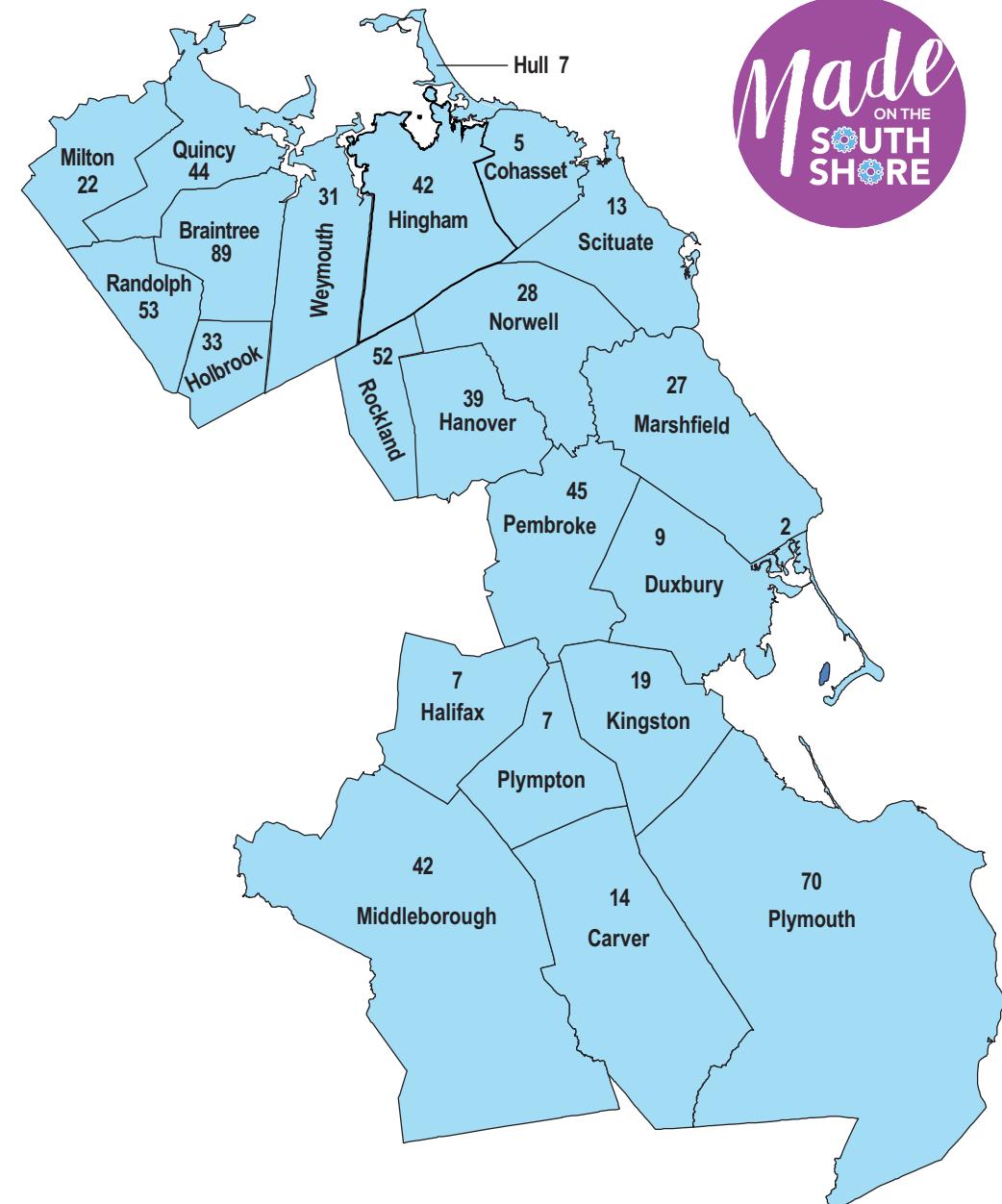
## SECTION II

## WHY A CAREER IN ADVANCED MANUFACTURING ON THE SOUTH SHORE?

Advanced Manufacturing combines new information technology with advanced machinery, and is considered one of the country's most critical industry sectors. In Massachusetts, manufacturing generates approximately 10% of the state's GDP and accounts for about 6% of the total employment base with wage growth of over 27% expected in the next ten years.

The South Shore region of Massachusetts has over 400 manufacturing companies, making it an important contributor to the local economy and a provider of numerous employment opportunities for all skill levels. The South Shore has representation from virtually every type of manufacturing ranging from machinery manufacturing, chemical manufacturing to bakeries and breweries. In other parts of the state you will find manufacturers clustered together in industrial park environments, which is not typically the case in the South Shore. The adjacent map depicts the locations of the manufacturers in our region, showing a relatively even distribution of companies across the 22 community region.

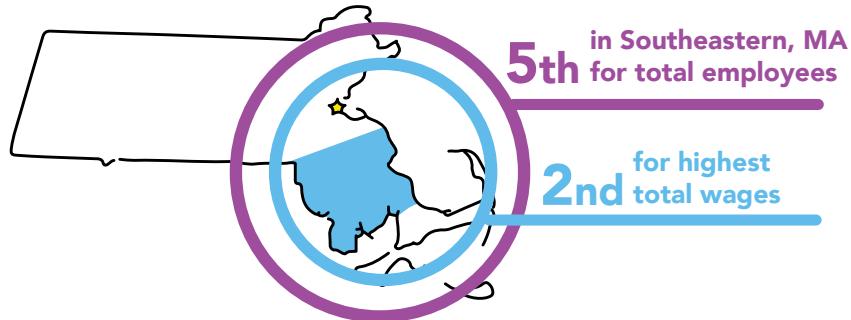
Industry leaders note that innovation and technology has stimulated the expansion of the region's manufacturing sector, however they also identified that the number one factor inhibiting their continued growth is not having a steady pipeline of workers to fill the available jobs. Manufacturing careers require a higher skill level today than in the past, and the good news is that wages have begun to reflect this specialization. Workers take home an average of \$20,000 more than the average non-manufacturing employee in MA. Although manufacturing is the 5th largest industry in Southeastern MA in reference to the number of employees, it ranks the second highest in regards to gross wages of all employees.



Number of Manufacturers by Community on the South Shore.

in the region. In fact, almost half (48.8%) of the Production Workers in manufacturing in Massachusetts are employed in the Southeastern part of the state, which includes the South Shore.

## MANUFACTURING RANKS



The challenge, however is that people are generally unaware of the new career opportunities in this changing industry, as well as the various entry points for an individual whether one is a recent high school graduate, a participant in a specialized certification program, in possession of a 2-4 year college degree, or seeking a career change using transferable skills. In manufacturing, advancement opportunities are determined by experience, training and the ability to perform complicated tasks. Company leaders continuously note that a workers attitude and potential are just as important as a degree or certificate. If you are flexible, curious, tech-savvy and ready to engage and eager to learn there is a manufacturing career waiting for you.

The manufacturing sector today is extremely diverse; crossing numerous industry sectors that drive our local, state and national economy. The sector is comprised of establishments that engage in the mechanical, physical or chemical transformation of materials, substances or components into new products. Yes the image of an assembly line process to make a car is manufacturing, but so are the corner bakery, village tailor shop, local brewery, and numerous other businesses that produce products evolved from the agriculture, fishing, forestry and quarrying industry sectors.

It is also important to note that there are multiple career pathway opportunities within the manufacturing sector. Numerous quality support positions such as Research and Development, Marketing, Financial Management, Administration, Public Relations and Human Resource positions can be transferable from other industry clusters in the region. While many jobs involve working directly on machines or "on the line", they are certainly not the only career path opportunities in this industry.

