

*Teri Gardner 3-7-22*

March 4, 2022

Washington State Apprenticeship & Training Council  
Attn: Program Manager, Apprenticeship Section  
PO Box 44530  
Olympia, WA 98504

Dear Council Members,

The Machinists Institute is excited to submit the Machinists Institute Career Accelerator (MICA) pre-apprenticeship program for formal recognition with the Washington State Apprenticeship & Training Council. Multiple factors have led to the current workforce shortage that impacts the industries we serve, including Aerospace, Manufacturing, Transportation and Supply chain and more, in their ability to be successful. Qualified workers with skills in welding, machining, assembly, and related positions are at an all-time low and employers desperately need a talent pipeline of skilled workers that meet current and future demand.

According to the current labor trends from the EEOC and the Society for Human Resources Management, the low availability of labor looks to continue for at least another decade. Some predict it to last as long as 15 or more years. This can be blamed on the increased rate of retirements and individuals leaving the workplace due to the pandemic, lack of childcare, a lower birth rate in the U.S. over the past 35 years, lower immigration over the past 5 years, increased production (with fewer bodies), and several other factors.

The time to act is now. Even with offers of high pay, good benefits, and signing bonuses, employers are struggling to find qualified labor to meet production demands. It is time to meet the urgent need to link individuals with resources to help them explore what is available, identify the good-paying earning potential in manufacturing, recognize the pathways to enter these sector careers and connect them with the correct employers and educators to assist them in attaining their goals. MI has connected with business and industry, met with Apprenticeship Coordinators across the state and facilitated advisory board meetings to create a 12-week, 336-hour pre-apprenticeship program designed to offer hands on education that includes certifications in skill areas most beneficial to students and aligned with industry need.

#### **MACHINISTS INSTITUTE OVERVIEW**

The Machinists Institute (MI) is an independent 501(c)(3), licensed to do business in Washington and created by the IAMAW 751 in 2019 to provide world class workforce training for IAMAW

members, Boeing supply chain companies, and employers in the broader communities. MI supports multiple industries including Aerospace, Space, Advanced Manufacturing, Automotive and Heavy-Duty Equipment. Our mission is to provide employer driven education and training for current and future workers to develop a highly skilled and diverse workforce aligned with industry demand. MI has a proven record of accomplishment working with community-based, education and government organizations such as Seattle Job Initiative, Partners in Employment, workforce development councils, Labor & Industry, public school districts and community colleges to drive access to opportunity through education, exploration, employment, and training opportunities.

MI is a statewide program currently providing the Related Supplemental Instruction for the Northwest Machinists Apprenticeship Committee registered occupations. The relationship creates the opportunity to scale programs statewide, develop recognized pre-apprenticeship, registered apprenticeship, and work-based learning opportunities to fit the regional need to expand a sustainable model and grow to other regions. The development of the Machinists Institute Career Accelerator will not only support the needs of our employers and training agents but with the MI emphasis on equity and inclusion this program will focus on access for BIPOC, women, veterans, youth, and those looking for a family sustaining wage and viable career.

### **PROGRAM OVERVIEW**

MICA will be held 3 to 4 times per year based on area need. This 12-week, 240 to 336-hour program will consist of cohorts of 12 to 24 students attending classes. The 240-hour model will be targeted at students working full-time jobs attending classes in the evenings and weekends. The 336-hour program will run 5 days per week for students out of work or working evenings and weekends. The schedule of the program will be developed on the cohort and region to be flexible to various needs across the state.

Students will receive a holistic approach to career exploration that encompasses mental, physical, and emotional health, in addition to web-based and hands-on technical skills training to properly prepare students to be successful in achieving program completion. MI has developed a hybrid model including in-person and web-based learning that begins with 4-weeks of trade EXPLORATION for the industries we represent including Aerospace, Manufacturing and Mechanics. In addition, students will receive employability training *along with* spotlight programming in:

### **Suicide Prevention**

Each year thousands of Americans, like you, are saying “Yes” to saving the life of a friend, colleague, sibling, or neighbor. Training includes:

- QPR Gatekeeper is a 1-hour session covering how to Question, Persuade and Refer someone who is suicidal, the common causes of suicidal behavior, the warning signs and how to get help for someone in crisis.

- Resilience & Thriving is a 2-hour session covering how to identify stress/stressors/triggers, good vs bad coping skills, strategies to move from Coping to Resilience to Thriving and gives an overview of the Six Dimensions of Wellness.

### **Mentorship Matters**

The Mentorship Matters™ on-the-job mentoring program teaches communication skills that make the workplace more effective and more efficient. Having a structured mentorship system is a key component of an effective workforce development strategy. Never has this been more critical than today, with the vast numbers of workers moving to retirement and a broad base of young diverse workers joining the workforce — particularly in apprenticeship programs where 80% of learning takes place on the job.

Targeted at early learners, this workshop provides pre-apprentices with skills and strategies for success in both technical training and on the jobsite. Participants will:

- Learn effective communication strategies, including intergenerational communication strategies, to maximize on-the-job learning opportunities
- Identify various learning styles and associated strategies to gain the most from verbal and practical instruction
- Understand and implement goal-setting techniques to enhance training

### **Financial Literacy**

Participants in pre-apprenticeships have a lot to learn. Not only are they acquiring new job skills, but it may be the first time they will be offered benefits or earn a substantial paycheck in a full-time career.

Financial Literacy will help pre-apprentices prepare to build a solid financial foundation. It highlights the issues they should consider as they are getting started in their jobs and provides helpful tips for the future. MICA students will receive Financial Literacy training covering the following, but not limited to:

- Financial SMART Goals
- Budgeting and Organizing Your Finances
- Financial Pitfalls and Stretching Your Income
- Understanding Credit and Debt
- Creating a Debt Repayment Plan

Arrangements will be made with local financial institutions including banks and credit unions to provide the training. Where this is not possible, this training will be delivered online.

## **Digital Literacy**

MICA will provide digital literacy programming through Northstar Digital Literacy on-line platform. Northstar Digital Literacy defines basic skills needed to perform tasks on computers and online. Online, self-guided modules assess the ability of individuals to perform tasks based on these skills. Included are basic computer digital literacy standards and modules in three main areas:

- **Essential Computer Skills** - Basic Computer Skills, Internet Basics, Using Email, Windows OS, Mac OS
- **Essential Software Skills** – Microsoft Word, Excel, PowerPoint, Google Docs
- **Using Technology in Daily Life** - Social Media, Information Literacy, Career Search Skills, Supporting K-12 Distance Learning, Your Digital Footprint.

## **Physical Fitness**

Realizing the importance of being physically fit to perform the duties of lifting, reaching, bending, pushing, MICA students will participate in the following:

- Daily stretching and conditioning for 15 minutes per day prior to entering the lab
- Attend a Nutrition and Well Being workshop to address how to properly fuel the body for extended periods of standing, lifting and working under strenuous conditions

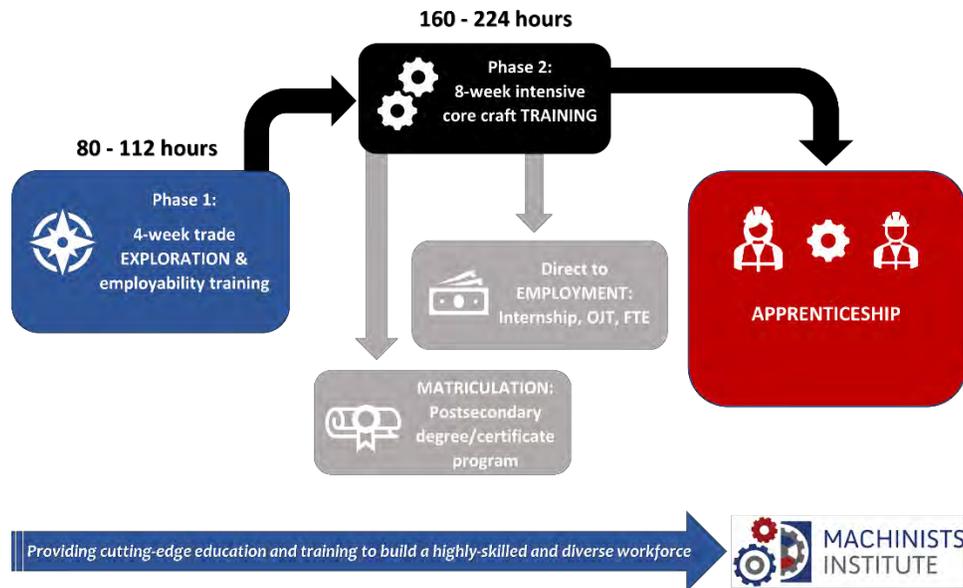
After completing the 80-hour or 112-hour EXPLORATION phase of the MICA Pre-Apprenticeship Model, students will enter Phase 2 consisting of 8 weeks (160 hours or 224 hours) of intensive core craft TRAINING for two pathways. One pathway will focus on Aerospace and Manufacturing and will include the web-based SME ToolingU Certified Manufacturing Associate (CMfgA) Certification consisting of 25 training modules and two additional NIMS Modules in Manual Lathe and Mill Operations. The CMfgA Certification is an industry certification focused on basic manufacturing concepts, demonstrating an individual's potential for high-demand, entry-level manufacturing roles. Covering fundamental topics such as shop math, assembly, maintenance, machining, inspection, introduction to robotics, introduction to computer numerical control (cnc), and more, this industry-driven certification demonstrates that the individual has basic knowledge of manufacturing and may be an ideal candidate for entry-level manufacturing employment. Utilizing this hybrid model will allow students to work on-line and in the lab with options to enter straight into employment, advance into a registered apprenticeship or continue their education at the post-secondary level.

The second pathway will focus on the mechanics pathway with introduction to basic engine mechanics, introduction to systems, diesel and more. Additional certifications such as forklift and the content align with curriculum that leads to industry recognized ASE (Automotive Service Excellence) certification.

For both pathways, the content that includes safety, basic employability skills, basic communication skills, and introduction to trade math aligns with the first quarter RSI (Related Supplemental Instruction) of the Northwest Machinists Apprenticeship Committee apprenticeship programs. This will allow for advanced standing and prior credit for students upon being accepted into an apprenticeship program.

The Machinists Institute has partnered with Seattle Jobs Initiative to adapt current Soft Skills training being utilized by other successful union programs to target and address the manufacturing industry. Modules include Personal Growth, Goal Setting, Making the Most of Feedback, Non-Verbal Communication and more. With exposure to soft skills and digital literacy, MICA students will have a foundation to braid these skills with resume writing, interview techniques and networking for job placement. Preparing students for real world work environments is necessary for skilled workers to not only find employment but also to maintain employment past the first 90 days. It is imperative that we give MICA students the tools they need to be successful in this rapidly changing industry.

## Pre-Apprenticeship Model



### ELIGIBILITY AND APPLICATION PROCESS

An application and orientation will be required with the Student Affairs Specialist or Site Director prior to being accepted into the program. The interview process is focused on helping students understand the program, qualifications, and expectations, while allowing students to discuss and

request support services needed to successfully complete the program. MI is committed to student success and recognizes there are many factors that can impede students' progress. To mitigate barriers MI actively works with community based organizations and applies for funding that will ensure students access resources they need to be successful, including areas such as childcare, transportation, equipment and more.

In addition to the minimum and preferred qualifications, students are expected to be physically capable of doing the work, show up on time every day, have reliable transportation, be respectful of yourself and others, show up ready to learn and maintain a positive attitude.

**COVID-19:** students will be required to follow MI safety procedures, including those for Covid-19 compliance.

### **EVALUATION AND PROGRAM COMPLETION**

ToolingU provides pre-exams, coursework, and final exams for each of the 25 classes within the CMfgA certification which can be accessed and reviewed by both the instructor and the student. Pre-tests are set at a minimum pass rate of 75% to raise the bar and make achieving a 70% final CMfgA exam score more attainable. The goal of MICA is to train and produce a skilled pipeline of Certified Manufacturing Associates (CMfgA) with certifications in hand to present to their future employer. Students are required to:

- Pass SME's CMfgA Certification Exam at 70% (for Aerospace/Manufacturing pathway)
- Complete a Capstone Project
- Complete all Quizzes and Exams administered throughout the program
- Participate and complete lab assignments and activities
- Regular and timely attendance

### **MARKETING AND RECRUITMENT**

MI has established partnerships with education, workforce development and community service organizations to assist in the recruitment process. Working closely with the Workforce Development Councils, WA State Public Schools, Labor Councils, Community Partners, and the Machinists Institute Business Development and Student Affairs staff to create and market a pipeline of individuals.

