MSSC-RELATED U.S. DOL-APPROVED APPRENTICESHIP PROGRAMS

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The U.S. Department of Labor has approved two MSSC-related apprenticeship, which are described below. MSSC delivers its training and certification services through 3300 MSSC-authorized Instructors and 2000 MSSC-authorized Assessment Centers, mostly at community colleges and secondary schools, and MSSC Training Solution Providers in all 50 states.

MSSC CERTIFIED PRODUCTION TECHNICIAN HIGH SCHOOL PRE-APPRENTICESHIP

Traditionally focused on two-year colleges, MSSC is becoming increasingly active in high school settings with 250 actively participating in the MSSC Certified Production Technician (CPT®) program. In January 2018, the U.S. DoL officially approved the MSSC CPT High School Pre-apprenticeship as meeting DoL criteria for a *high-quality, nationwide high school pre-apprenticeship*.

An *earn-and-learn competency-based program,* it takes place over 2 years. It consists of:

- Related Training: 80 hours junior year and 80 hours senior year
- On the Job Learning (OJL): 280 hours (8 weeks) in the summer of junior year and 280 hours (8 weeks) in the summer of senior year, for which the student will receive a stipend from the participating employer
- A MSSC Certificate of Completion at the end of the pre-apprenticeship

During Related Training portion of this program, the candidate earns the industry-recognized, nationally portable MSSC Certified Production Technician (CPT) or the **hands-on** CPT+ based upon the new and highly innovative Amatrol "Skill Boss" training device, see brochure here. CPT+ is an additional, but strongly recommended option under the CPT program.

MSSC suggests that the participating employer pay $2800 per year per candidate for this program: $1000 goes to the high school (or partnering community college) for the Related Training and $1800 goes to a student summer stipend (about $6.50 per hour) for the student's 80 hours per summer semester of On-the-Job Learning (OJL). The 2-year total employer contribution is $5600-6000 per student. Costs will vary, and some states help employers defray apprenticeship fees.

For details on the four CPT key work activity areas (aka Modules) covered in the Related Training, see Attachment A. For tasks covered in the OJL portion, see Attachment B.

INDUSTRIAL MANUFACTURING TECHNICIAN (IMT) REGISTERED APPRENTICESHIP

IMT is rooted in the MSSC goal of certifying the "Industrial athletes of the future" able to keep pace with technology and with the agility to perform a wide variety of tasks on the plant floor. Entry-level Industrial Manufacturing Technicians operate industrial production related equipment, work with manufacturing related tools, and perform work processes **related to a wide variety of manufacturing settings.** Apprentices will learn to set up, operate, monitor, and control production equipment. They will also help improve manufacturing processes and schedules to meet customer requirements.

The term of apprenticeship shall be Hybrid, which has been established to be 3,000 hours. In addition to the specified hours, the apprentice must successfully attain the competencies described in these program provisions. Hours of labor shall be the same as established for other skilled employees in the occupation.

MSSC CPT is a Related Instruction provider for more than sixty 3,000-hour registered apprenticeship programs for the occupation of Industrial Manufacturing Technician (IMT), approved by U.S. DoL in 2014. A full CPT or CPT+ represents 160-170 hours of the 260 hours of Related Instruction under the IMT program, with the OJL taking up the remaining 2736 hours.

While partnered with IMT, the MSSC High School Pre-apprenticeship can serve as a high-quality feeder system for most 3,000-hour+ Registered Apprenticeships in manufacturing.

For details on the Related Training portion of IMT, see Attachment C. For details on the OJL portion, see Attachment D. U.S. DoL issues a Registered Apprenticeship Certificate at the end of IMT.

For details, please contact Tyler Kennedy, Manager of Strategic Initiatives, MSSC at tkennedy@msscusa.org or visit www.msscusa.org.