In manufacturing you will enjoy a career in high-tech machinery and cutting edge software in a variety of in-demand markets such as Medical, Information Technology, Defense and Renewable Energy. You will work in a creative environment as part of a team and make an average of \$45,000 with an Associate Degree and upwards of \$75,000 with a four-year degree.

For additional information and data on the growth of the Manufacturing Industry in the region please visit <http://www.MassHireSouthShorewb.com> and download a copy of the Manufacturing on the South Shore of Massachusetts Report on this critical industry cluster.

## IS A CAREER IN MANUFACTURING ON THE SOUTH SHORE FOR YOU?

Manufacturing companies use advanced production techniques to develop a wide range of products that we use every day. Do you like to tinker with machines? Have a good technical and mathematical aptitude? Do you use logic and reason to figure things out? Can you concentrate on tasks when necessary? Does the idea of reading blueprints seem interesting? Do you enjoy working with computers?

If you answered yes to any of these questions then a Manufacturing Career may be a great opportunity for you, and this Career Pathway Guide provides you with the information to make it happen.



## SECTION III A

## ESTABLISHING A CAREER PATHWAY IN MANUFACTURING

There are many entry points for an individual interested in a career in manufacturing, whether one is a recent high school graduate, a participant in a specialized certification program, in possession of a 2-4 year degree, or seeking a career change using transferable skills.

Currently, 31% of manufacturing employees have earned a baccalaureate degree or higher, and an additional 23% have had some College training or earned an associates degree. Though this makes up the majority of the manufacturing workforce, the proportion of this workforce with post-secondary training is lower compared to Massachusetts state averages. This means that there are numerous entry points for individuals with a high school degree, who have the work ethic to take advantage of the career enhancement opportunities available.

Significant pay increases follow those employees who do go on to earn a bachelor's degree following an associates degree. Workers can go from making an average of about \$45,000 to about \$75,000 per year with a four-year degree, and many manufacturers offer tuition reimbursement for individuals who are committed to a manufacturing career and to the company.

Individual manufacturers are working with community organizations, national or regional industry organizations, and/or other industry partners to develop the necessary programming that will create a qualified talent pipeline from which to recruit. Manufacturers are also working with one another to agree on the competencies, skills, and work habits that are needed within their specific field(s) of manufacturing and area specializations.

In coordination with industry partners, vocational — technical schools as well as post-secondary institutions, the industry is beginning to recognize the value of stackable credentials, where students and employees can enter the manufacturing workforce, sharpen their skills, and progress in their careers. These stackable credentials allow students to receive basic, entry-level training to enter the manufacturing workforce. Then additional credentials at the certificate, associate, bachelors, and advanced levels for new, continuing, and returning employees will ensure they have the foundational skills to succeed in all levels of the manufacturing industry.

The following pages provide a comprehensive overview of the career pathway opportunities in manufacturing and the various education and employment programs and resources available to help you along the way.

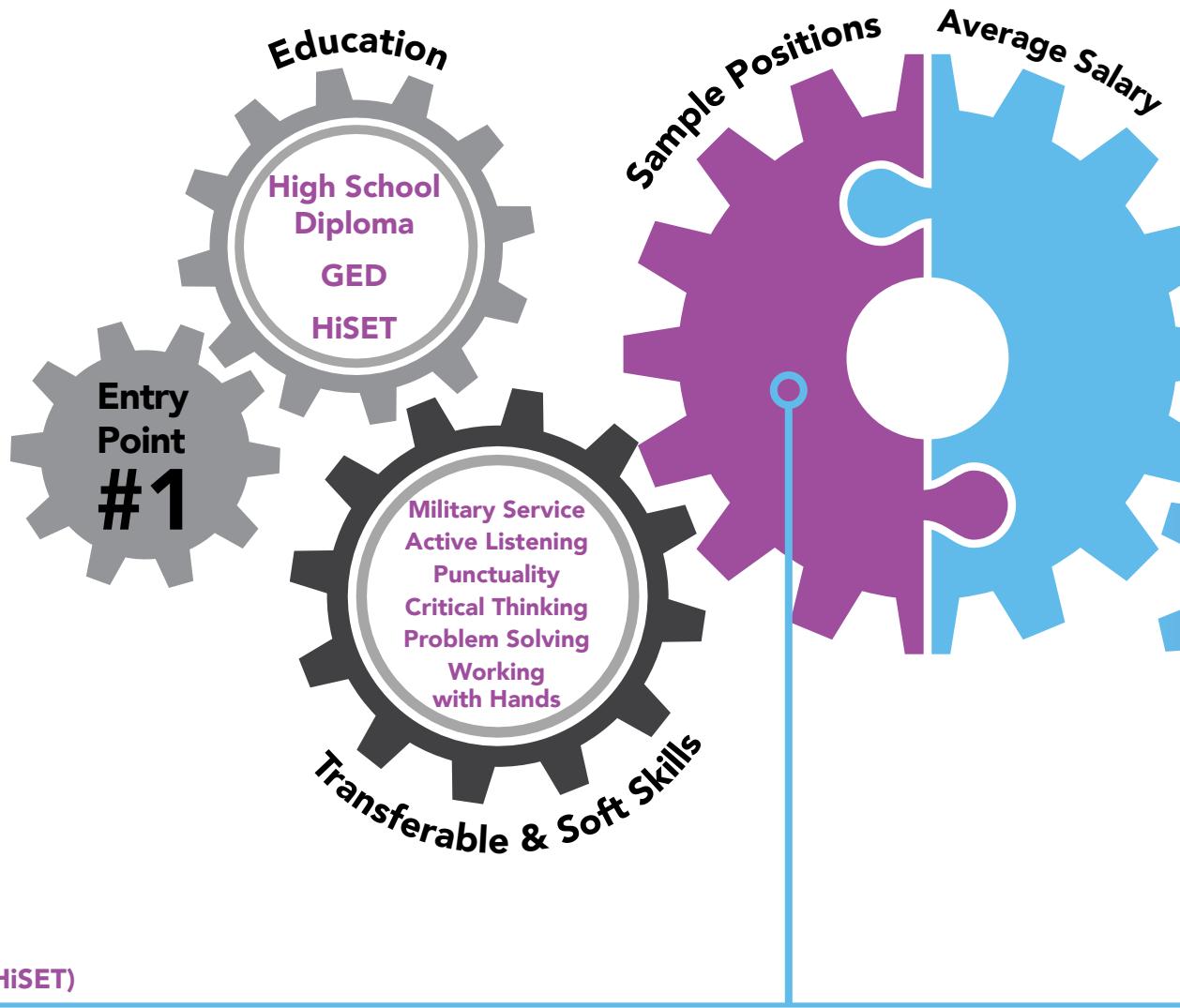


## LEVEL 1

The manufacturing industry offers numerous employment opportunities for individuals with a high school diploma or equivalency (GED or HiSET). Many manufacturers provide a variety of entry level positions with good starting salaries and great benefits. Once you begin learning new skill sets while working you will become associated with the many career pathway opportunities available to help you advance through increased responsibilities and increased wages.

Transferable and Soft skills are also important elements to help you advance your manufacturing career (refer to page 20 for additional information).

The information provided in "Level 1" provides a sampling of the employment opportunities and associated salary expectations. It is important to note that every manufacturing company provides different salary and benefit structures, and the information provided is an average industry standard for the region.



### ENTRY LEVEL (High School Degree, GED, HiSET)

#### TEAM ASSEMBLER:

Uses components and parts to produce machines, goods, products, and other objects. Reads and interprets blueprints, positions parts, and examines connections for correct fit. Performs repairs as needed and reports errors in assembly line.

#### PRINTER:

Operates and tends printing presses. Performs traditional printing methods, such as offset lithography, gravure, flexography, and letterpress.