Recruitment will focus on women, people of color, underrepresented populations, at-risk youth, re-entry, displaced workers, and veterans. MI approaches outreach and recruitment with an emphasis on equity and access. Our marketing strategy and visuals demonstrate that commitment as well as our partnerships with other programs such as ANEW, Partners in Employment, iUrban Teen, CAMPS and more.

## **SUPPORT SERVICES AND PROGRAM NAVIGATION**

MI has hired an Apprenticeship and Student Affairs Specialist to assist with recruitment of potential candidates and retention of students and apprentices throughout their entire experience. The Apprenticeship and Student Affairs Specialist is responsible for serving as a liaison between the pre-apprentices and the program ensuring all their needs are met regardless of the circumstance. They will also assist with community engagement and outreach, offering the opportunity to enrich individuals with skills and training to create a better future for themselves, their families, and society.

Services will include barrier removal, supportive services, education goals, employment preparation, childcare navigation, and placement opportunities.

## **PRE-APPRENTICESHIP AND BEYOND**

The Machinists Institute is working to expand and enhance opportunities beyond pre-apprenticeship to include:

- Working with Community Colleges, High Schools and Skill Centers to create dual credit career pathways for youth
- Developing partnerships with business and industry for immediate employment and registered apprenticeship opportunities
- Exposing students to Community College, Career Technical College and University degree program educational advancement opportunities

Respectfully,



Shana Peschek  
Executive Director  
Machinists Institute  
9125 15th Place S  
Seattle, WA 98108

**Northwest Machinists Apprenticeship Committee**  
9135 15<sup>th</sup> Place South, Seattle, WA 98108  
(206) 762-7990

AN

Teri Gardner 3-7-22

**Northwest Machinists Apprenticeship Committee Articulation Agreement the *Machinists Institute Career Accelerator* Pre-Apprenticeship Program**

The Northwest Machinists Apprenticeship Committee (NMAC) is committed to strategies that will support the development of a diverse and skilled talent pipeline with access into family sustaining wages and career growth. The *Machinists Institute Career Accelerator (MICA)* is a pre-apprenticeship program that works with NMAC, Labor, WA State Community and Technical Colleges, K12 partners, Workforce Development Councils, Community based organizations and employers to create opportunities, access and awareness of the careers and support individuals' choices for pathways into the occupations.

This articulation agreement includes the below commitments:

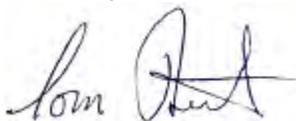
- Recognition of the program curriculum content in alignment with the registered apprenticeship program for purposes of 5 credits towards Related Supplemental Instruction if/when student is accepted and completes their apprenticeship.
- Interview opportunities and advanced standing in the application process. Advanced standing, extra points during the interview process.
- Continual review of program to ensure content is in alignment and relevant with industry technology and practices.
- Participation with and support of program through job site tours and class speakers, resume review and mock interviews.

The Northwest Machinists Apprenticeship Committee voted and approved the articulation agreement with the Machinists Institute Career Accelerator Program. The Northwest Machinists Apprenticeship Committee is excited about this program and the opportunity to provide access and opportunity to the industries we represent.

With the goal of providing training in occupations that provide a sustainable living wage, and a focus on providing opportunity to BIPOC, women, veterans, youth, and those in search of the right career fit, the Machinists Institute Career Accelerator pre-apprenticeship program is on point to create a pipeline of diverse and skilled talent in an ever-changing competitive market.

We support the Machinists Institute Pre-Apprenticeship Program application submittal without reservation and look forward to a long-lasting partnership. Please feel free to contact us with any questions or concerns.

Sincerely,



2/18/22

Tommy Hunt  
Northwest Machinists Apprenticeship Committee  
tommy@iam160.com  
253-304-6313



Rec 03/04/2022 AN

# AEROSPACE MACHINISTS INDUSTRIAL DISTRICT LODGE 751

9125 - 15TH PLACE SOUTH  
SEATTLE, WASHINGTON 98108-5100

FAX NUMBER  
EXECUTIVE OFFICE (206) 764-0303  
FINANCIAL OFFICE (206) 764-0358  
www.iam751.org

SEATTLE (206) 763-1300  
RENTON (425) 235-3777  
EVERETT (425) 355-8821  
AUBURN (253) 833-5590

JON HOLDEN  
District President  
Directing Business Representative

RICHARD E. JACKSON  
District Secretary-Treasurer

February 21, 2022

WSATC Board Members and  
Apprenticeship Application Reviewers

Re: Letter of Support for the *Machinists Institute Career Accelerator*  
Pre-Apprenticeship Program Recognition

Please accept this letter of support for the Machinists Institute Pre-Apprenticeship Program Recognition application as a state-recognized pre-apprenticeship program. IAM District 751 created the Machinists Institute to support the workforce needs of the industries we represent. We are committed to strategies that will support the development of a diverse and skilled talent pipeline with access into family sustaining wages and career growth. The *Machinists Institute Career Accelerator (MICA)* is a pre-apprenticeship program that works with WA State Community and Technical Colleges, K12 partners, Workforce Development Councils, Community-based organizations and employers to create opportunities, access and awareness of the careers and support individuals' choices for pathways into the occupations. MICA has already taught three cohorts of classes in partnership with Partners in Employment, a community-based organization that supports the refugee and immigrant community in South Seattle. This has been very successful in giving students an opportunity to learn skills in a hands-on environment and tour job sites. One student has already been enrolled in a community college program and has decided he wants to instead pursue an apprenticeship and career in manufacturing.

With the goal of providing training in occupations that provide a sustainable living wage, and a focus on proving opportunity to BIPOC, women, veterans, youth, and those in search of the right career fit, the Machinists Institute Career Accelerator pre-apprenticeship program is on point to create a pipeline of diverse and skilled talent in an ever-changing competitive market.

We support the Machinists Institute Pre-Apprenticeship Program application submittal without reservation and look forward to a long-lasting partnership. Please feel free to contact me with any questions or concerns at (206) 764-0302 or JonH@iam751.org.

Sincerely,

Jon Holden  
District President and  
Directing Business Representative  
IAM&AW District Lodge 751



## INTERNATIONAL ASSOCIATION of MACHINISTS and AEROSPACE WORKERS DISTRICT LODGE No. 160

9135 15TH PLACE SOUTH · SEATTLE, WASHINGTON 98108  
(206) 762-7990 · FAX (206) 764-0468

AFFILIATED LODGES: 79 – 130 – 282 – 289 – 297 – 695 – 1690 – 2379

PAUL MILLER, Directing Business Representative

THOMAS BURKE, President

JOHN W. DECKER, Secretary-Treasurer

2/24/2022

Re: Letter of Support for the *Machinists Institute Career Accelerator* Pre-Apprenticeship Program Recognition

Dear WSATC Board Members and Apprenticeship Preparation Application Reviewers:

Please accept this letter of support for the Machinists Institute Pre-Apprenticeship Program Recognition application as a state-recognized pre-apprenticeship program. IAM 160 has been working closely with the Machinists Institute to support the workforce needs of the industries and employers we represent. We are committed to strategies that will support the development of a diverse and skilled talent pipeline with access into family sustaining wages and career growth. The *Machinists Institute Career Accelerator (MICA)* is a pre-apprenticeship program that works with WA State Community and Technical Colleges, K12 partners, Workforce Development Councils, Community based organizations and employers to create opportunities, access and awareness of the careers and support individuals' choices for pathways into the occupations.

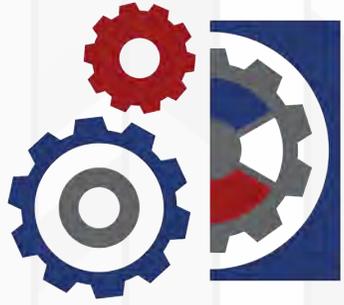
MI has already developed partnerships and articulations with K12 entities and provided the opportunity for summer work-based learning opportunity with one of our signatory employers. That student was so successful both the employer and the student want to continue into full time employment once he completes his high school education.

With the goal of providing training in occupations that provide a sustainable living wage, and a focus on providing opportunity to BIPOC, women, veterans, youth, and those in search of the right career fit, the Machinists Institute Career Accelerator pre-apprenticeship program is on point to create a pipeline of diverse and skilled talent in an ever-changing competitive market.

We support the Machinists Institute Pre-Apprenticeship Program application submittal without reservation and look forward to a long-lasting partnership. Please feel free to contact us with any questions or concerns.

Sincerely,

Bonnie Kosten  
IAM District 160  
bonnie@iam160.com  
253-229-0029



MACHINISTS  
INSTITUTE

Rec 03/04/2022

*AN*

*Teri Gardner 3-7-22*

# MI CAREER ACCELERATOR

# TUKWILA TRAINING CENTER



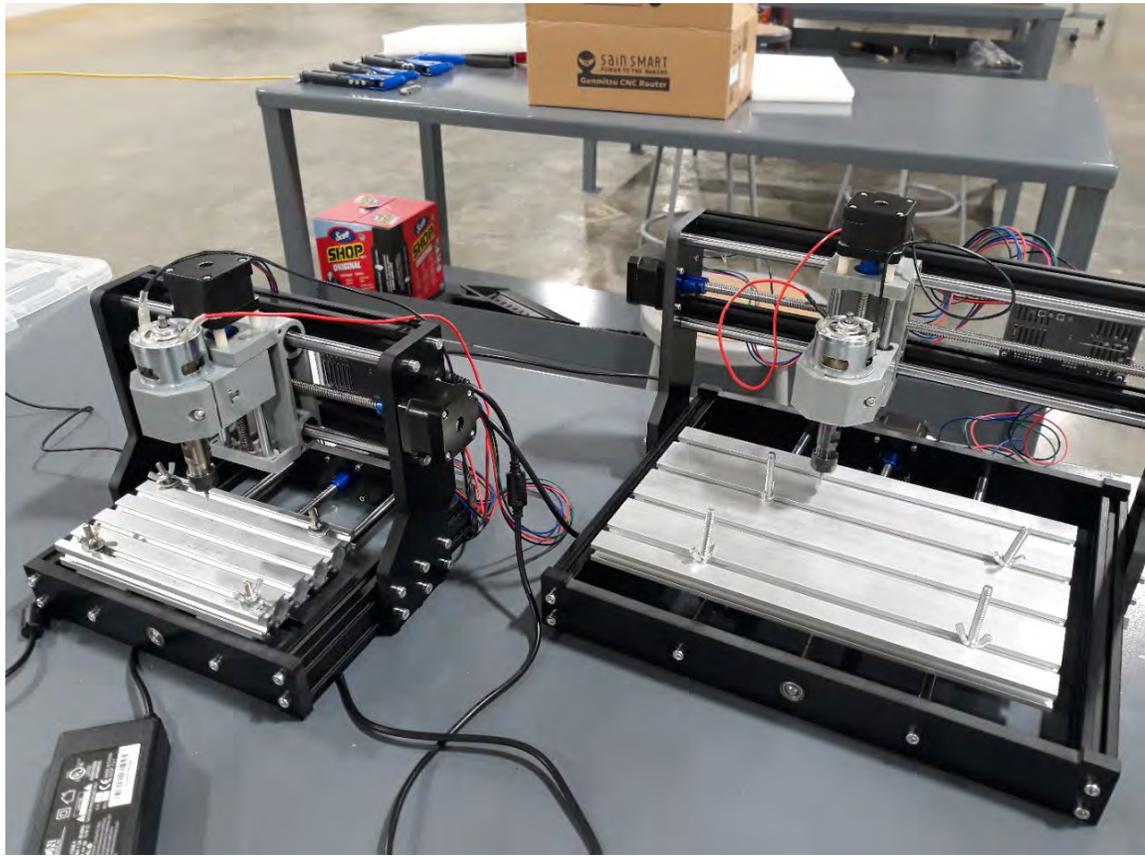
# COLLABORATION WITH PARTNERS IN EMPLOYMENT

MI offered the course to two cohorts August 2021 to December 2021.