January 2023

ATTACHMENT A

Certified Production Technician

Key Work Activities for Standards, Training and Assessments

SAFETY

1. Work in a Safe and Productive Manufacturing Workplace
2. Perform safety and environmental inspections
3. Perform emergency drills and participate in emergency teams
4. Identify unsafe conditions and take corrective action
5. Provide safety orientation for all employees
6. Train personnel to use equipment safely
7. Suggest processes and procedures that support safety of work environment
8. Fulfill safety and health requirements for maintenance, installation, and repair
9. Monitor safe equipment and operator performance
10. Utilize effective, safety-enhancing workplace practices

MANUFACTURING PROCESSES & PRODUCTION

1. Identify customer needs
2. Determine resources available for the production process
3. Set up equipment for the production process
4. Set team production goals
5. Make job assignments
6. Coordinate work flow with team members and other work groups
7. Communicate production and material requirements and product specifications
8. Perform and monitor the process to make the product
9. Document product and process compliance with customer requirements
10. Prepare final product for shipping or distribution

QUALITY PRACTICES & MEASUREMENT

1. Participate in periodic internal quality audit activities
2. Check calibration of gages and other data collection equipment
3. Suggest continuous improvements
4. Inspect materials and product/process at all stages to ensure they meet specifications
5. Document the results of quality tests
6. Communicate quality problems
7. Take corrective actions to restore or maintain quality
8. Record process outcomes and trends
9. Identify fundamentals of blueprint reading
10. Use common measurement systems and precision measurement tools

MAINTENANCE AWARENESS

1. Perform preventive maintenance and routine repair
2. Monitor indicators to ensure correct operations
3. Perform all housekeeping to maintain production schedule
4. Recognize potential maintenance issues with basic production systems, including knowledge of when to inform maintenance personnel about problems with:
    - Electrical systems
    - Pneumatic systems
    - Hydraulic systems
    - Machine automation systems
    - Lubrication processes
    - Bearings and couplings
    - Belts and chain drives

ATTACHMENT B

MSSC CPT HIGH SCHOOL PRE-APPRENTICESHIP

ON-THE-JOB-LEARNING WORK PROCESS SCHEDULE: In order to obtain well-rounded introductory training, this pre-apprentice shall demonstrate competency at the basic, introductory level in all the core technical competencies of advanced manufacturing. Those basic functions are specified below, but not necessarily in the sequence given. Time spent on specific operations need not be continuous. An experienced worker needs to provide the training and testing of the pre-apprentice for the work processes described below.

Work Process Description	Hours
Orientation 1. Attend plant briefing on the industry, company, and plant goals 2. Participate in a full plant tour	5
Protect self and other workers from accidents and injuries 1. Follow industry-specific safety procedures around electricity, machines, equipment and manufacturing processes 2. Demonstrate use of Personnel Protective Equipment (PPE), first aid, CPR, and blood borne pathogens	25
Operate production equipment 1. Start and operate production equipment 2. Operate equipment safely and efficiently 3. Monitor and adjust equipment during operations as needed 4. Shut down equipment properly	135
Produce quality product 1. Perform quality checks 2. Verify product quality following quality work instructions	120
Interpret technical information 1. Interpret production orders properly 2. Follow quality specifications accurately	50
Measure and inspect work using mechanical tools and testing equipment 1. Measure and visually inspect materials, products or parts, and finished 2. Use gauges and measuring devices accurately	50
Demonstrate knowledge of routine equipment maintenance 1. Apply preventative maintenance practices effectively 2. Demonstrate awareness of basic maintenance concepts	25
Demonstrate knowledge of inventory and material processes 1. Demonstrate awareness of process flows in a manufacturing plant 2. Work with production materials according to work schedule	25

Demonstrate knowledge of trends and the current state of the business 1. Describe the importance of department and plant goals 2. Participate in plant leadership and team briefings	25
Demonstrate continuous improvement 1. Identify potential defects 2. Use tools for continuous improvement effectively 3. Enter records regarding machine faults 4. Follow standard work instructions proper **Set up production equipment** 1. Plan for and identify set-up requirement 2. Perform mechanical set-up according to employer's Standard Operating Procedure manual, and equipment manufacturers specifications **Local Options** (Additional 10 hours) The employer establishes additional basic training in competencies not otherwise stated in this Exhibit, to be demonstrated by the apprentice and performed for some or all of the required minimum hours for Local Options, and/or the employer may distribute some or all of the required minimum hours to one or more work processes stated in this Exhibit. **TOTAL OJL HOURS: 560**	25

