# Wisconsin Youth Apprenticeship

## Manufacturing

# PROGRAM GUIDE


**Department of Workforce Development**

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# MANUFACTURING
# YOUTH APPRENTICESHIP
# PROGRAM GUIDE

## Description

Manufacturing is the engine that drives American prosperity. It is central to our economic and national security. However, often the perception is that the heyday of U.S. manufacturing is in the past. Nothing could be further from the truth. In many regions of the U.S. there is great demand for highly skilled technicians. Trends indicate while low skill jobs continue to outsource to low wage countries, high skill jobs in manufacturing will grow with the use of computers and robotics, and need for green energy components.[1]

Furthermore, manufacturing is the backbone of the Midwest economy. The national average for Manufacturing employment is 9%, but is close to 12% in the Midwest, with both Indiana and Wisconsin employing 16% of the labor force in Manufacturing. While companies recover from the recent recession, output will continue to grow.[2]

This Youth Apprenticeship occupational area focuses on four of the six pathways within the Manufacturing industry. The Logistics and Inventory Control pathway is covered in the Transportation, Distribution and Logistics YA program. In the Production pathway, skills are required to work with machines to make or assemble parts or products. Processes from both the Manufacturing Production Process Development pathway and the Quality Assurance pathway are incorporated into Production Operations Management which covers monitoring and ensuring processes and products meet specifications. Preventive maintenance, troubleshooting and repair of tools and equipment are learned in the Maintenance, Installation, and Repair pathway.

The Youth Apprenticeship Program was approved by the Wisconsin State legislature in 1991 to provide a direct link between business, schools, and youth to meet the workforce demands of technology, teamwork, communication, and leadership.

Wisconsin Youth Apprenticeship (YA) is a rigorous program that combines academic and related technical classroom instruction with mentored on the job learning for high school students. By training youth apprentices, employers play an active role in shaping the quality of their future workforce, improving the skill level of potential workers, and enhancing their competitive positioning in the marketplace. Employers, school districts, local consortiums, parents, and potential YA students are referred to the Youth Apprenticeship Program Operations Manual for general YA Program requirements.

## Objective

[1] Manufacturing Career Cluster brochure, NCTEF, 2010.
[2] Georgetown University CEW, The Midwest Challenge, http://cew.georgetown.edu/regions/, Septemeber 2011.

The Wisconsin Manufacturing YA Program is designed to provide students with a working understanding of core manufacturing industry skills and occupationally specific technical skills in four of the six pathways within the Manufacturing industry. This program provides the framework for educators and industry to work together to produce work-ready, entry-level employees that will compete favorably in a global market, as well as, provide for post-secondary educational advancement while integrating work-based learning in the school and worksite.

The following features distinguish a YA Program from other similar youth school to work programs.

- Level Two Youth Apprenticeship is a two-year program for high school juniors and seniors with an interest in a particular field; i.e., manufacturing. One-year Youth Apprenticeship Programs are also available to pursue.
- Youth apprentices, parents, employers, YA program coordinators, and school districts enter into a written agreement approved by the Department of Workforce Development.
- Statewide skills are established by the industry, making the youth apprentice skill set more relevant to the state's employers.
- Youth apprentices are trained at the worksite by skilled mentors and are paid minimum wage or better for their work. Students average 10-15 hours per week.
- Youth apprentices receive a high school diploma and a Certificate of Occupational Proficiency from the Wisconsin Department of Workforce Development (DWD) at graduation.
- Youth apprentices may receive advanced standing credit and/or transcripted credit for the YA Program at a Wisconsin Technical College and/or at some four year colleges. See **Appendix F** for current details.
- Statewide skill standards focus on skills and knowledge needed by employers for entry level employment in the Manufacturing industry.

Students apply and are interviewed by Manufacturing employers for positions in the Manufacturing YA Program. The state approved skill standards and program guide for the Manufacturing YA Program are used in both the classroom instruction and worksite learning. If the local school district is unable to provide the related technical classroom instruction courses, they may contract with their local technical college or employer practitioners to do so.

The skill standards are competency based. Competencies are performance-based outcome statements of occupational related skills defined by representatives of Manufacturing worksites throughout Wisconsin and aligned with national skill standards. The competencies are aligned with the National Association of State Directors of Career Technical Education Consortium (NASDCTEc) Career Cluster Skill Standards in Manufacturing, http://www.careertech.org/ for four of the Manufacturing pathways: Production, Quality Assurance, Manufacturing Production Process Development, and Maintenance, Installation, and Repair. Competencies for Logistics and Inventory Control can be found in the Transportation, Distribution and Logistics YA program.