#### CUTTER:

Adjusts guides and stops to control depths and widths of cuts. Cuts, shapes, and trims materials, such as textiles, food, glass, stone, and metal, using knives, scissors, and other hand tools, portable power tools, or bench-mounted tools.

#### PACKAGER/SHIPPER:

Stacks and piles goods in their correct containers and preparing them for shipping including the organizing, scheduling and tracking of the shipped items using various types of equipment.

#### PRODUCTION WORKER:

Operates and maintains equipment to prepare items for shipment, which involves assembling and preparing parts and ensuring equipment runs smoothly.

## PATHWAYS TO ADVANCEMENT

\$14-\$16/Hour  
\$33,000/Year

**Plus Benefits**  
Medical & Dental  
Tuition Reimbursement  
Retirement  
Vacation

A variety of advancement opportunities are available after your first year through experience and on-the-job training.

Advancement continues if you obtain additional training, licensing, certification classes and/or college credit courses — with many companies providing tuition reimbursement.

*Consider Moving onto*

**Entry Point #2** ➔

### ENTRY LEVEL

#### MACHINIST:

Sets up, operates and maintains a variety of machine tools to produce precision parts and instruments.

#### ADMINISTRATIVE

#### ASSISTANT:

Assists Management with daily office needs and undertakes the general administrative activities.

#### QUALITY ASSURANCE:

Works with operating staff to establish procedures, standards and systems required to effectively and efficiently produce a product or service.



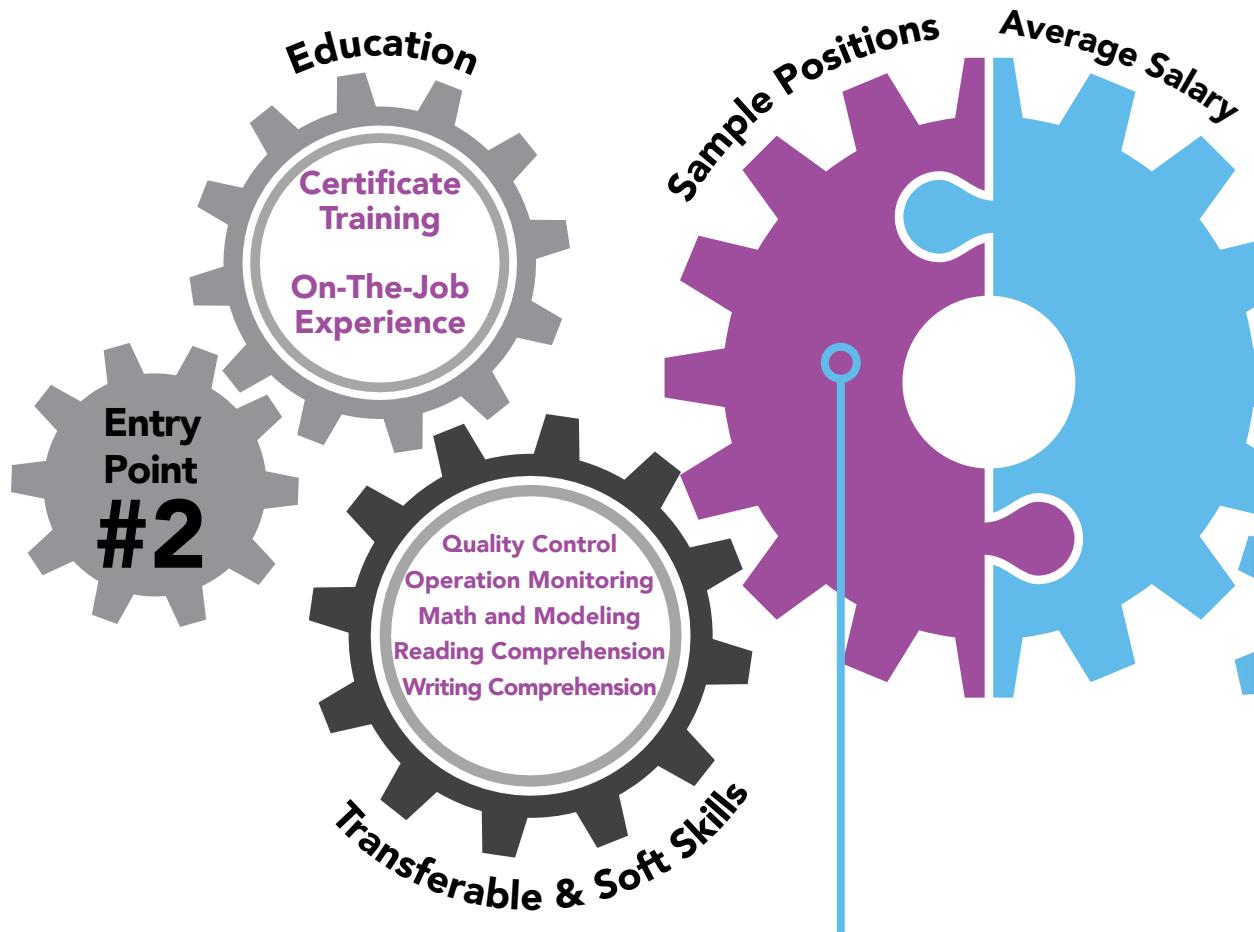


## LEVEL 2

The manufacturing industry offers numerous employment opportunities for individuals with additional training and on-the-job experience in combination with a high school diploma or equivalence (GED or HiSET). As you learn new skill sets while working and begin to take advantage of different training opportunities provided by the company you will have the opportunity to advance – increasing responsibilities and increasing wages.

Transferable and Soft skills are also an important elements to help you advance your manufacturing career (refer to page 20 for additional information).

The information provided in "Level 2" provides a sampling of the employment opportunities and associated salary expectations available at this moving up point in your career. It is important to note that every manufacturing company provides different salary and benefit structures and the information provided is an average industry standard for the region.



### CERTIFICATION AND ON-THE-JOB TRAINING

#### **ENTRY LEVEL WELDER 1:**

Joins, fabricates and repairs metal and other weldable materials by applying appropriate welding techniques and operating various welding devices. Interprets blueprints, diagrams and schematics to determine appropriate welding process.

**CNC MACHINIST:** Produces machined parts by programming, setting up, and operating a computer numerical control (CNC) machine; maintaining quality and safety standards; keeping records; maintaining equipment and supplies.

#### **MECHANICAL TECHNICIAN:**

Assists Mechanical Engineers in designing, testing, perfecting and maintaining products, machinery and equipment. Mechanical Technicians typically work on transportation, industrial, electrical and manufacturing machines.

#### **ELECTRONICS ENGINEER:**

Designs electronic components, software, products, or systems for commercial, industrial, medical, military, or scientific applications. Analyzes customer needs and determines electrical system requirements, capacity, and cost to develop a system plan.

#### **ELECTRONICS ASSEMBLER:**

Assembles electrical or electronic systems or support structures and install components, units, subassemblies, wiring, or assembly casings, using rivets, bolts, soldering or micro-welding equipment. Build products such as electric motors, computers, electronic control devices, and sensing equipment.

#### **MACHINE TOOL SETTER:**

Machine setters in the metalworking and plastics industries set up machines for operation and production and may adjust the machinery during its operation. Many workers both set up and operate equipment.

## PATHWAYS TO ADVANCEMENT

\$18-\$28 /Hour  
\$45,000 /Year

**Plus Benefits**  
Medical & Dental  
Tuition Reimbursement  
Retirement  
Vacation

A variety of advancement opportunities are available after your first year through experience and on-the-job training.

Advancement continues if you obtain additional training, licensing, certification classes and/or college credit courses — with many companies providing tuition reimbursement.

**Consider Moving onto**

**Entry Point #3** ➔

**CMM OPERATOR:** Coordinate Measuring Machine (CMM) programmers create inspection programs for coordinate measuring machines and devices that measure an object's physical characteristics such as dimensions and other geometrical qualities.