**Due to the success of these two cohorts, PIE approached MI about offering a third cohort beginning at the end of January 2022 and running for 10 weeks, ending March 2022.**

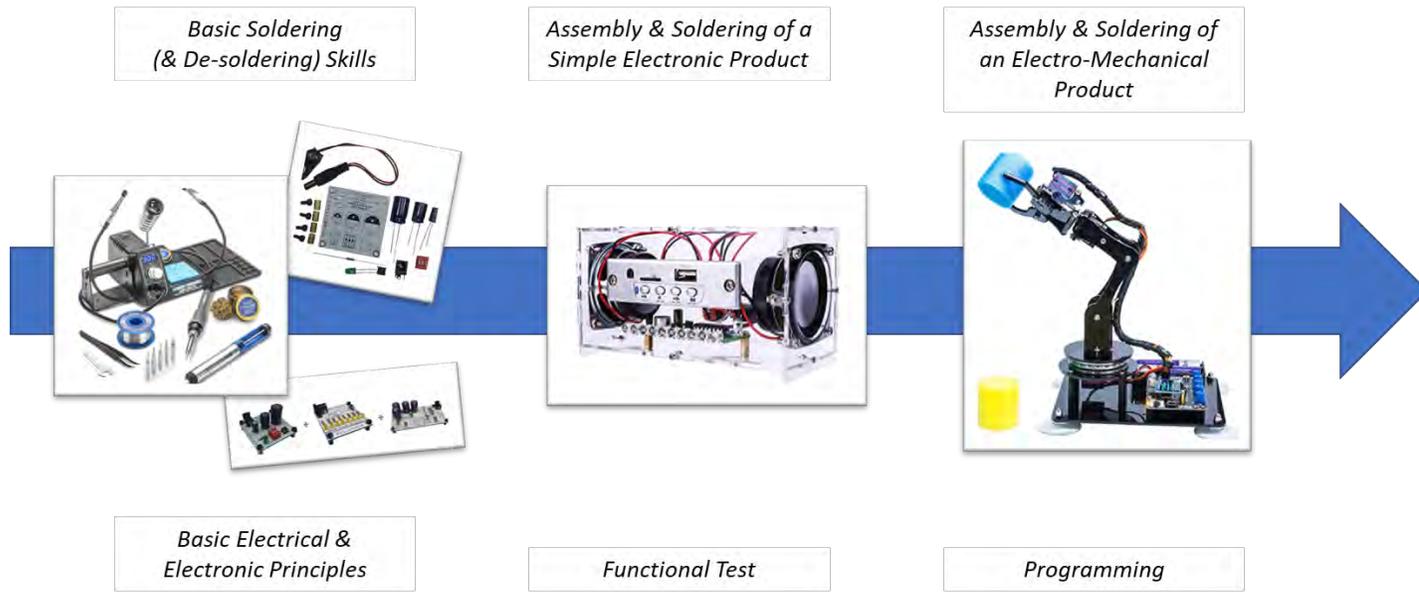
Partners in Employment (PIE) serves the immigrant and refugee community in South Seattle

This program served high school age students and paid them a stipend, covered costs of food, equipment and transportation during the program.



# COURSES

These cohorts focused/are focusing on career pathways within the aerospace and advanced manufacturing industry. Specific goals and metrics with any youth training program, especially in this industry sector, is to provide the students with as many hands-on experiences as possible, for students will gain skills quicker when they can apply what they have learned in the classroom into a lab setting. We have been able to accomplish that with various pieces of equipment in the lab that students are able to use for practice projects. Also, we wanted to ensure that what students were experiencing in the lab they were able to see out on actual shop floors. During these cohorts, students were able to take several industry tours and get firsthand knowledge of what a shop floor is like. Throughout the course of this 8-month partnership, MI has been able to expand the curriculum within the lab, adding electronics and the ability to program G-code into the computer which then told the CNC router what to cut out on metal strips. The students had a great time doing that, with some unique and intricate designs being made.



**1) Soldering & Electronics Basics**

Using custom training boards, students are introduced to soldering and de-soldering skills, and are also taught about basic electrical concepts such as voltage, current, resistance, capacitance ...

**2) Soldering Project (Bluetooth Speaker)**

Soldering and assembly skills are exercised in the assembly of a simple electronic device, which is then tested to see if it is functional.

**3) Soldering, Assembly & Programming Project (Robot)**

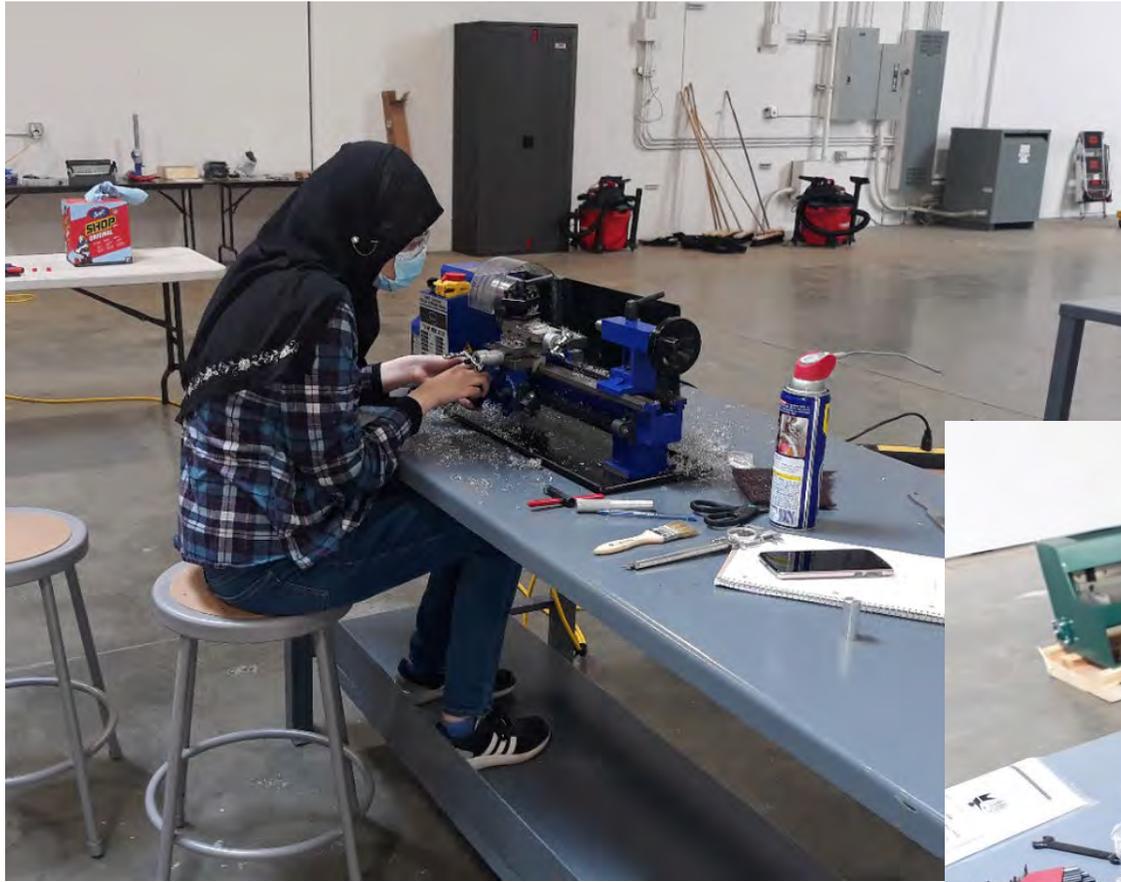
The skills learned in the previous phases are extended to the assembly of an electromechanical device such as a robotic arm. Advanced students will also be able to progress to programming of the device.



# DEMOGRAPHICS

Throughout these three cohorts, MI and PIE saw the following numbers:

- Number of total students: 29
- Number of Females: 14 ; Number of Males: 12
- Ethnicity: African Americans; Asian, and Middle Eastern



# HIGHLIGHTS

We were running these courses prior to having an approved registered apprenticeship for articulation, however we have several success stories. Here are a couple of those student highlights:

- This student had some shop experience that he attained while in high school. He was quick to pick up the techniques working with cutting and shaping metals and at one point pulled the instructor over to show him a “cool trick he learned to minimize the markings left by the chuck on the workpiece.” He then proceeds to demonstrate to the other students how Styrofoam creates a buffer to reduce the scratches and/or gouges formed by tightening a workpiece on a lathe. His enthusiasm for the manufacturing processes, his creativity and ingenuity in finding a simple yet effective technique to improve surface finish, and his ability to transfer his knowledge and skills to others through demonstrations and teaching.
- Several students showed development in confidence in multiple areas including math, measurement and use of hands on equipment.
- During one of the cohorts, we found out we had a student that was working nights at Safeway and then right to the pre-employment program. He was usually very exhausted but continue to persevere and work through his struggles. He spoke to our instructor and expressed interest in participating in a pre-apprenticeship program through one of our industry partners or possibly changing jobs and applying to another industry partner. MI staff have been working with our industry contacts to assist him with the transition into manufacturing.
- One student was enrolled in a Community and Technical college program, after taking our course he discovered he had a passion for manufacturing and is working with our instructor on transitioning into employment/apprenticeship.
- We placed a student with one of our signatory employers for Heavy Duty Equipment Mechanic for a summer internship, they were so impressed with him they are working to open an apprenticeship slot for him



## Certified Manufacturing Associate (CMfgA) Certification Curriculum Overview

*Teri Gardner 3-7-22*

### Intro to OSHA 101

#### Safety

Intro to OSHA provides an introduction to the purpose of OSHA and how its standards and guidelines affect employers and employees. Most U.S. workplaces are covered by OSHA, and its existence has greatly improved workplace safety. Some industries are not covered by OSHA, however, and some states have safety programs that take the place of OSHA. OSHA standards are enforceable by law. Compliance with OSHA standards is enforced by inspections and record keeping, which have specific steps and requirements. Employers and employees have different rights and responsibilities regarding OSHA standards. Both employers and employees benefit from basic knowledge about OSHA's purpose, standards, and practices. Violations of OSHA standards are punishable by law and render the workplace unsafe for all personnel. A basic awareness of the standards, rights, and responsibilities will help employees to bolster workplace safety as well as keep the workplace legally compliant.

### Personal Protective Equipment 111

#### Safety

The class Personal Protective Equipment introduces the purpose and uses of personal protective equipment (PPE). As defined by the Occupational Safety and Health Administration (OSHA), PPE minimizes exposure to hazards and helps prevent injury. In order to select appropriate PPE, employers must first evaluate the workplace with a hazard assessment. PPE may be categorized by the area of the body it protects. PPE is available in several types, designs, and materials. Every employer is responsible for providing the appropriate PPE for workers who require it, and it is every employee's responsibility to properly wear and use PPE. OSHA does not often specify which types of PPE should be worn, but requires that employers train each employee in proper use and retrain when PPE changes or if PPE is used improperly. After taking this class, users should be able to describe OSHA regulations regarding personal protective equipment and how they impact day-to-day operations in the workplace.

### SDS and Hazard Communication 151

#### Safety

The class Personal Protective Equipment introduces the purpose and uses of personal protective equipment (PPE). As defined by the Occupational Safety and Health Administration (OSHA), PPE minimizes exposure to hazards and helps prevent injury. In order to select appropriate PPE, employers must first evaluate the workplace with a hazard assessment. PPE may be categorized by the area of the body it protects. PPE is available in several types, designs, and materials. Every employer is responsible for providing the appropriate PPE for workers who require it, and it is every employee's responsibility to properly wear and use PPE. OSHA does not often specify which types of PPE should be worn, but requires that employers train each employee in proper use and retrain when PPE changes or if PPE is used improperly. After taking this class, users should be able to describe OSHA regulations regarding personal protective equipment and how they impact day-to-day operations in the workplace.

