

# Appendix C

## RECOMMENDATIONS FOR RELATED TECHNICAL CLASSROOM INSTRUCTION FOR MANUFACTURING YA

These recommendations are intended to be used by the Local YA Consortium when determining appropriate related technical instruction for Manufacturing YA. It is not all inclusive but should be used to assist the partnership with identification and/or development of course work that supports the work-based competencies as identified in the Skill Standards Checklist. As with all YA programs the consortium must ensure that the related instruction meets with the approval of their administration and school board.

### OPERATIONAL NOTES

Related Technical Classroom Instruction maybe offered by the employer, within the school district, at another school district, at a Wisconsin Technical College, and/or at a Community College or University by instructors qualified according to the Youth Apprenticeship Program Operations Manual.

Learning Objectives are the foundation of related technical classroom instruction. Consortiums may teach using locally developed coursework; however, it is recommended that agreements with the local technical college be pursued to obtain post-secondary credit for YA worksite and classroom experiences.

A minimum of 180 hours (2 semesters) of related technical instruction is required for each one year YA program with 250 of the **work** hours coinciding with the instruction. The student must also receive high school credit towards graduation for this instruction, no matter the provider.

It is suggested that the following courses or learning experiences be provided as a pre-requisite OR concurrently for students interested in this youth apprenticeship:

- Metals/Machining
- Manufacturing/Industrial Arts
- Welding
- Computer Aided Drafting (CAD)/Technical Drawing
- Electronics/Electricity
- Additionally, students should complete a job shadow prior to enrollment in the Manufacturing YA program.

Commercial programs or Employer provided classroom certification programs are also appropriate provided that the student receives high school credit towards graduation for the class work. Possible classroom programs include training and certification by Manufacturing Skill Standards Council (MSSC) (<http://www.msscusa.org/>), American Welding Society (ASW) (<http://www.aws.org/w/a/>), National Institute for Metalworking Skills, Inc. (NIMS) (<https://www.nims-skills.org/web/nims/home>), and National Center for Manufacturing Sciences (NCMS) (<http://www.ncms.org/>).



## Manufacturing Youth Apprenticeship (YA) Plan of Study

**NAME:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

The Related Technical Instruction course selection and delivery are entirely within local consortium control. The recommendations listed below are only a suggested path of YA career planning and should be individualized to meet each learner’s educational and career goals. All plans should meet high school graduation requirements, as well as, college entrance requirements as applicable.

**HIGHLY Recommended for ALL Manufacturing YA students**

Educational Level	Grade	English/ Language Arts  4 required	Social Studies Social Sciences  3 Required	Math  2 Required	Science  2 Required	Career Pathway Courses  (Electives)	Recommended Enhancement Electives or Activities
<b>Secondary</b>	<b>9</b>	Oral Communication (Speech)		Technical Math and Measuring	Physical Science	Manufacturing/Industrial Arts Metals/Machining	Skills USA
	<b>10</b>				Chemistry	Manufacturing/Industrial Arts Metals/Machining Electricity/Electronics Computer Applications	Skills USA
	<b>11</b>				Physics (Engineering)	<b>Manufacturing Youth Apprenticeship - Level One –</b> Computer Aided Drafting (CAD)/Technical Drawings Industrial Arts/Equipment Operation Welding Safety in the Workplace Employability Skills	
	<b>12</b>			Calculus (Engineering)		<b>Manufacturing Youth Apprenticeship - Level One or Two –</b> Advanced Manufacturing Welding	

# Post-Secondary Occupational Opportunities

The chart below shows examples of career ladders organized by manufacturing career pathway.

For additional career cluster information, visit [www.careerclusters.org](http://www.careerclusters.org)

For additional career information on a specific occupation, visit <http://wiscareers.wisc.edu/> or <http://worknet.wisconsin.gov/worknet/default.aspx>

		High School Diploma, On-the-Job Training, Apprenticeships	Certificate / License (1 year or less college)	Associate's Degree (2 year college)	Bachelor's/Master's Degree (4 year college)
Manufacturing Pathways	Production Process & Development		Power Plant Operators Industrial Engineering Technicians: Lab Technicians / Process Control Technicians / Process Improvement Technicians / Quality Control Technicians First-Line Supervisors/Managers of Production and Operating Workers	Industrial Engineering Technicians: Manufacturing Technicians Electro-Mechanical Technicians Engineering Technicians, Except Drafters Mechanical Engineering Technicians Civil Engineering Technicians	Industrial Engineers: Manufacturing Engineers Civil Engineers: Design Engineers Mechanical Engineers: Design Engineers Electronics Engineers, Except Computer Electrical Engineers
	Quality	QC Lab Tech Instrumentation Technician	Calibration and Instrumentation Technicians Industrial Engineering Technicians: Lab Technicians / Process Control Technicians / Quality Control Technicians	Industrial Engineering Technicians: Lab Technicians / Process Control Technicians / Quality Control Technicians	Industrial Engineers: Quality Engineers Logisticians: Statistical Process Control (SPC) Coordinators
	Health, Safety, & Environmental Awareness		Compliance Officers Except Agriculture, Construction, Health and Safety, Transportation: Environmental Compliance Inspectors	Environmental Science and Protection Technicians, Including Health Environmental Engineering Technicians	Environmental Engineers Health and Safety Engineers, Except Mining Safety Engineers and Inspectors

		High School Diploma, On-the-Job Training, Apprenticeships	Certificate / License (1 year or less college)	Associate's Degree (2 year college)	Bachelor's/Master's Degree (4 year college)
Manufacturing Pathways	Production	Carpenters Engraver Production and Planning Clerk Production Assembler Metalworkers Foundry Mold/Core makers Tool & Die Makers Grinders Welders, Cutters, Solders, Brazers	Computer-Controlled Machine Tool Operators: Automated Manufacturing Technician Electrical and Electronics Repairers, Commercial and Industrial Equipment Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic Hoist and Winch Operators Machinists: Instrument Makers / Machine Operators Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic Sheet Metal Workers Tool and Die Makers Welders, Cutters, Solderers, and Brazers	Industrial Engineering Technicians	Industrial Production Managers Technical Education Teacher
Manufacturing Pathways	Maintenance	Control/Valve Repair Electric Tool Repair	Medical Equipment Repairers: Biomedical Equipment Repairers Communications / Telecommunications Equipment Installers and Repairers Except Line Installers Electrical and Electronics Repairers, Commercial and Industrial Equipment: Electrical Equipment Installers/Repairers Industrial Machinery Mechanics: Maintenance Repairers Maintenance and Repair Workers, General Electricians: Job/Fixture Designers / Facility Electricians Control and Valve Installers and Repairers, Except Mechanical Door: Meter Installers/Repairers Electric Motor, Power Tool, and Related Repairers: Major Appliance Repairer	Computer, Automated Teller, and Office Machine Repairers: Computer Installers/Repairers / Computer Maintenance Technicians Electrical and Electronics Repairers, Commercial and Industrial Equipment Industrial Engineering Technicians	

SOURCES: The States' Career Clusters Initiative, 2007, [www.careerclusters.org](http://www.careerclusters.org); The Oklahoma Department of Career & Technology Education, 2007; Waukesha County Technical College (WCTC), Susan Maresh, Waukesha County School-to-Work, 2007; Wisconsin's Worknet 2007, <http://worknet.wisconsin.gov>.