

# Advanced Machine Tool Technology

Career Cluster	Manufacturing
Course Code	
Prerequisite(s)	Algebra 1/Machine Tool Technology
Credit	
Graduation Requirement	No
Program of Study and Sequence	Cluster course – Machine Tool Technology – <b>Advanced Machine Tool Technology</b> – Capstone Experience
Student Organization	Skills USA
Coordinating Work-Based Learning	Field trips/ Speakers
Industry Certifications	National Institute for Metalworking Skills (NIMS)
Dual Credit or Dual Enrollment	Articulated credit available
Teacher Certification	
Resources	OSHA/NIMS

## Course Description:

Advanced Machine Tool Technology students will be introduced to advanced machining processes in the areas of safety, applied math skills and machining operations. The desire is for the student to use basic learned techniques from machine tool technology to obtain higher levels of competency through creation of projects to emulate industry needs.

## Program of Study Application

Advanced Machine Tool Technology is the second pathway course in the Manufacturing cluster, Machining pathway. Machine tool technology is a prerequisite to the Advanced Machining course.

**Course Standards**

**AMT 1 Demonstrate knowledge of safety and essential academic concepts in machine tool.**

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Two Skill/Concept	AMT 1.1 Prove knowledge of shop operations and tool safety procedures consistent with Occupational Safety and Health Administration (OSHA) standards.	<p>Suggested:</p> <ul style="list-style-type: none"> <li>• Demonstrate use of Personal Protective Equipment (PPE).</li> <li>• Identify hazards present in the machine shop.</li> <li>• Test knowledge of safety practices used in the shop.</li> <li>• Identify and recall basic parts to machines</li> <li>• Occupational Safety and Health Administration (OSHA)/Lock out-Tag out/ Safety Data Sheets (SDS)</li> </ul>
Two Skill/Concept	AMT 1.2 Apply advanced concepts, including machine tool mathematics, blueprint reading, science, and communications to machine tool processes.	<p>Suggested:</p> <ul style="list-style-type: none"> <li>• Ability to apply higher level measuring skills.</li> <li>• Calculate machine tool formulas related to various tools and materials.</li> <li>• Distinguish the differences of various materials used.</li> <li>• Ability to produce finished products using working drawings and practices</li> </ul>

Two Skill/Concept	AMT 1.3 Demonstrate and apply computer numerical control (CNC) programming concepts	<p>Suggested:</p> <ul style="list-style-type: none"><li>• Instruction thru use of U-tube or other video presentation.</li><li>• Use of simulation or other software.</li><li>• Apply concepts for completion of part.</li><li>• Identify through use of industry tours and featured speakers.</li></ul>
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**Notes**

**AMT 2 Demonstrate ability through research, development, and implementation to create a project**

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Three Strategic Thinking	AMT 2.1 Design, analyze and create various types of projects utilizing previous knowledge and skills to manufacture a single or assembled project.	<p>Suggested:</p> <ul style="list-style-type: none"> <li>• Research appropriate project ideas to present for approval.</li> <li>• Identify material needs to complete project.</li> <li>• Create or modify drawings in preparation for manufacturing process.</li> <li>• Analyze the manufacturability of the researched part or product.</li> </ul>
Three Strategic Thinking	AMT 2.2 Evaluate and solve issues related to lathe and milling setups and operations.	<p>Suggested:</p> <ul style="list-style-type: none"> <li>• Through completion of required parts.</li> <li>• Show ability to identify and correct problems related to machining operations on project at hand.</li> </ul>

**Notes**

**AMT 3 Demonstrate ethical practices and research career pathways**

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Three Strategic Thinking	AMT 3.1 Identify and demonstrate professional practices used in the machine shop	<p>Suggested:</p> <ul style="list-style-type: none"> <li>• Student handbook.</li> <li>• Local instructor rules.</li> <li>• <a href="http://www.aprahome.org/p/cm/ld/fid=110">http://www.aprahome.org/p/cm/ld/fid=110</a></li> </ul>
Four Extended Thinking	AMT 3.2 Evaluate and describe career exploration activities to follow for a minimum of two different career pathways.	<p>Suggested:</p> <ul style="list-style-type: none"> <li>• Through use of industry tours.</li> <li>• Using featured speakers</li> <li>• Through post-secondary involvement.</li> <li>• Introduction thru use of u-tube or other video presentation.</li> <li>• Internship/job shadowing</li> <li>• Analyze data and develop a report for chosen pathways</li> </ul>

**Notes**