




Machine Tool Technology

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Machine Tool Technology

Content	Skills	Learning Targets	Standards	Assessment	Resources & Technology
<p>CEQ: WHAT ARE THE METAL PROCESSES USED IN THE METALS INDUSTRY?</p> <p>UEQ: <i>•What is this course about and what is expected of students?</i></p> <p>A. Course Introduction A1. Class Outline A2. Grading procedure A3. Metals impact on industry</p>  <p>UEQ: <i>•What are career options in the Machine Tool industry?</i></p> <p>B. Metal's Careers</p>	<p>A. Course Introduction A1-A2. Identify course content and grading. A3. Identify how Metals impact the manufacturing industry</p> <p>B. Metal's Careers B1. Discover careers in Metals manufacturing</p>	<p>A. Course Introduction A1-A2. I can recall from my notebook all course content and grading procedure. A3. I can list 3 ways Metals impact industry</p> <p>B. Metal's Careers B1. I can list 10 different career options in Metals manufacturing.</p>		<p>A. Course Introduction A1-A2. Guided class discussion with observer notes. A3. Each student will list 3 examples of how metals impact our lives.</p>	<p>A. Course Introduction</p> <p>B. Metal's Careers B1. World Wide Web B1. Video "Heavy Metals" History channel production</p>

<p>UEQ: •What is Metal? C. Metal C1. Ferrous C2. Non-ferrous C3. Precious metals </p> <p>UEQ: •What is a project drawing? D. Working drawing types D1. Multi-view D2. Pictorial D3.3d CAD drawings </p> <p>UEQ: •What is Metal shop safety? E. Safety E1. Personal safety E2. Shop/machine safety</p>	<p>C Metal C1-C3. Identify metal samples C1-C3. Identify properties associated with each family of metals.</p> <p>D. Working drawing types D1.Draw a multi-view drawing of a project. D2. Sketch an isometric or oblique drawing of the project. D3.Experiment with computers to create a 3d CAD drawing of the project.</p> <p>E. Safety E1-E2. Recognize potential hazards. E1-E2. Identify</p>	<p>C. Metal C1-C3. I can identify 5 different metal samples. C1-C3. I can describe and list 3 major properties of different metals.</p> <p>D. Working drawing types D1.I can draw a multi-view drawing of a project. D2. I can sketch an isometric or oblique drawing of the project. D3.I can experiment with computers to create a 3d CAD drawing of the project.</p> <p>E. Safety E1-E2. I can recognize potential hazards. E1-E2. I can identify personal and machine/tool safety. E2. I can discuss shop</p>	<p>B. Metal's Careers B1. Career list</p> <p>C. Metal C1-C3. Complete "Introduction to Metals" worksheet. 100 % complete. C1-C3. Each student will identify a metal sample as it is held up in front of the room.</p> <p>D. Working drawing types D1-D3. Successful drawings will meet 80% of the criteria of the drawing rubric.</p>	<p>C. Metal C1-C3. Video "Heavy Metals" History channel production C1-C3. Text reading</p> <p>D. Working drawing types Text reading Computer and Autodesk Inventor</p> <p>E. Safety Text reading Classroom discussion Safety videos</p> <p>F. Measuring/layout</p>
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<p>•What measuring and layout tools are used in the metals industry? F. Measuring/layout tools F1. Digital Micrometer F2. Digital caliper F3. Digital readout devices F4. Siine bar/gage blocks F5. Dial indicator</p> <p>• What hand tools are used in the Metal's industry? G. Hand tools G1. Files G2. Hacksaw G3. Hammers G4. Chisels/punches G5. Taps and dies G6. Wrenches</p>	<p>personal and machine/tool safety. E2. Discuss shop safety.</p> <p>F. Measuring/layout tools F1-F3. Measure objects. F4. Setup an accurate angle using a sine bar and gage blocks. F5. Indicate a vise or part using dial indicators.</p> <p>G. Hand tools G1-G6. Identify tools by name and use. G1-G6. Apply safety rules for hand tools G1-G6. Complete benchworking project using handtools.</p>	<p>safety.</p> <p>F. Measuring/layout tools F1-F3. I can accurately measure objects to .001". F4. I can setup an accurate angle using a sine bar and gage blocks. F5 I can indicate a vise or part using dial indicators.</p> <p>G. Hand tools G1-G6. I can identify tools by name and use. G1-G6. I can use hand tools safely. G1-G6. I can complete benchworking project using handtools. G1-G6. I can demonstrate proper care and use of all hand tools for all subsequent lab projects. G1-G6. I can make use of all hand tools as they apply</p>		<p>E. Safety</p> <p>E1-E3 True/False test. Must pass w95%. Prior to working in the lab, each student will have 3 chances to pass.</p> <p>F. Measuring/layo ut tools F1-F3. Measure accurately to the .001" F1-F3. Demonstrate proper use and care of all measuring tools and equipment. F4. CFA- Work</p>	<p>tools F1-F3 Samples for measurement</p> <p>F1-F5, Worksheets</p> <p>G. Hand tools Handout/ project drawing</p>
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	<p>G1-G6. Demonstrate proper care and use of all hand tools for all subsequent lab projects. G1-G6. Make use of all hand tools as they apply to their project.</p>	<p>to their project.</p>	<p>through the math to setup a sine bar using gage blocks within .001". F5, CFA- Indicate a mill vise within .001"".</p> <p>G. Hand tools G1-G6. Student can accurately discuss hand tools with instructor.</p> <p>G1-G6. Projects are completed within prescribed timeline.</p>	
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October 2014