### Bloodborne Pathogens 161

#### Safety

The class Bloodborne Pathogens explains the nature of common bloodborne pathogens and how to handle exposure in the workplace. A bloodborne pathogen is a microorganism present in human blood that can cause disease. Common pathogens include HIV, which causes AIDS, HBV, which causes hepatitis B, and HCV, which causes hepatitis C. Exposure to

blood can occur in the workplace through work-related tasks and procedures, through accidents, or by administering first aid. To avoid exposure, workers should observe the universal precautions recommended by the CDC. Employers are required by OSHA to implement controls to minimize exposures in the workplace. Employees who understand how to protect themselves from bloodborne pathogen exposure make the workplace safer for everyone and benefit their employer. After taking this class, users should be able to describe OSHA regulations regarding bloodborne pathogens and how they impact day-to-day operations in the workplace.

## **Ergonomics 102**

### **Safety**

The class Ergonomics provides an overview of the science of ergonomics and its application in the workplace. Ergonomic hazards may be present in any work environment and are a common safety risk. Not all ergonomic risks are apparent, but they can still cause musculoskeletal disorders (MSDs). Vibration, poor posture or positioning, and repetitive motion are common ergonomic hazards, though back injuries are the most common workplace injuries. The majority of work-related back injuries are caused by unsafe lifting techniques. Even computer tasks can cause MSDs over time. Ergonomic solutions should be tailored to the individual employee performing the job or task. Ergonomic programs are an effective way for any employer to increase employee safety, decrease injury and illness, reduce sick time, boost employee morale, and reduce turnover rates. Implementing proper ergonomics in the workplace increases productivity and reduces the cost of sick leave and new employee training.

## **Fire Safety and Prevention 181**

### **Safety**

The class Fire Safety and Prevention examines common workplace fire safety procedures. Fires, no matter how small, should be reported immediately. Buildings are equipped with extinguishing systems that actuate an alarm and discharge an extinguishing agent to control advanced stage fires. Portable fire extinguishers are available for extinguishing incipient stage fires using the P.A.S.S. technique. Employees not authorized to fight the fire should evacuate immediately. Employers should create an emergency action plan that dictates the procedures to be carried out in the event of an emergency. In the event of a fire, employees should stay calm, follow procedures, and go directly to assembly areas. Employers must account for all employees and provide first aid until medical services arrive. After taking this class, users will be able to describe OSHA regulations regarding fire safety and how they impact day-to-day operations in the workplace.

## **Math Fundamentals 101**

### **Shop Essentials (Applied Mathematics)**

The class Math Fundamentals covers basic arithmetic operations, including addition, subtraction, multiplication, and division. Additionally, it introduces the concept of negative numbers and integers. The class concludes with an overview of the order of operations and grouping symbols. Basic mathematical operations are the foundations upon which all math relies. Mastery of these foundational tasks will ease a student into more complicated mathematics, such as algebra and geometry, both of which are commonly used in a variety of manufacturing environments.

## **Math: Fractions and Decimals 111**

### **Shop Essentials (Applied Mathematics)**

Math: Fractions and Decimals provides the methods used to perform basic mathematical operations using fractions, decimals, and percentages. The class covers addition, subtraction, multiplication, and division with fractions and decimals. It also discusses conversions between fractions, decimals, mixed numbers, and improper fractions. Almost any manufacturing print uses fractions and decimals in its measurements. Knowing how to handle these numbers and convert between them is an essential part of the basic skills needed to work in a manufacturing environment.

## **Units of Measurement 112**

### **Shop Essentials (Applied Mathematics)**

The class Units of Measurement provides a thorough explanation of the English and Metric systems and how conversion between them occurs. The common base units of measurement are length, area, volume, mass, and temperature. The English system uses inches, feet, yards, and miles to measure length, while the Metric system uses the meter, millimeter, centimeter, and kilometer. Metric conversion requires simply knowing the equivalent number of units and moving the decimal point accordingly. When converting between Metric and English units, use a reference chart, multiply, or divide, depending on the conversion. Units of measurement are used every day in a production environment. Converting between units is often required, especially for businesses dealing internationally. After taking this class, users should be able to perform calculations involving common English units, metric units, and conversions between the two systems.

## **Basic Measurement 101**

### **Inspection**

The class Basic Measurement offers an overview of common gaging and variable inspection tools and methods. Variable inspection takes a specific measurement using common devices such as calipers and micrometers. The sensitivity of the instrument must be greater than the measurement being taken. Both calipers and micrometers are read by finding the alignments in lines on the devices. Gages, such as gage blocks, plug gages, ring gages, and thread gages, reveal whether a dimension is acceptable or unacceptable without a specific quantity. All inspection devices should be properly mastered and maintained to retain accuracy. One of the fundamental activities of any shop is the measurement of part features. Consistent measurement and inspection maintains standardization and ensures that out-of-tolerance parts do not reach customers. After taking this class, users should be able to describe the use and care of common inspection instruments and gages used in the production environment.

## **Basics of Tolerance 121**

### **Inspection**

Basics of Tolerance provides a comprehensive overview on part tolerancing, including different types of tolerances and the relationship between tolerances and part dimensions. Every manufactured part must meet certain specifications. Tolerances describe the range of acceptable measurements in which a part can still perform its intended function. Tolerance ranges typically describe a linear measurement. Surface texture can require a certain tolerance as well. Tolerances attempt to balance the use of a product with the cost required to produce that product. Improper tolerancing can result in parts that do not function in the way they were intended or parts produced with dimensions that are more precise than necessary, adding unwanted cost to production. After the class, users will be able to describe common methods used for part tolerancing, as well as the impact tolerances have on part production and quality.

## **Blueprint Reading 131**

### **Inspection**

The class Blueprint Reading provides a thorough understanding of blueprints and how to read them. Blueprints are documents that contain three major elements: the drawing, dimensions, and notes. The drawing illustrates the views of the part necessary to show its features. Together, the extension and dimension lines on the drawing indicate dimensions and specific tolerance information of each feature. The notes contain administrative and global information about the part. A blueprint contains all instructions and requirements necessary to manufacture and inspect a part. An understanding of how to read a blueprint is critical to manufacture and inspect parts to accurate specifications. Accurate blueprint creation helps to ensure that finished parts will function in a way that meets the original intent. After taking this class, users should be able to read a basic blueprint and determine the critical features on a part that need to be measured.

## Hand and Power Tool Safety 201

### Safety

The class Hand and Power Tool Safety provides guidelines for the safe use of common hand and power tools. Employees should never remove any safety guards from a tool's point of operation unless authorized. Tools must be regularly cleaned and maintained, and all blades must be kept sharp. The worksite must be kept organized, clean, and dry. All tool applications require PPE, including eye and other protection. Before working, employees must consult the owner's manual and be familiar with how the tool functions. Employees must also use the right tool for the job and follow the work practices that are specific to each type of tool. When employees use proper safety guidelines when handling hand and power tools, their employers benefit from reduced accidents on the job and lowered costs caused by work-related injuries. Safe handling of tools also increases work quality. After taking this class, users should be able to describe the safe use and care of hand and power tools.

## Introduction to Assembly 101

### Fasteners

The class Introduction to Assembly provides an overview of the processes and methods used to assemble components into finished parts. Assembly is often performed on assembly lines, which may be manual, automated, or a combination of both. The three main assembly methods are mechanical fastening, adhesive bonding, and welding. Mechanical fastening uses fasteners to join components. Fasteners can join dissimilar materials, are inexpensive, and allow for disassembly. Adhesive bonding uses materials such as gels, liquids, or tapes to form a joint. Welding uses pressure, heat, or a combination of energy sources to create a very strong, permanent joint. These methods are sometimes used together. The information presented in this class serves as a foundation for users to learn more about, and eventually perform, fastening and assembly. Understanding the differences between different assembly.

## Tools for Threaded Fasteners 235

### Fasteners

The class Tools for Threaded Fasteners provides a comprehensive overview of the different tools that are used to assemble threaded fasteners. There are many different types of tools used with threaded fasteners, but they all operate by applying torque. Manually powered hand tools include wrenches and screwdrivers. Power tools include battery-operated tools, electric tools, and pneumatic tools. Many power tools use clutches to control operation. These may be continuous-drive tools or discontinuous-drive tools. Threaded fasteners are the most commonly used fasteners in assembly, and assemblers must be familiar with the different tools they require. After taking this class, users will have foundational knowledge of the different types of tools used with threaded fasteners and their advantages and disadvantages. Users will also be able to identify some of the factors that go into selecting a tool for a threaded fastener application.

## Safety for Assembly 211

### Fasteners

The class Safety for Assembly provides a comprehensive overview of different safety precautions for assembly. Assemblers must wear proper clothing and protective equipment, which varies for different tasks. A safe assembly site is organized and clean, with clear paths around workstations. Working in assembly requires an awareness of electrical, forklift, and point of operation safety precautions, as well as proper fall prevention and tool handling procedures. Applying ergonomics to assembly helps prevent injury caused by repetition, poor posture, and excessive force. Before beginning any assembly work, assemblers must know the appropriate safety precautions and be trained to use required protective equipment. This can be challenging because there are different precautions for different tasks. After taking this class, users will be familiar with the basic safety guidelines for assembly, which will prepare them to perform various assembly operations safely and effectively.

## 5S Overview 151

### Lean

"Five S Overview" provides a thorough introduction to the purpose and process of 5S quality initiatives. This class includes separate discussions on each of the five steps, along with information on challenges, advantages, and possible assessment tools. Many companies implement quality initiatives to improve operations and eliminate waste. 5S is a quality method that promotes organization, efficiency, and team work through several sequential steps. After completing this class, users will understand the value of each 5S step and be better equipped to execute and evaluate 5S.

## Quality Overview 111

### Quality

"Five S Overview" provides a thorough introduction to the purpose and process of 5S quality initiatives. This class includes separate discussions on each of the five steps, along with information on challenges, advantages, and possible assessment tools. Many companies implement quality initiatives to improve operations and eliminate waste. 5S is a quality method that promotes organization, efficiency, and team work through several sequential steps. After completing this class, users will understand the value of each 5S step and be better equipped to execute and evaluate 5S.

## Troubleshooting 181

### Lean

Troubleshooting provides a comprehensive overview of various methods and tools used to troubleshoot problems. Troubleshooting often involves finding the root cause of a problem and being able to distinguish deviations from problems and early warning signs from warning signs. Many tools are used to collect and interpret troubleshooting data, including check sheets, fishbone diagrams, and Pareto charts. The 5 Why technique, brainstorming, documentation, and troubleshooting teams are common methods of gathering troubleshooting data. Troubleshooting teams gather data in order to find possible solutions. Teams must test solutions to make sure they offer long-term results. Troubleshooting is an extremely important skill for all areas of industry. The information provided in this class prepares students to solve problems and understand how to work to prevent them in many different settings. Without this knowledge, students would not be able to solve problems effectively.

## Introduction to CNC Machines 201

### CNC

Intro to CNC Machines provides a comprehensive introduction to computer numerical control (CNC), which uses numerical data to control a machine. CNC machines rely on a system of three linear and three rotational axes in order to calculate the motion and position of machine components and workpieces. A machine control unit controls and guides the movements of the machine tool. This class also describes PTP positioning, which moves to the end position before the tool begins to cut, and continuous path systems that can move a tool along two or more axes at once and cut during the movement. Additionally, closed-loop systems provide feedback, while open-loop systems do not. CNC machines are used to make a variety of products using a number of different processes. With proper training, a human operator can use CNC machines to make accurate parts with decreased risk of error. After taking this class users should be able to describe common components of CNC machine tools and controls.

## Introduction to Robotics 201

### Robotics

Introduction to Robotics describes the basics of industrial robotics, including types, applications, and programming methods. Industrial robots are reprogrammable machines that can perform repetitive or dangerous tasks with a high degree of accuracy. Manufacturers increasingly use robots to perform such tasks in order to speed up production, improve part quality, and preserve operator safety. However, robots require human engineers and operators to program, maintain, repair, and oversee them. Industrial robots are highly complex machines that come in a number of types, including

stationary robots and mobile robots. These robots are made of a number of intricate components that must be assembled and maintained properly. Similarly, all robots must be programmed to perform a task, and that programming can require adjusting. After taking this class, students will know the basic robot components, type, applications, and programming methods, as well as safety protocols.