ATTACHMENT C

RELATED INSTRUCTION

INDUSTRIAL MANUFACTURING TECHNICIAN
O*NET-SOC CODE: 17-3029.09 RAPIDS CODE: 2030HY

Overview

Related instruction teaches apprentices the science and theory behind their daily duties. It comprises **264** hours of the apprenticeship program, the equivalent of four hours per week when school is in session. The apprentice is paid by the employer to attend.

Course Descriptions

Industrial Manufacturing 1 (First Semester)
The first semester includes an orientation to the occupation and manufacturing, then followed by the Manufacturing Skills Standards Council **(MSSC) safety module, MSSC quality module**, OSHA 10 certification, blueprint reading, visual inspection, measurement, and first aid & CPR training. Manufacturing concepts will be introduced and applied in a variety of industrial settings.

Industrial Math for the Occupation (First Semester)

This course provides applied mathematics instruction from a review of: basic arithmetic; basic algebra; applications, based on geometry; right triangle trigonometry, oblique angle trigonometry and compound angles. U.S. and metric measurement systems will be introduced.

Industrial Manufacturing 2 (Second Semester)

The second semester includes the **MSSC manufacturing processes and production and maintenance awareness modules,** along with communication, lean manufacturing, problem solving, and frontline leadership. Manufacturing related concepts will be applied to a variety of industrial settings. The course concludes with an examination of emerging trends and technologies, and future directions for manufacturing.

Communication for Apprentices (Second Semester)

Introduces the apprentice to basic communication concepts relating to the workplace. It is designed specifically for the apprentice to acquire the necessary skills of giving instructions, writing a technical memo, and explaining a technical process. Throughout the course the apprentice will brainstorm, write, edit, revise, and use one-on-one communication delivery in a small group. The course combines lecture and hands-on activities utilizing information which the apprentice brings from the workplace.

BAS Transition to Trainer (Final Semester) Developed by the Office of Apprenticeship Standards, this 8-hour course teaches soon-to-be journey workers how to serve as a mentor and job coach, how to provide hands-on skill training, and how to give positive and effective performance feedback. Course is offered at multiple times each year. Course meets for 8 hours.

ATTACHMENT D

WORK PROCESS SCHEDULE
INDUSTRIAL MANUFACTURING TECHNICIAN
O*NET-SOC CODE: 17-3029.09 RAPIDS CODE: 2031HY

In order to obtain well-rounded training and thereby qualify as a skilled worker in the occupation, the apprentice shall have experience and training in the following areas and shall demonstrate competency, as specified herein. This instruction and experience shall include the following operations, but not necessarily in the sequence given. Time spent on specific operations need not be continuous.

Work Process Description

Protect self and other workers from accidents and injuries

1. Follow industry-specific safety procedures around electricity, machines, equipment manufacturing processes
2. Minimize potential hazards
3. Work following OSHA industrial safety standards
4. Maintain clean work areas and follow Six Sigma practices
5. Demonstrate awareness of first aid, CPR, and blood borne pathogens
6. Inspect, maintain, and report and replace hand tools and power equipment

100 hours

Operate production equipment

1. Works according to production schedules to meet job specifications
2. Operates equipment safely and efficiently
3. Monitor and inspect products and processes
4. Monitor and adjust equipment during operations as needed
5. Documents work, work processes, and adjustments
6. Shuts down equipment properly
7. disassembles equipment and components, if appropriate
8. Cleans up tooling, equipment, and work spaces
9. Sanitizes equipment according to applicable standards

1000 hours

Produce quality product

1. Verifies product quality following quality work instructions
2. Report completed work accurately
3. Perform quality checks
4. Demonstrate awareness of defects and causes of rework
5. Monitors the cost of poor quality (including scrap and rework)
6. Apply cost of quality principles to jobs and manufacturing processes
7. Apply quality training to job duties and work processes
8. Document all quality tests & understand implications and consequences of documentation
9. Adhere to customer specific quality requirements
10. Follow company specific quality guidelines