**QUALITY INSPECTOR:** Monitor operations to ensure that they meet production standards. Recommend adjustments to the assembly or production process. Inspect, test, or measure materials or products being produced.

**MATERIAL HANDLER:** Maintains inventory by identifying, labeling, and placing materials and supplies in stock; recording location of inventory. Prepares finished stock for shipment by identifying, pulling, packing, crating, loading, and securing product. Documents product shipment by recording units shipped.

**LABORATORY TECHNICIAN:** Works with complex systems or perform highly technical mechanical or diagnostic tests in medical or scientific laboratories. Technicians might collect samples, study



and perform tests on body fluids, teeth, chemical compounds, biological specimens, or other fields of science

**SERVICE TECHNICIAN:** Provides service and customer support during field visits or dispatches. Manages all on site installation, repair, maintenance and test tasks. Diagnoses errors or technical problems and determining proper solutions.

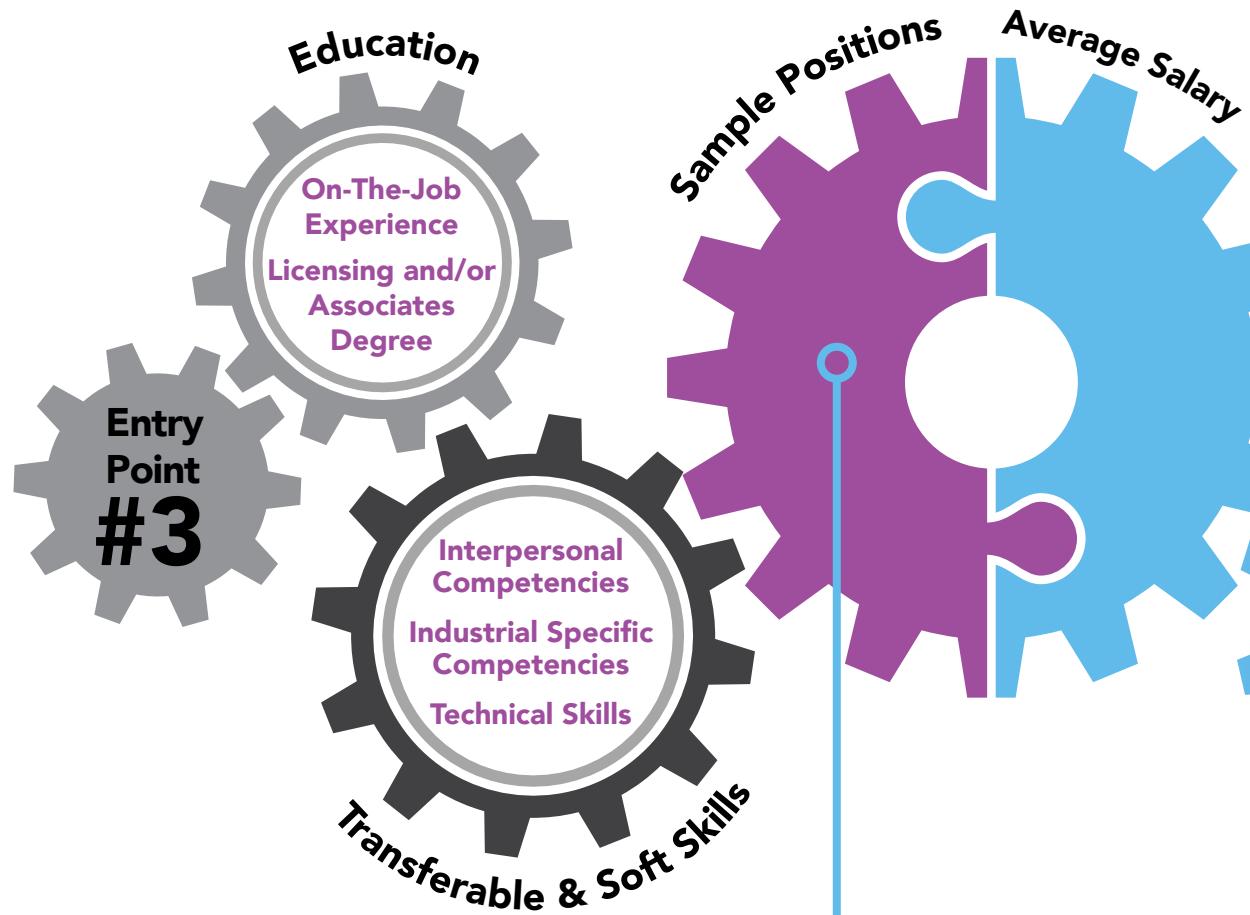
**WAREHOUSE MECHANIC:** Maintains production and quality by ensuring operation of machinery and mechanical equipment.

## LEVEL 3

As you gain more on-the-job experience, licensing, training and/or an associates degree you will have the opportunity to take on more responsibility and will become qualified for more high level positions within the company.

Transferable, soft skills and stackable credentials are also important elements to help you advance your manufacturing career (refer to page 20 for additional information on these skills).

The information provided in "Level 3" provides a sampling of the employment opportunities and associated salary expectations available at this career advancement point. It is important to note that every manufacturing company provides different salary and benefit structures and the information provided is an average industry standard for the region.



### ASSOCIATES DEGREE, CERTIFICATION AND ON-THE-JOB TRAINING

**MECHANICAL DRAFTER:** Develops detailed design drawings and specifications for mechanical equipment, dies/tools, and controls, using computer-assisted drafting (CAD) equipment. Coordinate with and consult other workers to design, lay out, or detail components and systems and to resolve design or other problems.

**ELECTRICAL DRAFTER:** Prepares technical drawings of electrical wiring systems. During the drawing process, they analyze information (such as measurements and sketches) provided by engineers, architects and scientists.

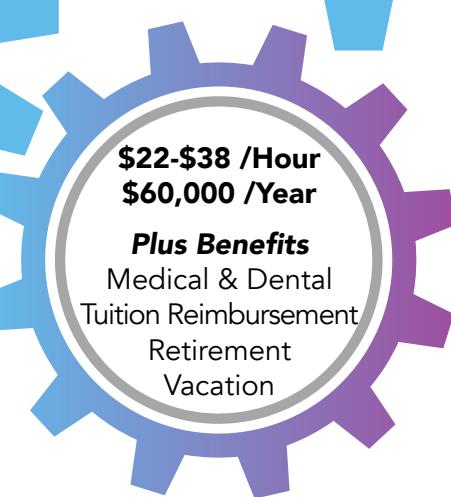
**WELDER II:** Applies appropriate welding techniques and operating various welding devices. More advanced level of joining, fabricating and repairing metal and other weldable materials. Interprets blueprints, diagrams and schematics to determine appropriate welding process.

**CUSTOMER SERVICE:** Addresses customer inquiries via phone, email, mail or social media. Use telephones to reach out to customers and verify account information. Greet customers warmly and ascertain problem or reason for calling.

**CAD DESIGNER:** A CAD or computer-aided design technician utilizes software to create design plans for buildings and machinery. Work in a wide range of industries from engineering and construction to manufacturing.

**LAB MANAGER:** Lab managers bring together their managerial skills and knowledge of safety and lab procedures to ensure that laboratories operate smoothly. Managerial duties generally include scheduling staff, reordering supplies, and maintaining security standards.

## PATHWAYS TO ADVANCEMENT



A variety of advancement opportunities will continue through multiple years of experience and on-the-job training.

Advancement continues if you obtain specialized licensing and/or certification, and/or a 4-Year Degree — with many companies providing tuition reimbursement.