The competencies will be taught at the worksite in combination with supportive, related technical classroom instruction. While the skill competencies are established statewide, program implementation and oversight occurs through local consortium committees to assure local needs are met.

## Target Population

This Youth Apprenticeship occupational area focuses on Manufacturing pathway YA students acquiring basic skills pertinent to understanding and working in careers to plan, manage, and perform processing of materials into products. The Production units (Assembly and Packaging, Manufacturing Processes, Machining, Welding) allow students to work with a variety of equipment and processes to transform materials into parts or products. The Production Operations Management unit gives students a chance to plan and manage processes that monitor and ensure that materials and products are produced according to specification in an efficient manner. The Maintenance, Installation, and Repair units (Basic and Advanced Industrial Equipment) allow students to monitor, troubleshoot, and repair the equipment necessary for production operations.

All students successfully meeting current high school graduation requirements and with a good attendance record for that year are encouraged to apply for the Manufacturing Youth Apprenticeship (YA) Program. The student must apply to the program in the year previous to program entry and be on track toward fulfilling high school graduation requirements in their school district. SEE **Appendix G** for students entering or continuing the Manufacturing YA Program in 2012.

All Youth Apprentices must complete the industry-wide foundational skill competencies consisting of competencies in core employability skills, safety, and manufacturing fundamentals. The Required Skill competencies may be completed concurrently with the specific technical skills.

Potential Manufacturing youth apprentices will be required to complete a ***minimum*** of 450 work hours with 180 hours (2 semesters) of related technical classroom instruction for a Level One (1-year) Manufacturing YA Program or a ***minimum*** of 900 work hours with 360 hours (4 semesters) of related technical classroom instruction for a Level Two (2-year) Manufacturing YA program.

The industry- specific technical skill competencies can be chosen based on interest and job placement. Worksites can be chosen from any number of the manufacturing SUB-INDUSTRIES:

- Chemical
- Computers and Electronic
- Electrical Equipment and Appliances
- Food and Beverage
- Furniture
- Machine
- Non-Metallic Minerals
- Plastic and Rubber Production
- Primary and Fabricated Metals
- Textiles
- Wood

PROCESSING any variety of manufacturing MATERIALS:

- Metals (Ferrous, Non-Ferrous, Powdered)
- Polymers (Wood, Textiles, Leather, Plastic, Elastomer)
- Composites

Chemicals
Finishes (Wood Finishes, Metal Finishes)
Food and Beverage

PROVIDED THAT the competencies related to that SUB-INDUSTRY, MATERIAL, and EQUIPMENT USED are allowable by DWD Child Labor Laws. See Appendix A for more detail or contact the Department of Workforce Development's Equal Rights Division/Labor Standards Bureau at 608-266-6860 for questions regarding child labor laws.

**Manufacturing Units**

**Production Pathway-**

Assembly and Packaging Unit
Manufacturing Processes Unit
Machining Unit
Welding Unit

**Production Operations Management Pathway-**

Production Operations Management Unit

**Maintenance, Installation, and Repair Pathway-**

Basic Industrial Equipment Unit
Advanced Industrial Equipment Unit

## Manufacturing YA Program Responsibilities

The following responsibilities are outlined for individuals involved in the Manufacturing YA Program.

**Students-**

1. Maintain academic skills and attendance at the high school to remain on track for high school graduation.
2. Participate in progress reviews as scheduled.
3. Exhibit maturity and responsibility to meet requirements of employment as designated by the employer.

**Parents or Guardians-**

4. Ensure that adequate transportation is available to and from the worksite.
5. Participate in student progress reviews as scheduled.

**School District-**

6. Recruit students and coordinate student enrollment in the program with the consortiums and/or employers.
7. Integrate the YA Program related technical classroom instruction and worksite training into the student's overall education program with high school graduation credit issued for each semester successfully completed.

8. Participate in student progress reviews as scheduled.

**YA Program Coordinators-**

9. Apply and maintain approval from the DWD to operate a YA Program.
10. Ensure a minimum of 450 hours of worksite instruction/experience plus a minimum of 180 hours of related technical classroom instruction for each one year YA program.
11. Establish and meet regularly with an advisory committee that will identify when and where tasks will be taught during the Manufacturing YA Program.
12. Develop and maintain a yearly commitment with participating high schools, technical colleges, and local businesses to accommodate the number of students involved in the Manufacturing YA Program.
13. Establish and maintain a YA student grievance procedure.
14. Provide employer mentor training.