## **Lockout/Tagout Procedures 141**

### **Safety**

Lockout/Tagout Procedures details the OSHA requirements and best practices for preventing accidental startup during maintenance and repair. It addresses electrical power and the many other forms of energy that a machine or device may use. All forms of energy must be successfully restrained or dissipated in order for safe maintenance. Lockout/Tagout Procedures describes using a lockout device that prevents unauthorized access of the energy-isolating mechanism. OSHA has strict requirements for lockout and tagout devices, which must be standardized, easily recognized warning signs. Users will learn OSHA's specific steps for all parts of the control of hazardous energy, from shutdown to startup, including defining authorized vs. affected employees. Following proper lockout/tagout procedures is essential to preventing employee injuries and fatalities. All employees must be familiar with lockout/tagout in order to prevent the dangers of accidental machine startup.

## **Robot Safety 211**

### **Robotics**

Robot Safety discusses the different ways to prevent robot accidents. Robot accidents can result in serious injuries or fatalities. Most accidents occur because employees bypass the robot's safeguards. There are two kinds of safeguarding systems that protect employees from injury when working with robots. Safety devices stop a robot from operating. Presence-sensing mats, for example, end robot operations when the pressure or weight of an employee is detected. Safety barriers prevent employees from accessing or entering dangerous robot work areas. For example, perimeter fences block employee access to areas where robots are working. Employees must receive training on the robot and wear protective clothing when near the robot. The robot must be installed and maintained as intended by the manufacturer and by authorized personnel only. All robot operators require a certain level of experience and training to work with the robot.

## **Introduction Additive Manufacturing 111**

### **Additive Manufacturing**

Introduction to Additive Manufacturing provides an overview of additive manufacturing (AM), including its history, advantages, disadvantages, basic steps, methods, and materials. Additive manufacturing is a rapidly growing industry that allows for rapid prototyping and the creation of more complex and functional parts, including end-use parts and traditional manufacturing tooling. AM encompasses a variety of build methods, such as material jetting and material extrusion. An understanding of the AM basics is useful for anyone working in the manufacturing industry. AM methods often streamline manufacturing processes and improve products and profitability. After completing this class, users will have gained important foundational AM knowledge, including the different AM methods and processes, the uses of AM, and the potential for future AM industrial growth.

## **Lean Manufacturing Overview 101**

### **Lean**

Lean Manufacturing Overview provides an introduction to the principles and terminology of lean strategies, including a discussion of the seven forms of waste, the definition of value-added, the difference between push and pull systems, and the importance of continuous improvement. This class also highlights other quality concepts, such as single minute exchange of dies (SMED), inventory reduction, and Five S. Lean manufacturing approaches help companies optimize their processes through organization and waste reduction. Although change can be a challenge, more efficient, streamlined processes will ultimately lead to improved customer satisfaction. This class outlines the foundational concepts and vocabulary that every practitioner needs when beginning, or continuing, a lean initiative.

## **NIMS Milling**

NIMS Core Milling Skills 131

NIMS Core CNC Milling Skills 141

NIMS Core Mill Programming and Setup Skills 231

NIMS Core Manual Milling Skills 261

## **NIMS Turning**

NIMS Core Turning Skills 132

NIMS Core Lathe Programming and Setup Skills 232

NIMS Core Manual Turning Skills 262

## **WORKFORCE ESSENTIALS (Additional Optional Courses)**

### **Careers in Manufacturing 102**

#### **Workforce Essentials**

Careers in Manufacturing 102 provides a foundational overview of various fields within the manufacturing industry and common tasks they involve. Manufacturing provides many different career opportunities and a range of pathways to them. Individuals can tailor their own paths to the level and field of their choosing. Major career fields include development and design, production, quality, maintenance, health and safety, logistics, and business. The manufacturing industry's workforce needs are constantly changing, but manufacturers consistently report job openings, especially in skilled fields. After taking this class, users will be familiar with the variety of career opportunities and choices within manufacturing. This knowledge will help encourage and prepare them to select a career in manufacturing.

### **Manufacturing 101**

#### **Workforce Essentials**

Manufacturing 101 provides a broad overview of the manufacturing process and industry. Manufacturing involves a wide range of processes that are used to turn materials into products. Many organizations work together in a supply chain to produce a product. Products start out as designs and are then produced from materials and assembled to create the final product. The manufacturing industry is a vast, diverse network of organizations that offers a wide variety of career opportunities. After taking this class, users will have a foundational understanding of the manufacturing industry and the various activities that are required to create a product. This will prepare them for further learning about specific manufacturing processes and considerations, as well as pursuing a career in manufacturing.

# CERTIFIED MANUFACTURING ASSOCIATE SKILLS CHECKLIST



## 1.0 Safety

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**Performance Objective 1.1:** Demonstrate the ability to select and use common safety practices required for most manufacturing environments.

	Performance Indicator	Verification Date/Initial
1.1.1	Demonstrate proper selection and use of safety glasses.	
1.1.2	Demonstrate proper selection and use of a clear face shield.	
1.1.3	Demonstrate proper selection and use of safety gloves.	
1.1.4	Demonstrate proper selection and use of ear plugs/muffs.	
1.1.5	Demonstrate proper selection and use of protective footwear.	
1.1.6	Demonstrate the ability to identify hazards in a work area.	
1.1.7	Recognize and identify an emergency stop on a piece of equipment.	
1.1.7	Recognize and identify the different safeguarding systems on a piece of equipment.	

**Performance Objective 1.2:** Demonstrate the ability to properly use a Safety Data Sheets (SDS) in the workplace

	Performance Indicator	Verification Date/Initial
1.2.1	Demonstrate proper selection of SDS sheets.	
1.2.2	Identify and describe ingredients listed on a SDS sheet.	
1.2.3	Identify and describe first aid measures listed on a SDS sheet.	
1.2.4	Identify and describe hazard identifications listed on a SDS sheet.	
1.2.5	Identify and describe firefighting measures listed on a SDS sheet.	
1.2.6	Identify and describe storage and handling listed on a SDS sheet.	
1.2.7	Identify and describe physical and chemical properties listed on a SDS sheet.	
1.2.8	Identify and describe the chemical stability and reactivity listed on a SDS sheet.	
1.2.9	Identify and describe toxicological information listed on a SDS sheet.	
1.2.10	Identify and describe the disposal requirements listed on a SDS sheet.	

**Performance Objective 1.3:** Demonstrate the ability to properly perform fire safety.

	Performance Indicator	Verification Date/Initial
1.3.1	Demonstrate the ability to identify locations of the fire exit, fire hose, and fire extinguisher using a Fire Prevention Plan (FPP) document.	
1.3.2	Demonstrate the ability to identify and eliminate fire hazards	
1.3.3	Demonstrate the ability to select and properly use a fire extinguisher to put out a small fire.	

**Performance Objective 1.4:** Demonstrate proper hand and power tool safety.

	Performance Indicator	Verification Date/Initial
1.4.1	Identify and inspect eye wash stations, hand wash stations, first aid kits, and fire extinguishers on the shop floor.	
1.4.2	Demonstrate the inspection and safe use of common hand tools	
1.4.3	Demonstrate the inspection and safe use of common power tools	

**Performance Objective 1.5:** Demonstrate the ability to recognize proper lock out tag out practices.

	Performance Indicator	Verification Date/Initial
1.5.1	Demonstrate the ability to properly verify that an electrical, hydraulic, or pneumatic energy source has been isolated.	
1.5.2	Demonstrate the ability to recognize and correct hazards that prevent the safe re-energizing of equipment.	
1.5.3	Demonstrate the ability to remove all locks, clasps, and tags from each isolation point.	

## 2.0 Quality and Lean

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**Performance Objective 2.1:** Demonstrate the ability to perform the stages of 5S.

	Performance Indicator	Verification Date/Initial
2.1.1	Identify and implement the 5S stage, Sort.	
2.1.2	Identify and implement the 5S stage, Set in Order.	
2.1.3	Identify and implement the 5S stage, Sweep and Shine.	
2.1.4	Identify and implement the 5S stage, Standardize.	
2.1.5	Identify and implement the 5S stage, Sustain.	
2.1.6	Identify and implement the 5S Plus 1 stage, Safety.	

## 3.0 Inspection

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**Performance Objective 3.1:** Demonstrate the use and care of common inspection instruments and gages.

	Performance Indicator	Verification Date/Initial
3.1.1	Demonstrate the ability to interpret a print.	
3.1.2	Demonstrate the ability to identify the measured feature on a part.	
3.1.3	Demonstrate the ability to select the correct inspection tools for a given part feature.	
3.1.4	Demonstrate the ability to operate a 0-6 in. digital caliper.	
3.1.5	Demonstrate the ability to read a digital caliper.	
3.1.6	Demonstrate the ability to operate a 2-3 in. depth micrometer.	
3.1.7	Demonstrate the ability to interpret tolerances.	
3.1.8	Demonstrate the ability to take a measurement using the gage block.	
3.1.9	Demonstrate the ability to interpret go/no-go gaging	

## 3.0 Inspection (Continued)

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**Performance Objective 3.1:** Demonstrate the use and care of common inspection instruments and gages.

	Performance Indicator	Verification Date/Initial
3.1.10	Demonstrate the ability to interpret a print and determine thread tolerance using a thread chart as reference.	
3.1.11	Demonstrate the ability to use thread ring gages.	
3.1.12	Demonstrate the ability to operate a telescoping gage.	
3.1.13	Demonstrate the ability to operate Vernier micrometers.	
3.1.14	Demonstrate the ability to read Vernier scale.	
3.1.15	Demonstrate the ability to read a tape measure	

## 4.0 Fasteners

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**Performance Objective 4.1:** Demonstrate the ability to identify various fasteners and fastening tools.

	Performance Indicator	Verification Date/Initial
4.1.1	Select proper fastener tools for various threaded and non-threaded fasteners.	
4.1.2	Demonstrate safe practices for working with hand tools.	
4.1.3	Demonstrate safe practices for working with power tools.	
4.1.4	Demonstrate safe practices for using pneumatic tools	
4.1.5	Demonstrate proper posture as it relates to assembly.	

## 5.0 CNC

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**Performance Objective 5.1:** Demonstrate the ability to identify various CNC tools.

	Performance Indicator	Verification Date/Initial
5.1.1	Visually identify the major assemblies of a Lathe	
5.1.2	Visually identify the major assemblies of a Mill	
5.1.3	Demonstrate the proper use of guarding on a Lathe	
5.1.4	Demonstrate the proper use of guarding on a Mill	
5.1.5	Visually identify and demonstrate the use of the emergency stop/cut-off for a Lathe	
5.1.6	Visually identify and demonstrate the use of the emergency stop/cut-off for a Mill	

## 6.0 Robotics

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**Performance Objective 6.1:** Demonstrate the ability to identify various parts of a robotic system.

	Performance Indicator	Verification Date/Initial
6.1.1	Visually identify the major assemblies of an industrial robot.	
6.1.2	Visually identify the safeguarding systems that protect employees from injury when working with robots	

## 7.0 Additive Manufacturing

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**Performance Objective 7.1:** Demonstrate the ability to identify Additive Manufacturing systems.