### Consider Moving onto

**Entry Point #4** ➔



**SUPERVISOR:** Responsible for the day-to-day running of the production processes in all types of manufacturing operations. The main duties of a supervisor would include: planning and organizing staff tasks and shift rotations, reporting plant or machinery breakdowns to maintenance technicians.

**MACHINE SET-UP OPERATOR:** Machine Set-up Operators ensure that the machines are working properly and efficiently. This requires extensive knowledge of the machine or machines for which the operators are responsible.

**MAINTENANCE TECHNICIAN:** Responsible for performing highly diversified duties to install, troubleshoot, repair and maintain production and facility equipment according to safety, predictive and productive maintenance systems and processes to support the achievement of the site's business goals.

**QUALITY MANAGER:** Understands customer needs and requirements to develop effective quality control processes. Devises and reviews specifications for products or processes. Sets requirements for raw material or intermediate products for suppliers and monitoring their compliance.

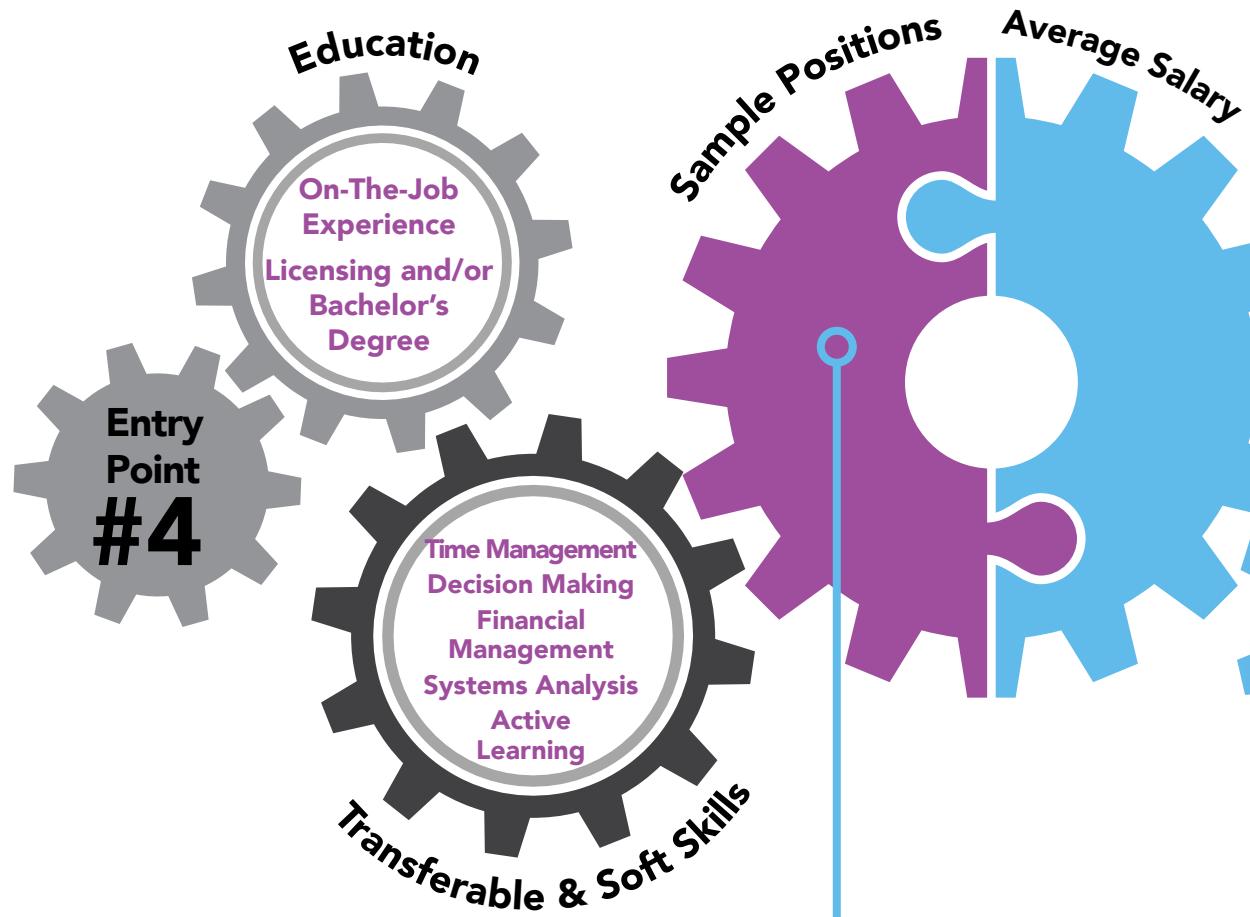
**WEB DESIGNER:** A web designer creates the look, layout, and features of a website, which involves understanding both graphic design and computer programming. Works with development teams or managers for keeping the site up-to-date and prioritizing needs, among other tasks.



## LEVEL 4:

As you gain more on-the-job experience, licensing, training and/or a College Bachelor's Degree you will have the opportunity to take on more responsibility and will become qualified for a variety of highly skilled and management level positions within the company. You will begin to enter the upper levels of salary and benefit opportunities, which can lead to more senior level positions if you demonstrate the leadership qualities often required.

The information provided in "Level 4" provides a sampling of the employment opportunities and associated salary expectations available at this career advancement point. It is important to note that every manufacturing company provides different salary and benefit structures and the information provided is an average industry standard for the region.



### BACHELOR'S DEGREE, CERTIFICATION LICENSING AND ON-THE-JOB TRAINING

**ELECTRICAL ENGINEER:** Evaluates electrical systems, products, components, and applications by designing and conducting research programs; applying knowledge of electricity and materials. Confirm systems' and components' capabilities by designing testing methods and testing properties.

**MECHANICAL ENGINEER:** Design power-producing machines such as electric generators, internal combustion engines, and steam and gas turbines as well as power-using machines, such as refrigeration and air-conditioning systems. Mechanical engineers design other machines inside buildings, such as elevators and escalators.

**OPERATION MANAGER:** Operation Managers are tasked with the supervision and oversight of the daily operations of manufacturing facilities and other related plants. The job consists of managing employees, organizing schedules, meeting performance goals, and other administrative duties.

**GENERAL MANAGER:** Directs, manages, and optimizes the overall operations of one or more plants or other production facilities. Sets policies and makes decisions guiding productivity, quality, and cost efficiency of plant operations.

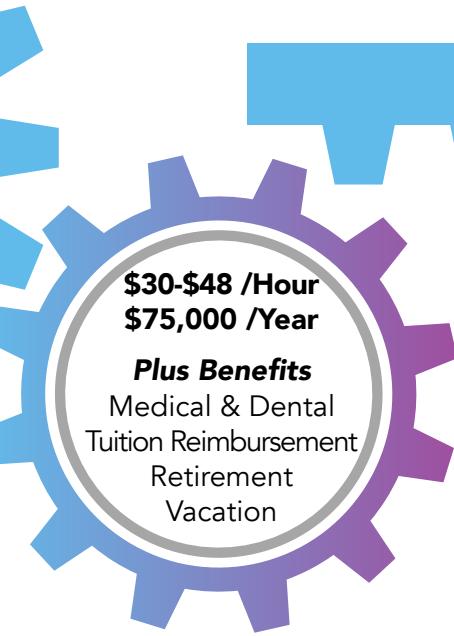
**MATERIALS ENGINEER:** Specialize in metals, plastics or ceramics, and may develop composite materials, or study the atomic structure of materials in order to discover new applications for their mechanical, electrical or chemical properties.

**MACHINE PROGRAMMERS/OPERATORS:** Produces machined parts by programming, setting up, and operating a computer numerical control (CNC) machine; maintaining quality and safety standards; keeping records; maintaining equipment and supplies.