**Related Technical Classroom Instruction Faculty-**

15. Qualify in the specialty areas being taught in the YA Program.

**Employers and Worksite Mentors-**

16. SEE **Appendix B -** Manufacturing YA Implementation Guide for Employers.
17. Participate in a mentor training session and provide on the job training of the Youth Apprentices.

**Department of Workforce Development-**

18. Monitor national and state regulatory agencies, such as OSHA, for changes and impact on the Manufacturing Youth Apprenticeship Program.

## Program Guide Organization

The competencies included in the program guide are aligned with the skills required under the National Association of State Directors of Career Technical Education Consortium (NASDCTEc) Career Cluster Skill Standards in Manufacturing, http://www.careertech.org/, for four of the six Manufacturing pathways: Production, Quality Assurance, Manufacturing Production Process Development, and Maintenance, Installation, and Repair.

The Manufacturing YA Program also requires that Related Technical Classroom Instruction is provided to support attainment of the knowledge necessary to master the competencies. While recommendations for specific Related Technical Classroom Instruction are detailed separately in **Appendix C**, instructional requirements will vary depending on local consortium and advisory group decisions. It is strongly advised that local consortiums work with their advisory groups to determine appropriate Related Technical Classroom Instruction based on their local needs and resources.

The Youth Apprenticeship Program Guide is written and organized according to the Worldwide Instructional Design System (WIDS) format and includes the Manufacturing YA Skill Standards Checklist, Program Appendices and Unit Appendices, and Course Outcome Summary (COS)

for the program. Overall progress is documented on the Skill Standards Checklist, which lists skill level achievement for each competency achieved. The Unit Appendices outline each skill competency with corresponding performance standards and learning objectives. The Performance Standards describe the tasks and behaviors, as applicable, that employers should look for in order to evaluate the competency. The Learning Objectives outline the recommended content to be covered in the related technical classroom instruction. SEE **Appendix D** - Wisconsin Instructional Design System (WIDS) Format and Youth Apprenticeship Program Guide Terms and **Appendix E** - Use and Distribution of the Curriculum for further details.

## Evaluation

The student must successfully complete the related technical classroom instruction and demonstrate the minimum skill level required on the Manufacturing YA Skill Standards Checklist for each competency according to the applicable curriculum. Worksite mentors and/or instructors use this checklist to evaluate the learner on each of the required skills. It is the responsibility of the mentor(s) to rate the students skill level on all tasks performed at the worksite.

## Manufacturing YA Program Completion

Upon successful completion of high school and the Level Two (2 year) Manufacturing YA Program requirements, the youth apprentice will receive a high school diploma and the applicable Certification of Occupational Proficiency from the Department of Workforce Development indicating “Manufacturing Youth Apprenticeship". Youth Apprentices who successfully complete a Level One (1 year) Manufacturing YA Program and who are on track for graduation will be eligible for a Level One Certificate from the Department of Workforce Development. Furthermore, the YA students may;

1. Continue to work in the manufacturing industry.
2. Apply to a registered apprenticeship.
3. Pursue a degree or diploma from a Wisconsin Technical College with advanced standing and/or transcripted credit.
4. Apply for admission to a four-year University of Wisconsin school with high school academic elective credit for admission.
5. Go into military service.

SEE **Appendix F** for current agreements for post-secondary credit at Wisconsin Technical Colleges and University of Wisconsin colleges.

*This curriculum was developed through a grant from the Wisconsin Department of Workforce Development to Wisconsin's Cooperative Educational Services Agency 6 (CESA6)*

## Appendices

Appendix A - Work Contracts, Child Labor Laws, Liability and Insurance

Appendix B - Manufacturing YA Implementation Guide for Employers

- Benefits to the Employer
- Role of the Employer
- Role of the Mentor
- Checklist for Program Participation
- Checklist for Program Operation
- Frequently Asked Questions
- Work Contracts, Child Labor Laws, Liability and Insurance (insert Appendix A)

Appendix C - Recommended Related Technical Classroom Instruction

Appendix D - Wisconsin Instructional Design System (WIDS) Format and Youth Apprenticeship Program Guide Terms

Appendix E - Use and Distribution of the Curriculum

Appendix F - Post Secondary Credits

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Appendix L - Manufacturing Processes (Unit 5)

Appendix M - Machining (Unit 6)

Appendix N - Welding (Unit 7)

Appendix O - Production Operations Management (Unit 8)

Appendix P - Maintenance, Installation, and Repair (Units 9-10)