	Performance Indicator	Verification Date/Initial
7.1.1	Visually identify Additive Manufacturing equipment	
7.1.2	Visually identify supplemental tools used in Additive Manufacturing	
7.1.3	Visually identify parts made by Additive Manufacturing	

Student Signature:	Completed: MM/DD/YY
Verifier Signature:	Completed: MM/DD/YY



**CERTIFIED MANUFACTURING  
ASSOCIATE  
BODY OF KNOWLEDGE**



[sme.org/cmfga](http://sme.org/cmfga)

# MANUFACTURING ASSOCIATE

## BODY OF KNOWLEDGE 2020

Topics	Competency
<b>1. Shop Essentials (Applied Mathematics)</b>	
1.1 Mathematics	Understand & Apply
1.1.1 Perform calculations involving addition	
1.1.2 Perform calculations involving subtraction	
1.1.3 Perform calculations involving multiplication	
1.1.4 Perform calculations involving division	
1.2 System of Measurement	Understand & Apply
1.2.1 Perform calculations involving common English units	
1.2.1 Perform calculations involving metric units	
1.2.2 Perform conversions between the two systems	
1.3 Fractions and Decimals	Understand & Apply
1.3.1 Perform calculations involving fractions	
1.3.2 Perform calculations involving decimals	
1.3.3 Perform conversions between the two types	
<b>2. Safety</b>	
2.1 Safely assembling components	Remember & Understand
2.1.1 Describe best practices for safely assembling components	
2.1.2 Describe proper ergonomics and use of personal protective equipment	
2.2 Intro to OSHA	Remember & Understand
2.2.1 A basic awareness of standards, rights, and responsibilities for workplace safety and keeping the workplace legally compliant	
2.3 OSHA Regulations (PPE)	Remember & Understand
2.3.1 Regulations for personal protective equipment (PPE)	
2.3.2 Impact on day-to-day operations in the workplace	

# MANUFACTURING ASSOCIATE

## BODY OF KNOWLEDGE 2020

2.4 OSHA Regulations (Lockout/Tagout)	Remember & Understand
2.4.1 Describe OSHA regulations regarding lockout/tagout procedures	
2.4.2 Describe OSHA regulations regarding energy isolation	
2.4.3 Describe the impact on day-to-day operations in the workplace	
2.5 OSHA Regulations (Hazardous Materials)	Remember & Understand
2.5.1 Describe OSHA regulations regarding hazardous materials	
2.5.2 Describe Safety Data Sheets (SDS) and how they impact day-to-day operations in the workplace	
2.6 Fires and Safety	Remember & Understand
2.6.1 Describe OSHA regulations regarding fire safety and how they impact day-to-day operations in the workplace	
2.7 Bloodborne Pathogens	Remember & Understand Understand & Apply
2.7.1 Describe OSHA regulations regarding bloodborne pathogens and how they impact day-to-day operations in the workplace	
2.8 Hand and Power Tools	Remember & Understand
2.8.1 Describe the safe use of hand and power tools used on the job	
<b>3. Quality</b>	
3.1 Quality Overview	Remember & Understand
3.1.1 Describe the importance of quality throughout different departments of an organization	
3.1.2 Describe the use of different quality management systems and tools in manufacturing processes and products	
<b>4. Lean</b>	
4.1 5S Principles (Sort, Set in Order, Sweep, Standardize, Sustain)	Remember & Understand
4.1.1 Restate terms associated with 5S principles	
4.1.2 Restate examples for each term specific to the person's working environment	

# MANUFACTURING ASSOCIATE

## BODY OF KNOWLEDGE 2020

4.2 Lean Manufacturing Overview	Remember & Understand
4.2.1 Understand the principles and terminology of lean	
4.2.2 Describe the seven forms of waste, value-added, push and pull systems, and the importance of continuous improvement	
<b>5. Inspection</b>	
5.1 Inspection Instruments and Gages	Remember & Understand
5.1.1 Describe the use and care of common inspection instruments and gages used in the shop	
5.2 Part Tolerancing	Remember & Understand
5.2.1 Describe common methods used for part tolerancing	
5.2.2 Describe the impact that tolerances have on part production and quality	
5.3 Assembly Print	Remember & Understand
5.3.1 Read an assembly print with an exploded view describe how key assemblies of the component are joined	
5.4 Troubleshooting	Remember & Understand
5.4.1 Understand various methods and tools used to troubleshoot problems	
5.4.2 Describe tools that are used to collect and interpret data including check sheets, fishbone diagrams, and Pareto charts	
5.4.3 Understand the 5 Why technique, brainstorming, documentation, and troubleshooting teams which are common methods of gathering troubleshooting data	
<b>6. Fasteners</b>	
6.1 Identify common assembly and late-stage processes that take place in industrial facilities	Remember & Understand
6.2 Assembling Components	Remember & Understand
6.2.1 Describe best practices for safely assembling components, including proper ergonomics and use of personal protective equipment	

# MANUFACTURING ASSOCIATE

## BODY OF KNOWLEDGE 2020

6.3 Tools for threaded fasteners	Remember & Understand
6.3.1 Identify different types of tools used with threaded fasteners	
6.3.2 Identify the advantages and disadvantages of the different types of tools	
6.3.3 Identify factors that go into selecting a tool for a threaded fastener application	
<b>7. CNC</b>	
7.1 CNC machine tools and controls	Remember & Understand
7.1.1 Describe common components of CNC machine tools and controls	
<b>8. Robotics</b>	
8.1 Industrial robots	Remember & Understand
8.1.1 Describe the basics of industrial robotics, including types, applications, and programming methods and safety protocols.	
8.1.2 Identify different ways to prevent robot accidents	
8.1.3 Describe the different kinds of safeguarding systems that protect employees from injury when working with robots	
<b>9. Additive Manufacturing</b>	
9.1 Overview of AM	Remember & Understand
9.1.1 Identify the basic steps, methods, processes, and materials	
9.1.2 Identify the advantages and disadvantages of AM	
9.1.3 Identify uses of AM	

## Machinists Institute MECHANIC CURRICULUM



### **AST Safety & Tools**

An overview of shop safety theory, hand tools, lifting basins, and precision measurement and theory. Includes pre- and post-tests in application of safe practices and tool use.

### **Tool Basics**

Introduction to common tools (ammeter, gauges, jack stands, torque wrenches, etc.). Math techniques, including measurements/calculations/conversions.

### **Basic Employment Skills**

Instruction/overview of acceptable employee standards including timeliness, ability to take direction, task completion, appropriate communication styles, and personal appearance, as well as honesty, integrity and reliability.

### **Basic Communication Skills**

Techniques for effective communication in the workplace. Includes lessons that emphasize importance of verbal, written and reading skills in the trades.

### **Introduction to Trade Math**

Review of basic math skills related to the trades and demonstration of how they apply in context. Covers multiple systems of measurement, decimals, fractions, and basic geometry.

## **ENGINE MECHANICAL BASICS**

**Description of course:** This is a preparatory course that provides a foundational overview of mechanical systems. Simple machines are the building blocks of even the most complex mechanical systems because they manipulate mechanical forces including distance and friction, to achieve mechanical advantage. Understanding how simple machines work is essential to understanding and working with any type of machinery. Students will be familiarized with each type of simple machine, their components, functions, and mechanical advantages, as the basis for understanding advanced mechanical topics.

Students will be able to describe mechanical systems and factors affecting mechanical advantage. They will describe the three classes of levers; wheels and axles; fixed and movable pulleys; and differences in mechanical advantage between movable pulley systems. They will identify inclined planes; wedges; screws; and different types of gears.

Students will also distinguish between other devices used in mechanical systems and describe gravity and friction effects on machines. They will be able to contrast equilibrium and dynamic forces; distinguish between linear and rotary motions; between linear and rotary speeds and velocity.

At the completion of the course, students will evaluate power, manual, and automatic transmissions, and will be able to identify common mechanical faults that occur in motor drive systems and their symptoms. They will discuss, compare, and contrast the importance of reactive and corrective maintenance and how they differ from preventive maintenance. Students will list the significance of planned downtime on maintenance and discuss factors involved in selecting a maintenance approach.

**Topics include:** Introduction to Mechanical Systems 101, Forces on Machines 121, Power Transmission Components 201, Mechanical Power Variables 201, Mechanical Maintenance for Motor Drive Systems 349, Approaches to Maintenance 131

### **DIESEL MECHANICAL BASICS**

**Description of course:** This is an introductory course to diesel systems including the diesel engine, diesel engine support systems, and the exhaust system. The class includes an overview of the diesel cycle, and a short history of the diesel engine and covers the changeable aspects of mechanical power. Basic power variables include speed, power, torque, horsepower, and mechanical forces. All machines rely on rotary motion, linear motion, or a combination of the two to perform work, and different power variables relate to each type of motion. Effectively converting one form of motion to another requires a clear understanding of the functional and mathematical relationship between the two forms.

**Topics include:** Mechanical Power Variables 202

**PRE-APPRENTICESHIP COURSE BREAKDOWN****Machining**

SME's Certified Manufacturing Associate (CMfgA)