**Advancement continues with additional experience and if you obtain specialized licensing and/or certification.**

**Obtaining a Master's Degree will provide additional advancement to senior level positions potentially generating a \$100,000+ annual salary.**

## PATHWAYS TO ADVANCEMENT



**\$30-\$48 /Hour  
\$75,000 /Year**

**Plus Benefits**  
Medical & Dental  
Tuition Reimbursement  
Retirement  
Vacation

**RESEARCHER:** Using extensive research methodologies, a Researcher performs detailed research in the assigned field, analyzes the gathered data, and presents findings. The researcher plays a vital role in sourcing and extracting valuable market information to benefit the organization.

**SALES MANAGER:** Designs and implements a strategic sales plans that expand a company's customer base and ensure it's strong presence. Manages recruiting, objectives setting, coaching and performance monitoring of sales representatives.

**MARKETING MANAGER:** Managing all marketing for the company and activities within the marketing department. Developing marketing strategy for the company that is in line with company objectives. Coordinating marketing campaigns with sales activities. Planning and implementing promotional campaigns.

**CYBER SECURITY SPECIALIST:** Design firewalls, monitor use of data files, and regulate access to safeguard information and protect the network. Staying up-to-date on current virus reports and protecting networks from these viruses is a major aspect of the job duties.

**PUBLIC RELATIONS MANAGER:** Create and maintain a favorable public image for the company by communicating programs, accomplishments and/or points of view. Public relations managers are tasked with fielding media questions and pitching stories to the media, preparing media kits and organizing press conferences.

**FINANCIAL CONTROLLER:** Responsible for managing all finance and accounting operations associated with the operations of the company.

**HUMAN RESOURCE MANAGER:** Maintains and enhances the organization's human resources by planning, implementing, and evaluating employee relations and human resources policies, programs, and practices.

**COMPUTER TECHNICIAN:** Responsibilities and duties often include installing software or hardware, maintaining and repairing equipment, and configuring computer networks.

**COMPUTER ENGINEER:** Responsible for researching, designing, developing and testing computer hardware and equipment, including chips, analog sensors, circuit boards, keyboards, modems, routers and printers. May work on the manufacturing and installation of these components.

**BUSINESS ANALYST:** Developing technical solutions to business problems, or to advance a company's sales efforts, begins with defining, analyzing and documenting requirements.

**PURCHASING AGENT:** Purchasing agents are analyzers, negotiators and deal-makers. Research, evaluate and buy products for companies to either resell to customers or use in their everyday operations. Often Determine what products get to store shelves, in catalogues, and online.



## SECTION III B

## EDUCATION AND CERTIFICATION TRAINING PROVIDERS

The South Shore has an abundance of educational opportunities throughout the region to address the skill set needs and abilities of all individuals. The region is home to numerous community based organizations with education and training programs to help an individual complete a high school equivalency certificate, English for Speakers of Other Language classes (ESOL), or brush up on basic math, writing and computer skills through Adult Basic Education programs.

The South Shore is also home to several comprehensive high schools, technical high schools and community colleges that provide specific training classes designed to meet the needs of the manufacturing industry.

In addition to these local resources, there are several state-wide industry specific entities that provide certification training for individuals interested in a manufacturing career, as well as for incumbent workers within existing companies.

**The MassHire South Shore Career Center provides training dollars to help individuals access manufacturing education programs. Contact the South Shore Career Center for eligibility requirements and information.**



This section identifies the various education and training programs available and the associated local and regional providers of the programs.

### ACADEMIC AND CURRICULAR PROGRAMMING RELEVANT TO MANUFACTURING SUBSECTORS

Seven important educational institutions exist within the service area of the MassHire South Shore Workforce Board: South Shore Technical High School, Quincy High School, Plymouth South High School, Weymouth High School, Massasoit Community College, Quincy College and Cape Cod Community College. In addition to these local programs there are various state-wide industry-specific entities providing comprehensive training as well. Table 1 identifies the programs at each institution that align with the six largest manufacturing subsectors.

The greatest number of existing educational programs in the South Shore are available in Computers and Electronics, followed by Fabricated Metal Products and Machinery, and Medical Equipment and Supplies. This represents an opportunity for the development of additional programs, especially with industry support, in Computers and Electronics, Paper and Printing, and Chemicals and Plastics (including pharmaceuticals).



**Table 1. Academic and Curricular Programming Relevant to Manufacturing Subsectors**

<b>Advanced Manufacturing Subsector Definitions</b>	<b>South Shore Technical High School</b>	<b>Quincy High School</b>	<b>Plymouth South High School</b>	<b>Weymouth High School</b>	<b>Massasoit Community College</b>	<b>Quincy College</b>	<b>Cape Cod Community College</b>
<b>Chemicals and Plastics (Including Pharmaceuticals)</b>		• Engineering Technology	• Science and Technology/Engineering		• Engineering Transfer Program	• Biotechnology and Compliance • Engineering Technology	• Engineering Technology
<b>Computers and Electronic</b>	• Electronics • Manufacturing Engineering • Technology Electronics	• Engineering Technology • Electrical Technology • Information Technology • Electrical	• Science and Technology/Engineering	• Information Technology • Robotics and Automation Technology • Electronics	• Computer Technology: Programming Option • Computer Repair & Maintenance Certificate • Engineering Transfer Program	• Computer Science: Programming • Web & Mobile Development • Engineering Technology	• Computer Science
<b>Fabricated Metal Products and Machinery</b>	• Drafting • HVAC • Manufacturing Engineering Technology • Metal Fabrication and Welding • Precision Machine Technology	• Metal Fabrication/ Welding Technology • Plumbing Technology		• Metal Fabrication	• Engineering Transfer Program • HVAC Technology • Diesel Technology	• Engineering Technology	• Engineering Technology • Aviation Maintenance Technology • Construction Technology
<b>Food Processing and Production</b>	• Culinary Arts	• Culinary Arts	• Culinary Arts	• Culinary Arts	• Culinary Arts • Food Production • Pastry		• Culinary Arts
<b>Medical Equipment and Supplies</b>	• Engineering Technology • Machine Tool Technology • Manufacturing Engineering Technology	• Engineering	• Science and Technology/Engineering			• Biotechnology and Compliance	• Engineering Technology • Advanced Manufacturing
<b>Paper and Printing</b>	• Design & Visual Communications • Graphic Communications	• Graphic Arts	• Visual Arts	• Graphic Arts	• Engineering Transfer Program • Visual Arts: Graphic Design	• Engineering Technology • Fine Arts: Visual Arts	• Engineering Technology • Fine Arts • Visual Arts



## GED, HiSET AND ADULT BASIC EDUCATION PROGRAMS

The following organizations provide a variety of Adult Basic Education programs to help individuals obtain their high school equivalency (GED/HiSET), as well as ESOL classes. Through the support of the Department of Elementary and Secondary Education (DESE) the programs are generally free for qualified candidates. For specific program information, course schedules and qualification guidelines please contact the institution directly.

