



## EMPLOYABILITY PROFILE Mechanical Technology



### Industry Based Skill Standards

#### Proficiency Definitions

NA = Not Applicable      1 = Developing      2 = Basic      3 = Proficient      4 = Mastery

	9th	10th	11th	12th
<b>Design Process</b>				
Define and apply the design process.				
Create a sketch of a multiview drawing given an isometric drawing.				
Explain the factors involved in brainstorming, prototyping and reverse engineering.				
<b>Measuring Tools</b>				
Demonstrate mastery of measuring instruments; scale and tape measure.				
Identify precision measuring devices.				
Demonstrate mastery of Vernier Calipers and Micrometers.				
<b>Machine Tool Fundamentals</b>				
Demonstrate basic hand tool care and use (e.g., drills, saws, wrenches).				
Perform basic troubleshooting maintenance procedures.				
Identify specific machine tools and their function.				
Construct component from an assembly drawing.				
<b>Math and Science Measurements</b>				
Develop and interpret graphs and charts.				
Solve problems involving geometric shapes, using formulas.				
Calculate torque, speed, voltage, and ratios using standard equations.				
<b>Safety</b>				
Use electrical power tools safely.				
Perform a Lockout and Tag out procedure.				
Complete OSHA 10 safety course.				
Explain and demonstrate basic industrial safety rules and how to report unsafe conditions.				
Identify fire exits, firefighting equipment, and evacuation procedures.				
Perform an equipment safety check.				
Locate and interpret an SDS document.				
Identify and properly don and doff proper personal protective gear.				
<b>Technical Drawings</b>				
Develop 2 dimensional drawings with AutoCAD.				
Interpret commonly used symbols from a drawing.				
Determine dimensions and tolerances from a drawing.				
Extract information from a title block.				
Identify the type of lines used on a drawing.				
<b>Mechanical Drive Systems</b>				
Explain the function of a mechanical drive.				
Identify and demonstrate the use of different types of mechanical drives including key fasteners, power transmission, spur gears and multiple shaft drives, v-belt, and chain drives.				
<b>Computer Use</b>				
Develop charts and graphs from data.				
Describe different methods of tracking inventory.				
Demonstrate use of Microsoft Office applications.				

	9th	10th	11th	12th
<b>Electronics</b>				
Use DVM and Analog Voltmeter to gather electrical measurements.				
Calculate unknown values using Ohms law.				
Troubleshoot simple electric circuits.				
Identify electrical components and what they are used for.				
Interpret basic ladder diagrams.				
<b>Materials and Layout</b>				
Explain the physical, mechanical, and chemical properties of materials.				
Describe how physical, mechanical, and chemical properties of materials relate to manufacturing applications.				
Explain layout practices using a precision surface plate.				
<b>Precision Machining Technology</b>				
Use measurement and calibration when using machine tools.				
Determine the kind of tools and equipment needed to do a job.				
Determine causes of operating errors and deciding what to do about it.				
Conduct tests and inspections of products, services, or processes to evaluate quality or performance.				
Perform routine maintenance on equipment and determine when and what kind of maintenance is needed.				
Operate saws, mills, drill presses, lathes, and grinders while observing appropriate safety rules pertaining to general machine shop practices.				
Explain and demonstrate taper turning, using a dividing or index head, broaching, reading and machining to print, the use of milling attachments, heat treating, metal finishes applications of jigs and fixtures, EDM (Electrical Discharge Machining), cutting feeds and speeds, surface finishes.				
Explain the different classes of fits and how they are related to tolerances.				
Apply trigonometric formulas.				
Explain and demonstrate basic programming and operations of numerical control equipment.				
<b>Problem Solving and Failure Analysis</b>				
Explain the application of problem solving to the design process.				
Analyze and troubleshoot designs.				
Explain why structures fail.				
Describe how data analysis is applied to failure analysis.				