500 hours

Interpret technical information

1. Use blueprints, formulas, and process control sheets efficiently
2. Reference project plans and documents by completing an apprenticeship Job Book or checklist of competency completion
3. Apply job specifications to work processes accurately
4. Interprets production orders properly

200 hours

Measure and inspect work using mechanical tools and testing equipment

1. Measure and visually inspect materials, products or parts, and finished goods accurately in accordance with job specifications
2. Apply math to measuring and inspection of work
3. Interpret tolerances using blue prints and job specifications
4. Use gauges and measuring devices accurately
5. Verify workmanship and compliance with job specifications
6. Identify and report non-compliant stock, material, parts, or finished goods
7. Inspects materials, parts, products, or finished goods in accordance with documentation.

200 hours

Demonstrate knowledge of routine equipment maintenance

1. Inspect equipment
2. Demonstrate mechanical problem-solving abilities
3. Identify when a machine is not working properly
4. Apply preventative maintenance practices effectively
5. Follow general lubrication guidelines
6. Maintain machine components following manufacturer specifications (if applicable)
7. Follow basic troubleshooting guides
8. Assist and communicate with maintenance personnel on equipment malfunctions
9. Demonstrate awareness of basic maintenance concepts

100 hours

Demonstrate knowledge of inventory and material processes

1. Apply lean manufacturing principles to work processes
2. Compare inventory flow to roles and responsibilities
3. Demonstrate aware of process flows in a manufacturing plant
4. Identify material management processes
5. Demonstrate awareness of logistics related to raw materials and customer deliveries
6. Work with production materials according to work schedules
7. Apply basic manufacturing equipment operations

100 hours

Demonstrate knowledge of trends and the current state of the business

1. Identify the competition and potential opportunities (Ex. Strengths, Weaknesses, Opportunities and Threats or related analysis)
2. Explain the competition and potential opportunities between internal businesses
3. Describe the importance of department and plant goals (Ex. Key Performance Indicators)
4. Apply basic business terms to manufacturing related work processes
5. Demonstrate awareness of both upstream and downstream
6. Participate in company leadership briefings
7. Relate the job role and trade to keeping jobs

100 hours

Demonstrate continuous improvement

1. Suggests improvements to business and manufacturing processes
2. Uses tools for continuous improvement effectively
3. Minimizes and removes process wastes (associated with water, energy, manufacturing processes, and other resources)
4. Participates in continuous improvement for professional growth
5. Identifies potential defects
6. Follows standard work instructions properly
7. Maintains records regarding machine faults
8. Applies visual management/visual controls through Six Sigma
9. Applies root cause analysis to continuous improvement of manufacturing work processes
10. Applies autonomous maintenance principles
11. Practices quick change overs (Ex. Six-Minute Exchange of Die)
12. Identifies equipment abnormalities
13. Adapts to process changes including cycle times, set-ups, and tooling
14. Participates in cross-training opportunities
15. Understands the business strategies and motives for continuous improvement
16. Applies profitable sustainability concepts to continuous improvement

100 hours

Set-up production equipment

1. Plans for and identifies set-up requirements
2. Selects tools and materials
3. Verifies safety
4. Assembles equipment
5. Performs mechanical set-up according to employer's Standard Operating Procedure manual, and equipment manufacturer's specifications
6. Tests and verifies set-up
7. Adjusts set-up as needed to meet product and production specifications
8. Interprets visual controls accurately
9. Inspects equipment and components

200 hours

Local Options

The employer will establish additional training in the form of competencies not otherwise stated in this Exhibit, to be demonstrated by the apprentice and performed for some or all of the required minimum hours for Local Options, and/or the employer may distribute some or all of the required minimum hours to one or more work processes stated in this Exhibit.

136 hours

TOTAL HOURS: 2,736

July 2017