### GED/HiSET & Career Pathway Programs

Quincy Community Action Programs (QCAP)  
[www.qcap.org](http://www.qcap.org)  
(617) 479-8181

Plymouth Public Library  
[www.plymouthpubliclibrary.org](http://www.plymouthpubliclibrary.org) also  
[www.plymouthliteracy.org](http://www.plymouthliteracy.org)  
(508) 830-4260

Randolph Community Partnership, Inc.  
[www.rcpinc.org](http://www.rcpinc.org)  
(781) 961-8888

Rockland Public Schools  
[www.rocklandschools.org](http://www.rocklandschools.org)  
(781) 878-3893

Boston Chinatown Neighborhood Center  
Quincy facility  
[www.bcnc.net](http://www.bcnc.net)  
(617) 635-5129

Training Resources of America  
Quincy facility  
[www.tra-inc.org](http://www.tra-inc.org)  
(617) 773-1470

Wellspring Multi Service Center  
Hull facility  
[www.wellspringhull.org](http://www.wellspringhull.org)  
(781) 925-3211

### English for Speakers of Other Languages (ESOL)

Quincy Community Action Programs (QCAP)  
[www.qcap.org](http://www.qcap.org)  
(617) 479-8181

Quincy Asian Resources (QARI)  
[www.quincyasianresources.org](http://www.quincyasianresources.org)  
(617) 472-2200

Boston Chinatown Neighborhood Center  
Quincy facility  
[www.bcnc.net](http://www.bcnc.net)  
(617) 635-5129

Plymouth Public Library  
[www.plymouthpubliclibrary.org](http://www.plymouthpubliclibrary.org) also  
[www.plymouthliteracy.org](http://www.plymouthliteracy.org)  
(508) 830-4260

Randolph Community Partnerships  
[www.rcpinc.org](http://www.rcpinc.org)  
781-961-8888

Training Resources of America  
Quincy facility  
[www.tra-inc.org](http://www.tra-inc.org)  
(617) 773-1470

### Fee based Community College Programs

Massasoit Community College  
[www.massasoit.edu/corporate-and-community-education/](http://www.massasoit.edu/corporate-and-community-education/)  
508-588-9100

Quincy College  
[www.quincycollge.edu](http://www.quincycolllege.edu)  
800-698-1700



## SECTION III C

## APPRENTICESHIP, INTERNSHIPS AND CO-OPS

Literature suggests that manufacturing skills and knowledge acquisition be rooted in 'learning-by-doing' as opposed to strictly formal educational training. Employers favor prospective employees with hands-on training or experience in programs such as apprenticeships, internships, co-ops or mentoring programs. These opportunities help to enhance the pipeline of talented employees by giving students hands-on experience and training, as well as allowing students the opportunity to network with potential employers.

### APPRENTICESHIPS

Apprentice training is a combination of on-the-job training and related instruction (schooling) which has been approved by the Commonwealth of Massachusetts Division of Apprentice Standards (DAS).

Apprentices are considered employees of the company, and thus candidates must meet the minimum qualifications identified by the company. The employer provides on the job learning, performed during the work day under the supervision of a fully skilled employee (mentor, supervisor, journeyman).

Apprentices earn a wage while being given on-the-job training by the company. The Apprentice also receives related instruction by an approved instructor / institution with a minimum of 150 hours required each year.

To learn more about available apprenticeship programs please visit the following:

Commonwealth of Massachusetts  
Executive Office of Labor and Workforce Development  
Department of Labor Standards  
Division of Apprentice Standards  
19 Staniford Street, 2nd. Floor, Boston, MA 02114  
617 626-5409 | [www.mass.gov/lwd/labor-standards/das/](http://www.mass.gov/lwd/labor-standards/das/)

Massachusetts Manufacturing Extension Partnership (MassMEP)  
100 Grove Street, Suite 108, Worcester, MA 01605  
508 831-7020 | [www.massmep.org](http://www.massmep.org)

Greater Boston Manufacturing Partnership (GBMP)  
60 Austin Street, #102, Newton, MA 02460  
617 969-1396 | [www.gbmp.org](http://www.gbmp.org)

### INTERNSHIPS AND CO-OPS

Cooperative Education Employment (Co-op) and Internships provide students the opportunity to leave their school after attending required academic classes or during their designated "shop week", depending on the curriculum model followed, and report to an approved job training site. Participating employers in the region provide advanced on-the-job training that is difficult to receive in a school vocational shop. These programs place students into the workforce allowing them to make connections, network and obtain invaluable real work experiences. The time an individual is participating in an internship or co-op can be paid or unpaid, depending on the arrangement with the company and the length of the internship or co-op.

Many of the comprehensive high schools and community colleges identified in Section III B offer Internships and co-ops in the area of manufacturing. If you are currently enrolled in one of these institutions contact their career development office for specific information and requirements.

If you are not enrolled in a school and are interested in an Internship opportunity contact the MassHire South Shore Workforce Board at (617) 328-7001 for assistance.

## SECTION III D

## SOFT, TECHNICAL AND TRANSFERABLE SKILLS

The necessary level of skill attainment might differ by occupation and manufacturing sector, but employers most often indicate that their employees need an array of soft skills as well as technical knowledge and hands-on experience. Skills such as active listening, critical thinking, speaking, judgment or decision-making, persuasion, negotiation, social perceptiveness, and time management may be just as, if not more, important to many employers as necessary skills in systems analysis, financial management, mathematics, safety, or science and technological training.

Many of these skills are transferable from one career to another, and it is important to self-identify these skills when considering a career in manufacturing. Such basic skills as reading, writing, listening and speaking are often considered just as important as management, research, planning, computer and technical skills. Recognizing things that you are good at such as working with your hands, thinking logically and drawing images can be easily transferable from one type of manufacturing position to another and should not be underestimated.

Manufacturers indicate that these Liberal Arts-based skills are imperative to an efficient and effective workforce. Qualified candidates are those that either have or are eager to attain skills in time management, active learning, active listening, problem solving, judgement and decision-making, and ultimately, critical thinking. The Liberal Arts give students a foundational understanding of processing and assessing information and making informed decisions based on that information. Effective candidates in manufacturing can apply these skills to everyday problems and work collaboratively on solutions and innovations within their fields.



**Effective curricula that match the industry demand for an effective and qualified workforce integrate skills in the following areas:****INTERPERSONAL COMPETENCIES AND VALUES**

Individuals must first demonstrate a foundational level of interpersonal, social, and professional competencies that make them key employees in any workplace. Manufacturing employees are no different here. These candidates must possess basic qualities of professionalism, integrity, responsibility, self-motivation, and dependability. Individuals must be able to engage in dialogue with their colleagues as well as with current and potential clients. In an ever-changing sector of the workforce such as manufacturing, it is also important that these individuals are willing to take initiative, especially with regard to the continued learning of new technologies, techniques, and best practices.

**THINKING AND PROBLEM-SOLVING SKILLS**

A dependable and proactive employee must also possess the skills that allow one to identify problems, come to creative solutions, and implement necessary changes. These types of skills are among those that the Bureau of Labor Statistics, the Office of Labor and Workforce Development, and individual manufacturers suggest are among the most important for the incoming manufacturing workforce.

**ACADEMIC AND TECHNICAL SKILLS**

After a foundational understanding of critical and creative thinking, manufacturing candidates must also have a strong understanding and working knowledge of academic and technical skills that are relevant to STEM fields. This includes skills and experience in reading and writing, mathematics, science, computer technology, and technological literacy. Ideal candidates must have more than a basic understanding of math, science, and computers but they should also have a demonstrated interest in understanding and applying different types of technology to a wide variety of tasks and problems.

**WORKPLACE AND BUSINESS COMPETENCIES**

The ideal, high-quality manufacturing candidate will also have a basic understanding of workplace basics and business practices, according to manufacturing employers. Once again, these skills are built on a foundation of workplace values, of critical thinking and social skills, as well as some content knowledge. Specific skills that manufacturers value include: marketing, customer service, industry sustainability, persuasion and negotiation, financial management, systems analysis and collaboration.

**INDUSTRY-SPECIFIC COMPETENCIES**

The most refined skills that employers seek of their employees are those that are specific to large-scale manufacturing processes and to the manufacturing subsector. Skills in the manufacturing process and design, production, quality assurance, health and safety, and maintenance and repair are key for employees to understand the intricacies of the manufacturing industry. Additionally, a depth of understanding with regard to supply chain logistics and operational control and analysis is preferable. Additional sector competencies may be necessary for an employee works in plastics manufacturing, computer manufacturing, fabricated metal manufacturing, or food processing and production, for example. Training and education for these competencies may be available in higher-level academic programs and/or hands-on job training directly from industry manufacturers.