25 Modules @ 1.5 hours each

**Working or In School****Out of Work**

37.5

37.5

NIMS Manual Mill &amp; Lathe

6 Modules @ 1.5 hours each

9

9

Lab for 31 Modules

87.5

155.5

Digital Literacy

10 Modules @ 2 hours/2.5 hours

20

30

Mentorship Matters

4

4

Suicide Prevention

3

3

Financial Literacy

6

6

Career Search &amp; Readiness

12

12

Final Project

2 weeks @ 20 hours/28 hours

40

56

Industry Tours &amp; Speakers

7 Tours

2121**TOTAL****240 Hours****336 Hours****Heavy Duty Mechanic**

AST Safety &amp; Tools

38

38

Tool Basics

20

20

Basic Employment Skills

8

8

Basic Communication Skills

8

8

Introduction to Trade Math

10

10

Engine Mechanical Basics

22

24

Diesel Mechanical Basics

24

24

Additional Lab Hours

68

Digital Literacy

10 modules @ 2 hours/2.5 hours

20

30

Mentorship Matters

4

4

Suicide Prevention

3

3

Financial Literacy

6

6

Career Search &amp; Readiness

12

12

Final Projects

2 weeks @ 20 hours/28 hours

40

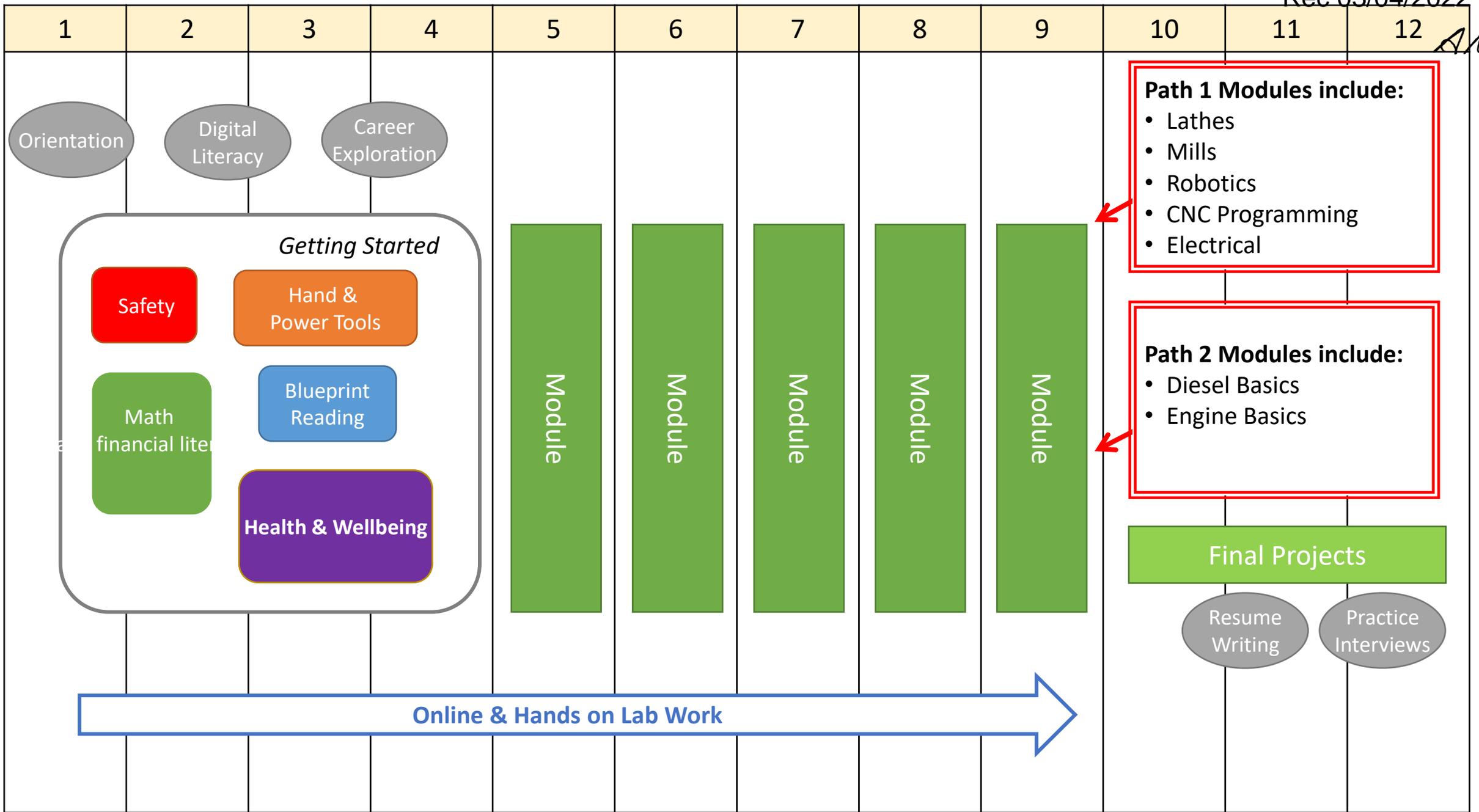
56

Industry Tours &amp; Speakers

8 Tours

2525**TOTAL****240 Hours****336 Hours**

AN





# STANDARDS FOR ESSENTIAL COMPUTER SKILLS

## Basic Computer Skills

1. Distinguish between different types of devices (tablets, desktop and laptop computers).
2. Identify specific computer hardware (system unit, monitor, printer, keyboard, mouse or touchpad, ports, touchscreen).
3. Log on to and shut down a computer.
4. Demonstrate knowledge of keys on keyboard (Enter, Shift, Control, Backspace, Delete, Arrow Keys, Tab, Caps Lock, Number Lock).
5. Identify types of mice: mouse and touchpad.
6. Identify mouse pointer shapes and the functions they represent (spinning wheel (loading), iBeam (text), arrow (basic clicking), hand pointer (clickable links)).
7. Demonstrate knowledge and appropriate use of mouse clicks (right-click, left-click, and double click).
8. Drag and drop.
9. Utilize common controls for screen interaction (selecting check boxes, using drop-down menus, scrolling).
10. Access and control audio output features (volume, mute, speakers and headphones).
11. Identify icons on desktop.
12. Demonstrate ability to trash and retrieve items using the trash or recycle bin.
13. Demonstrate understanding that it is possible to customize a computer for increased accessibility (customizing a mouse for left-handed use and sensitivity, and changing screen resolution on a monitor).
14. Demonstrate understanding that software programs are upgraded periodically to fix bugs and increase utility, and that different versions may be installed on different computers.
15. Identify mechanisms for storing files (flash drives, hard drives, cloud-based storage).
16. Identify whether or not a computer is connected to the internet.
17. Identify and locate camera and mic on laptops, tablets.
18. Turn computer and monitor on and off.

# STANDARDS FOR ESSENTIAL COMPUTER SKILLS

## Internet Basics

1. Identify the different ways a person can connect to the internet.
2. Demonstrate knowledge of browsers and identify commonly used browsers.
3. Demonstrate familiarity with website structure (e.g., landing pages, internal pages).
4. Identify top-level domains (e.g., .edu, .com, .org).
5. Demonstrate understanding of how to use browser tools and settings to protect privacy (e.g., private browser windows, clearing search history, and declining to save passwords on shared computers).
6. Demonstrate understanding of when it's safe and appropriate to share personal, private, or financial information (e.g., recognizing phishing attempts, identifying unsecured websites).
7. Identify ways to protect your devices (e.g., anti-malware software, recognizing possible virus attacks).
8. Demonstrate to a website that you are a legitimate user using CAPTCHA or other verification methods.
9. Fill out an online form.
10. Identify address bar and demonstrate understanding of its functionality.
11. Identify common browser tools and icons (e.g., favorites, downloads, refresh, and back).
12. Perform internet search using clear parameters (terms and filters).
13. Demonstrate ability to scroll up and down a page and left and right on a page.
14. Identify and make use of common website interactions (e.g., play buttons, hyperlinks).
15. Identify and work with tabs and windows.
16. Enable a specific pop-up window.
17. Use shortcut keys, or menu or mousing equivalents, to support user experience on the web (e.g., zoom, find text). Identify and locate camera and mic on laptops, tablets.
18. Turn computer and monitor on and off.

# STANDARDS FOR ESSENTIAL COMPUTER SKILLS

## Using Email

1. Define email and identify common email clients.
2. Tell the difference between a URL and an email address.
3. Register for a new email account, using a professional user name and a strong password.
4. Log into email.
5. Create and send an email, including recipient address, subject, and message.
6. Open and reply to an email.
7. Understand why and how to reply, reply all, and forward an email.
8. Add an attachment to an email.
9. Open and download an email attachment.
10. Manage email: Delete and retrieve messages, identify spam, and unsubscribe from unwanted mailing lists.
11. Understand basics of email etiquette (using salutations and closings, avoiding all caps, making use of the subject line, understanding when it's ok to forward messages, knowing who to cc or bcc, etc.).
12. Use caution when opening or replying to an email from an unfamiliar source, downloading attachments, following links, or giving out personal information.
13. Sign out of email, especially when using shared computers.

# STANDARDS FOR ESSENTIAL COMPUTER SKILLS

## Windows

1. Identify the operating system used by a computer.
2. Identify the parts of the Windows 10 interface (desktop, taskbar, etc.).
3. Demonstrate knowledge of the Windows Start Menu, including Get Help.
4. Use Cortana to search for a file, program, or document.
5. Identify icons, functions, and any file extensions related to basic office software (Word, PowerPoint, and Excel) and default Windows programs (Microsoft Edge, Windows Defender, etc.).
6. Start and exit programs.
7. Minimize and maximize windows.
8. Open, close and switch between windows.
9. Demonstrate knowledge of Windows File Explorer and identify drives on the computer, as well as cloud storage services (e.g., OneDrive).
10. Move documents and files, including to and from Recycle Bin.
11. Log off, restart, and shut down a computer.
12. Use Settings to uninstall or modify apps.

# STANDARDS FOR ESSENTIAL COMPUTER SKILLS

## Mac OS

1. Identify the operating system used by a computer.
2. Identify the parts of the Mac OS interface (desktop, Dock, Menu Bar, etc.).
3. Use the Help menu.
4. Use Finder or Spotlight to locate files and folders.
5. Open applications using Siri, Spotlight, Launchpad, the Dock, or the Applications Folder, and pin apps to the Dock.
6. Identify icons, functions, and any file extensions related to basic office software (Word, PowerPoint, and Excel) and default Apple programs.
7. Move documents and files, and create new folders.
8. Delete files, and recover them from the Trash.
9. Identify peripheral devices on a computer (flash drives, camera, etc.) and cloud storage options (e.g. iCloud).
10. Minimize and maximize windows.
11. Close, switch between, and quit applications.
12. Use the App Store to add and update apps.
13. Demonstrate knowledge of System Preferences.
14. Log out of, restart, and shut down a computer.

# STANDARDS FOR ESSENTIAL SOFTWARE SKILLS

## Microsoft Word

1. Open a new or existing document.
2. Identify the parts of the Word window, including the Ribbon, Status Bar and Quick Access Toolbar.
3. Save a document, being intentional about name and location.
4. Identify file extensions that can be opened by Microsoft Word.
5. Use Spelling and Grammar check.
6. Format text: size, color and font type.
7. Set text spacing and alignment.
8. Apply bullets and automatic numbering.
9. Undo the previous action.
10. Cut, copy and paste.
11. Modify page layout, including margins and orientation.
12. Print.
13. Close a document.
14. Insert objects into a document, including images, shapes, hyperlinks, and tables.

# STANDARDS FOR ESSENTIAL SOFTWARE SKILLS

## Microsoft Excel

1. Open and close a workbook.
2. Save a workbook, being intentional about name and location.
3. Identify parts of Excel screen: ribbon, formula bar, active cell, name box, column letter, row number, Quick Access Toolbar.
4. Locate a specific cell.
5. Enter data in a cell.
6. Copy and move cell entries.
7. Format cells and text: bold, underline, size, merge and center, wrap text, number (currency, time, percentages, etc.)
8. Create headings and freeze them.
9. Insert and delete rows and columns.
10. Adjust row and column size.
11. Identify worksheet tabs, create a new tab, rename tabs, and rearrange tabs.
12. Write a formula in the formula bar (-, +, \*, /).
13. Select a range.
14. Use Auto Fill and AutoSum (Sum, Average, etc.) and understand the differences between them.
15. Sort (least to greatest, alphabetically, etc.) and filter data.
16. Insert a chart to display data.
17. Select a print area, choose page orientation, and print.

# STANDARDS FOR ESSENTIAL SOFTWARE SKILLS

## Microsoft PowerPoint

1. Open a new or existing PowerPoint presentation.
2. Identify parts of the PowerPoint screen (slide navigation pane, slide pane, notes, the ribbon, quick access toolbar, and scroll bars).
3. Insert new slides, duplicate, or reuse slides.
4. Manage text (insert, delete, copy, cut and paste, drag and drop, format, and use spellcheck).
5. Apply or change a theme.
6. Use zoom control.
7. Insert items into a presentation, resize, and adjust them (video, chart, pictures, clip art, screenshots).
8. Add a textbox, adjust it, resize it, or delete it.
9. Change the view (normal view, slide sorter, reading view, slideshow view).
10. Insert, delete, and move slides using slide navigation pane.
11. Use the quick access toolbar.
12. Apply and customize slide transitions (select, preview, add sound, automatic advance).
13. Understand the basics of PowerPoint etiquette (limited text, text that stands out on background, clear titles).
14. Play a slideshow, advance through the slides, and end slideshow (using screen toolbar features).
15. Save a presentation as a .ppt, .pdf, .png, etc.
16. Create handouts.
17. Print a presentation.



# STANDARDS FOR ESSENTIAL SOFTWARE SKILLS

## Google Drive

1. Create a Google account using a professional username, a strong password, and a phone number.
2. Sign in and sign out of a Google account and navigate to Google Drive.
3. Identify the parts of the Google Drive interface, including the New button, the Google Apps menu, the search bar, the sort button, and the file action buttons.
4. Open existing and create new Google Docs, Google Sheets, and Google Slides.
5. Demonstrate ability to organize Google Drive by renaming, creating, starring, and moving files and folders.
6. Demonstrate understanding of how moving shared files and folders can impact access privileges for others.
7. Demonstrate ability to search for and find files and folders in different sections of Google Drive, including Shared with me, Recent, and Starred, or by using the search box.
8. Upload and download files to and from Google Drive.
9. Share files and folders using email addresses or direct links, being intentional about the difference between Viewer, Commenter, and Editor.
10. Remove files and Restore files from trash.
11. Recover your username and/or reset the password on a Google account.

# STANDARDS FOR ESSENTIAL SOFTWARE SKILLS

## Google Docs

1. Sign in and out of a Google account and navigate to Google Docs.
2. Identify the parts of the Google Docs interface, including menu bar, toolbar, document title, comments button, and share button.
3. Open a new or existing Google Docs document.
4. Rename a document.
5. Use Spelling and grammar check.
6. Format text: size, color and font type.
7. Set text spacing and alignment.
8. Apply bullets and automatic numbering.
9. Undo the previous action.
10. Cut, copy and paste text.
11. Modify page setup, including margins and orientation.
12. Insert objects into a document, including images, links, and tables.
13. Print.
14. Download a document in another file format, such as Word or PDF.



# STANDARDS FOR ESSENTIAL SOFTWARE SKILLS

## Google Docs

*(continued)*

15. Share a document, being intentional about the difference between Viewer, Commenter, and Editor.
16. Collaborate with others in Google Docs by using suggestion mode to track changes, accepting edits, and adding and replying to comments.
17. View and restore a previous version of a document.

# STANDARDS FOR ESSENTIAL SOFTWARE SKILLS

## Google Slides

1. Sign in and out of a Google account and navigate to Google Slides.
2. Open a new or existing Google Slides presentation.
3. Rename a presentation.
4. Identify the parts of the Google Slides interface, including menu bar, toolbar, slide pane, notes, and slide navigation panel.
5. Choose a presentation theme.
6. Insert new slides, duplicate, or reuse slides.
7. Apply a layout for a new slide, or change the layout of an existing slide.
8. Manage text (insert, delete, copy, cut and paste, format, and use spell check).
9. Insert items into a presentation, resize, and adjust them (images, shapes, text boxes, and charts).
10. Insert, delete, and move slides using the slide navigation pane.
11. Add slide transitions and animations.
12. Understand the basics of presentation etiquette and accessibility (limited text, legible text, clear titles).
13. Present a slideshow, advance through the slides, view speaker notes, and exit slideshow.