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<p>•<i>What machines are used for machining metal?</i></p>				

<p>H. Machine tool equipment</p> <ul style="list-style-type: none"> H1. Engine lathe H2. Vertical milling machine H3. Surface grinder H4. CNC (Computer Numerical Controllled) Machining center H5. CNC lathe H6. Drillpress 	<p>H. Machine tool</p> <p>H1-H6. Identify parts for each machine tool.</p> <p>H1-H6. Apply safety rules for each machine tool.</p> <p>H1. Plan and produce work pieces on a manual engine lathe to required blueprint specifications using common industry methods.</p> <p>H2. Plan and produce work pieces on a manual Bridgeport vertical mill to required blueprint specifications using common industry methods.</p> <p>H3. Plan and produce work pieces on a surface grinder to required blueprint specifications using common industry methods.</p> <p>H4-H5. Demonstrate, explain and apply CNC/CAD/CAM machine tools and software to produce work pieces to required blueprint specifications.</p> <p>H6. Plan and produce work pieces on a drillpress to required blueprint specifications using common industry methods.</p>	<p>H. Machine tool</p> <p>H1-H6.I can identify parts for each machine tool.</p> <p>H1-H6. I can apply safety rules for each machine tool.</p> <p>H1. I can plan and produce work pieces on a manual engine lathe to required blueprint specifications using common industry methods.</p> <p>H2. I can plan and produce work pieces on a manual Bridgeport vertical mill to required blueprint specifications using common industry methods.</p> <p>H3. I can plan and produce work pieces on a surface grinder to required blueprint specifications using common industry methods.</p> <p>H4-H5. I can demonstrate, explain and apply CNC/CAD/CAM machine tools and software to produce work pieces to required blueprint specifications.</p> <p>H6. I can plan and produce work pieces on a drillpress</p>	<p>H. Machine tool</p> <p>H1-H6. Student can accurately discuss parts of machines with instructor.</p> <p>H1- H6. Student can successfully complete the projects without injury to self or anyone else.</p> <p>H1-H6.CFA- Projects are completed within prescribed timeline.</p>	<p>H. Machine tool</p> <p>Video "Machine Tool"</p> <p>History channel production</p> <p>Metal engine lathes</p> <p>Vertical milling machines</p> <p>Surface grinder</p> <p>CNC machining center</p>
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		to required blueprint specifications using common industry methods.		
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<p>•How are products developed?</p> <p>I. Product development</p> <p>I1. Product life cycle</p> <p>I2. Research and development</p> <p>I3. Product design</p> <p>I4. Product engineering </p>	<p>I. Product development</p> <p>I1. Describe product life cycle theoretically and in terms of everyday products.</p> <p>I2. Describe research and development.</p> <p>I2-I3. Identify types of research and development methodology.</p> <p>I3. Describe product design.</p> <p>I3. Apply processes of product design to individual's project.</p> <p>I4. Describe product engineering.</p> <p>I3-I4. Apply specific processes of product engineering to individual's project.</p> <p>I1-I4. Prepare appropriate plans,</p>	<p>I. Product development</p> <p>I1. I can describe product life cycle theoretically and in terms of everyday products.</p> <p>I2. I can describe research and development.</p> <p>I2-I3. I can identify types of research and development methodology.</p> <p>I3. I can describe product design.</p> <p>I3. I can apply processes of product design to individual's project.</p> <p>I4. I can describe product engineering.</p> <p>I3-I4. I can apply specific processes of product engineering to individual's project.</p> <p>I1-I4. I can prepare appropriate plans,</p>	<p>I. Product development</p> <p>I1-I4. Student writing - one page essay elaborating on product development as a part of the manufacturing industry.</p> <p>I1-I4. Student participation in class discussion of product development</p> <p>I1-I4. CSA-Designed flow chart for design process.</p> <p>I1-I4. CSA-Design organizational chart of project incorporating key concepts of product development.</p> <p>I1-I4. CSA- Student prepared working drawings of a specific project.</p> <p>I1-I4. CFA- Project</p>	<p>I. Product development</p> <p>Handouts/ sample projects</p> <p>World Wide Web</p> <p>Modern Metalworking-GlencoeWilcox -pages593-606</p>

	drawings for individual's project in keeping with engineering conventions. I1-I4. Construct a major project utilizing all elements of product development.	drawings for individual's project in keeping with engineering conventions. I1-I4. I can construct a major project utilizing all elements of product development.	meets specification of project grading rubric.	
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