Additional Skills may be just as, if not more important to many employers as necessary skills.

**And don't worry if you do not have some of the skill sets identified – manufacturers provide on-the-job training, as well as tuition reimbursement to individuals who show the desire, interest and work ethic to advance in a manufacturing career.**



## **Advanced Manufacturing Collaborative**

One Ashburton Place, Room 210  
Boston, MA 02108  
617-788-3610; [masstech.org](http://masstech.org)

Leaders from industry, academia and government help inform, implement and evaluate state policies to support the competitiveness of Massachusetts manufacturers.

## **Cape Cod Community College Aviation Maintenance Technology Program**

Plymouth Municipal Airport  
246 South Meadow Road, Gate 6  
Plymouth, MA 02360  
(508) 375-5062; [capecod.edu/aviation](http://capecod.edu/aviation)

CCCC offers a variety of full-time and part-time options through their Aviation Maintenance Technology Program at the Plymouth Municipal Airport facility.

## **Executive Office of Labor and Workforce Development (EOLWD)**

1 Ashburton Place  
Boston, MA 02108  
617-626-7100; [mass.gov](http://mass.gov)

EOLWD manages the Commonwealth workforce development and labor departments to ensure that workers, employees, and the unemployed have the tools and training needed to succeed in the Massachusetts economy.

## **GBMP**

60 Austin Street #102  
Newton, MA 02460  
617-969-1396; [gbmp.org](http://gbmp.org)

Not-for-profit organization providing customized onsite Lean & Six Sigma training and open-to-the-public Lean & Six Sigma workshops for the manufacturing and healthcare industries.

## **MassHire South Shore Career Centers**

### **Quincy location**

1515 Hancock Street, Suite 100, Quincy  
617-745-4000; [masshiresouthshorecc.com](http://masshiresouthshorecc.com)

### **Plymouth location**

71 R. Obery Street, Plymouth  
617-745-4000; [masshiresouthshorecc.com](http://masshiresouthshorecc.com)

Offer businesses, job seekers and youth access to workforce development services and resources as part of the "One-Stop" Career Center network throughout the Commonwealth.

## **Massachusetts Manufacturing Extension Partnership (MassMEP)**

100 Grove Street, Suite 108  
Worcester, MA 01605  
508-831-7020; [massmep.org](http://massmep.org)

Resources services and support focused on operational excellence, workforce strategies and innovative growth solutions.

## **Massasoit Community College (Middleborough Campus)**

49 Union Street  
Middleborough, MA 02346  
1-800-CAREERS; [massasoit.edu](http://massasoit.edu)

Massasoit Community College has 3 campuses, located in Brockton, Canton and Middleborough, MA. Massasoit offers associate degree programs in arts, sciences, and applied sciences, and one-year and short-term certificates for a range of occupations and interests.

## **MassHire South Shore Workforce Board**

15 Cottage Avenue, Suite 302  
Quincy, MA 02169  
617-328-7001  
[masshiresouthshorewb.com](http://masshiresouthshorewb.com)

Creates connections with local businesses, educational institutions and community partners ensuring the alignment of strategic, market driven, workforce goals and initiatives to support the 22 cities and towns within the South Shore region.

## **Mass Office of Business Development Southeast Regional Office**

200 Pocasset Street  
Fall River MA 02721  
508-673-9783  
[mass.gov/hed/economic/eohed/bd/](http://mass.gov/hed/economic/eohed/bd/)

Central point of contact for businesses looking to expand or relocate to the Commonwealth.

## **Massachusetts Office of International Trade and Investment (MOITI)**

10 Park Plaza, Suite 3730  
Boston, MA 02116  
617-973-8664  
[mass.gov/hed/economic/eohed/moiti](http://mass.gov/hed/economic/eohed/moiti)

Markets and facilitates foreign direct investment in the Commonwealth.

## **MassDevelopment Regional Office-Greater Boston**

1515 Hancock Street, Suite 402  
Quincy, MA 02169  
617-405-5250; [massdevelopment.com](http://massdevelopment.com)

MassDevelopment offers Financing and Real Estate solutions to support companies and non-profits.

**Make it in Massachusetts**  
mamanufacturing.com

**MA Office of Business Development  
Regional Office-South**  
275 Martine Street, Suite 201  
Fall River, MA 02723  
508-6 78-0533; [massdevelopment.com](http://massdevelopment.com)

State finance and development authority acting as both lender and developer with private and public sector clients to stimulate growth, eliminate blight and create jobs.

**MassTech Collaborative Innovation Institute**  
75 North Drive  
Westborough, MA 01581  
508-870-0312; [masstech.org](http://masstech.org)

Supporter of industry-based growth initiatives in the digital economy and the economic structures of underserved regions.

**National Association of Manufacturers**  
733 10th Street NW, Suite 700  
Washington, DC 2000  
202-637-3000  
[nam.org](http://nam.org)

Public-policy advocate for over twelve million manufacturing workers nationwide.

**National Tooling and Machining Association**

1357 Rockside Road  
Cleveland, OH 44134  
800-248-6862; [ntma.org](http://ntma.org)

Industry advocate with nonprofit foundation to support manufacturing education.

**Plymouth South High School**

490 Long Pond Road  
Plymouth, MA 02360  
508-224-7512  
[plymouth.k12.ma.us](http://plymouth.k12.ma.us)

Plymouth South High School is a comprehensive educational facility offering academic and technical studies programs currently serving over 1263 students.

**Quincy College**

1250 Hancock Street  
Quincy, MA 02169  
1-800-698-1700; [quincycollge.edu](http://quincycolllege.edu)

Quincy College is a two-year, municipally affiliated college with campuses located in Quincy and Plymouth, MA. Quincy College offers 37 associate degree programs and 25 certificate programs in a variety of disciplines, including those within Professional Programs, Liberal Arts, Natural & Health Sciences and Nursing.

**Quincy High School**

100 Coddington Street  
Quincy, MA 02169  
617-984-8754  
[quincypublicschools.com/qhs](http://quincypublicschools.com/qhs)

Quincy High School offers courses to meet every student's needs: challenging, advanced courses for college-bound students, technical certification courses, standard courses for all students, remedial courses for students who need additional help and training for students who choose to enter the workforce after graduation.

**Small Business Administration (SBA)**

10 Causeway Street, Room 265A  
Boston, MA 02222  
617-565-8416; [sba.gov/ma](http://sba.gov/ma)

Loans, loan guarantees. Contracts, counseling sessions and other forms of assistance to small business.

**Southeastern Massachusetts Advanced Manufacturing Consortium (SMAMC)**  
[smamc.org](http://smamc.org)

SMAMC is a collaborative group of industry, academia, workforce, and government entities, focused on growing and enhancing advanced manufacturing in the SE Massachusetts region.

**South Shore Technical High School**

476 Webster Street  
Hanover, MA 02339  
781-878-8822; [ssvotech.org](http://ssvotech.org)

South Shore Technical High school provides students with a full academic program based on the Massachusetts Curriculum Frameworks. South Shore offers honors and standard academic programs which prepare students for post-secondary college and career opportunities, and evening courses in manufacturing and welding.

**Weymouth High School**

1 Wildcat Way  
South Weymouth, MA 02190  
781-337-7500  
[weymouthschools.org/weymouth-high-school](http://weymouthschools.org/weymouth-high-school)

Weymouth High School is a comprehensive school offering a ten program Career and Technical Education Department. Students enter the CTE program in 9th grade as they explore each area.





15 COTTAGE AVE, SUITE 302,  
QUINCY, MA 02169

(617) 328-7001  
[MassHireSouthShorewb.com](http://MassHireSouthShorewb.com)