# STANDARDS FOR ESSENTIAL SOFTWARE SKILLS

## Google Slides

*(continued)*

14. Download a presentation in another file format, such as PowerPoint or PDF.
15. Preview print settings and select a format to print a presentation (slide with notes, without notes, handouts).
16. Share a presentation, being intentional about the difference between Viewer, Commenter, and Editor.
17. Collaborate with others in Google Slides by adding and replying to comments.
18. View and restore a previous version of a presentation.

# STANDARDS FOR ESSENTIAL SOFTWARE SKILLS

## Google Sheets

1. Sign in and out of a Google account and navigate to Google Sheets.
2. Open a new or existing Google Sheets spreadsheet.
3. Identify the parts of the Google Sheets interface, including menu bar, toolbar, spreadsheet title, formula bar, rows, and columns.
4. Locate a specific cell.
5. Enter data in a cell.
6. Copy, move, and delete cell entries.
7. Format cells and text: bold, underline, size, merge and center, wrap text, number (currency, time, percentages, etc.)
8. Create headings and freeze them.
9. Insert and delete rows and columns.
10. Adjust row and column size.
11. Identify spreadsheet tabs, create a new tab, rename tabs, and rearrange tabs.
12. Write a formula in the formula bar (-, +, \*, /).
13. Select a range.
14. Use functions to SUM, AVERAGE and COUNT cells.

# STANDARDS FOR ESSENTIAL SOFTWARE SKILLS

## Google Sheets

*(continued)*

15. Sort (least to greatest, alphabetically, etc.) and filter data.
16. Insert a chart to display data.
17. Print a spreadsheet choosing page orientation and formatting.
18. Share a spreadsheet, being intentional about the difference between Viewer, Commenter, and Editor.
19. Collaborate with others in Google Sheets by adding and replying to comments.
20. View and restore a previous version of a spreadsheet.



# STANDARDS FOR USING TECHNOLOGY IN DAILY LIFE

## Social Media

1. Identify different types of social media and their primary functions (especially Facebook, LinkedIn, Instagram, Twitter).
2. Create a new account on a social media network and log in.
3. Recognize information posted on social media networks that may present a risk to you (user as consumer of information).
4. Demonstrate knowledge of managing “friends” on Facebook: adding friends, accepting/declining “friend” requests, and the difference between that and “following” someone.
5. Understand and change privacy settings.
6. Demonstrate an understanding of the consequences of “liking” or commenting on something.
7. Share and delete content, including photos, videos, and links.
8. Identify information that is unwise to post and/or upload on a social media (too much personal sharing, inappropriate photos/comments).
9. Distinguish between public and private “spaces” on social media sites (e.g., Facebook messages vs. Facebook timeline).
10. Post, share, like, or comment on content.
11. Demonstrate knowledge of the permanence of anything posted on the internet.



# STANDARDS FOR USING TECHNOLOGY IN DAILY LIFE

## Information Literacy

1. Define a problem, formulate a question, or identify a decision that needs to be made.
2. Identify the purpose for accessing information (how the information will help solve the problem, answer the question, make a decision, or accomplish a goal or objective).
3. Define the kind of information needed to complete the task.
4. Identify types and formats of information found online (articles, databases, images, videos, etc.).
5. Plan steps required to solve the problem or accomplish the task.
6. Recognize the costs, in time or money, and benefits of accessing different sources of information (article, newspaper, consumer reports).
7. Demonstrate use of efficient search strategies to hone in on relevant information.
8. Locate relevant information in media found online, including text, video, images, etc. Locate the source of the information.
9. Make use of hyperlinks to follow desired/required path of information.
10. Demonstrate basic understanding of use of non-Internet sources of information (personal documents, Excel spreadsheets, etc).
11. Discern between relevant and non-relevant information in an information source and select the information that addresses the issue that motivated the search.
12. Determine the quality of information by identifying bias, assessing the reliability of sources, and identifying the impact of context.
13. File/store information in a format that facilitates ease of access for future use (e.g., file naming, folder organization, bookmarking, etc.)
14. Monitor extent to which information solves a problem and know when additional information is needed.
15. Synthesize relevant information from one or more sources.
16. Integrate new information into current knowledge and use it to support understanding, views, perspectives, or opinions.
17. Act on information to solve basic problems or answer a question.
18. Select appropriate format for sharing information, based on audience and purpose, and distribute to intended audience.
19. Evaluate the result of gaining/using the information. Was the question answered? Was the problem solved? Was a better decision made? Was a goal or objective met?



# STANDARDS FOR USING TECHNOLOGY IN DAILY LIFE

## Supporting K-12 Distance Learning

1. Understand models of remote instruction offered by schools (including synchronous and asynchronous distance learning, hybrid or blended learning) and strengths and challenges for each model.
2. Identify requirements for beginning distance learning successfully, including technology and technology support resources.
3. Log in and sign out of a distance learning platform.
4. Demonstrate internet skills essential for distance learning, including connecting a device to the internet, navigating to a website, closing and enabling pop-ups, and making use of common website interactions (e.g., play buttons, hyperlinks).
5. Understand the benefits and uses of parental control settings to create a safer online learning environment for children.
6. Identify the common features of distance learning platforms such as the dashboard, classes, calendar, and assignments.
7. Join a synchronous class meeting using a virtual meeting platform.
8. Mute, turn on/off video, chat, and change screen view in synchronous class meetings.
9. Understand basics of synchronous classroom etiquette.
10. Open an assignment in a learning platform and complete it using voice record, video, document upload, or other platform tools.
11. Organize links and passwords for quick access using browser favorites, password managers, or other tools.
12. Troubleshoot common technical issues encountered during virtual learning, including factors that may impact internet speed, audio and video issues.



# STANDARDS FOR USING TECHNOLOGY IN DAILY LIFE

## Supporting K-12 Distance Learning

*(continued)*

13. Advocate for your K-12 student's specific needs and/or ask for technical help by making use of virtual communication tools such as email or learning platform messaging.
14. Identify ways to provide support for K-12 students' social emotional development while participating in distance learning.



# STANDARDS FOR USING TECHNOLOGY IN DAILY LIFE

## Career Search Skills

1. Identify tools for determining career aptitude (self-assessment, interest inventories, skill identification, and values awareness).
2. Identify features and timeline of a job search plan.
3. Identify resources that aid in finding a job (internet resources, social media websites, job listings, targeted employment, job fairs, networking clubs, etc.)
4. Demonstrate the ability to use search and filter functions in job search sites.
5. Distinguish between skills sets (job skills, transferable skills, self-management skills, and emotional intelligence).
6. Demonstrate understanding of the value of volunteering.
7. Identify steps to prepare for a career or job fair (posting resume, preparing introduction, reading schedule/calendar).
8. Identify ways to research employers, labor markets, and salary ranges.
9. Identify elements of a strong portfolio including work samples and other supportive documents.
10. Identify elements of a cover letter and distinguish between weak and strong cover letters.
11. Identify elements of a resumé and best practices for writing one (including employment history, hard and soft skills, accomplishments, job search goals, gaps in employment, etc.)
12. Identify best practices for sending and following up with resumé.
13. Demonstrate understanding of hiring processes (including recruitment, screening, and selecting).
14. Identify the basic principles of direct employer contact (in-person, telephone, video calls, social media, and email).

# STANDARDS FOR USING TECHNOLOGY IN DAILY LIFE

## Career Search Skills

*(continued)*

15. Identify key steps in preparing for an interview including identifying common interview questions; distinguish between strong and weak answers to interview questions; how to practice for an interview, giving answers for gaps in employment or previous incarceration.
16. Distinguish between different types of interviews (such as screening, selection, informational, work sample, peer group, group, luncheon/coffee, stress, video conference, etc.).
17. Distinguish between legal and illegal job interview questions; appropriately respond to illegal questions in an interview.
18. Identify key post-interview steps (contacting references, thank you notes, social media).
19. Demonstrate understanding of proper etiquette throughout the job search process, including when you are not hired.
20. Demonstrate understanding of negotiables: salary, schedule, benefits, professional development, training, and vacation time.
21. Distinguish between jobs types (temporary, seasonal, part-time, full-time, and unpaid internships).
22. Identify best practices to be successful on the job (including meeting employer expectations, making arrangements so that responsibilities and problems outside of work do not interfere with the job, learning new skills, dressing professionally, showing appreciation, and accepting constructive criticism).



# STANDARDS FOR USING TECHNOLOGY IN DAILY LIFE

## Your Digital Footprint

1. Define digital footprint.
2. Understand why a digital footprint is important.
3. Understand the potential benefits of having a digital footprint.
4. Understand the sources of a digital footprint (browsing, job search, shopping, social media).
5. Understand that actions online can have unintentional impacts to your digital footprint.
6. Identify consequences of a digital footprint (permanent, real-life, employment-related).
7. Demonstrate how to manage an online identity responsibly.
8. Demonstrate ability to manage privacy settings.
9. Understand breaches of privacy and the dangers these represent.
10. Identify the different organizations interested in a digital footprint and what they might use it for (employers, retail, government).
11. Define cookies and understand how these are used to track a digital footprint.

# Suicide Prevention

*3 simple steps*

**question,  
persuade,  
refer.**



Each year thousands of Americans, like you, are saying "Yes" to saving the life of a friend, colleague, sibling, or neighbor.



MACHINISTS  
INSTITUTE

## Training Includes:

### QPR Gatekeeper (1 hour)

- How to Question, Persuade and Refer someone who may be suicidal
- The common causes of suicidal behavior
- The warning signs of suicide
- How to get help for someone in crisis



### Resilience & Thriving (2 hours)

- How to identify stress/stressors/triggers
- Good vs Bad coping strategies
- What are the Six Dimensions of Wellness
- Strategies for moving from Coping to Resilience to Thriving

# Manufacturing Certifications to Support Career Pathway

The **SME Certified Manufacturing Associate (CMfgA)** focuses on foundational manufacturing concepts and demonstrates an individual's potential for high-demand, entry-level careers in manufacturing such as assemblers, manufacturing associates, and production laborers. The credential can help individuals begin a lifelong career in an industry where there is opportunity for advancement and well-paying jobs.

After earning the **Certified Manufacturing Associate** credential, individuals can explore available career pathways in manufacturing. With the CMfgA credential as a strong foundation, an employee can continue with on-the-job training and further education to move along a career pathway.



# Entry-Level Careers in Manufacturing

The **Certified Manufacturing Associate** credential prepares individuals for careers in manufacturing, including the following in-demand job roles:

## Production Laborer



**Production Laborers** are responsible for assembly, machining, quality checks, tool changes, and problem solving of manufacturing processes and equipment.

In the last **12 months**, there were



**89,782** job postings nationally for **Production Laborers**.

Job openings for **Production Laborers** are expected to grow

**4.4%**  over the next **10 years**.

The average national salary range for



**Production Laborers** is **\$24,000 – \$30,000\***

## Laborer/Warehouse Worker



**Warehouse Workers** are responsible for picking and shipping parts from a warehouse. This includes staging, loading, unloading, stocking and maintaining the warehouse inventory.

In the last **12 months**, there were



**60,762** job postings nationally for **Laborer/Warehouse Workers**.

Job openings for **Laborer/Warehouse Workers** are expected to grow

**7.6%**  over the next **10 years**.

The average national salary range for



**Laborer/Warehouse Workers** is **\$24,000 – \$28,000\***

## Manufacturing/Production Technician



**Production Technicians** ensure that a quality product is delivered quickly and according to safety, environmental, and health procedures and regulations. These individuals set up, start up, operate, and shut down manufacturing equipment. They inspect products to ensure quality, and may calibrate or adjust equipment and machinery settings in order to produce the desired product.

In the last **12 months**, there were



**21,436** job postings nationally for **Manufacturing/Production Technicians**.

Job openings for **Manufacturing/Production Technicians** are expected to grow

**5.2%**  over the next **10 years**.

The average national salary range for



**Manufacturing/Production Technicians** is **\$32,000 – \$42,000\***