



<b>Planned Course: The CAD Creation Lab</b>	<b>Course Number: AH836T</b>	<b>Department: Fine Arts and Digital Arts</b>	
<b>Unit: Generating &amp; Refining Ideas</b>	<b>Grade Level: 9-12</b>		
<b>Estimated Time: 7 weeks (Integrated)</b>	<b>Level/Track: Elective</b>	<b>Board Approval Date: 08/08/2016</b>	
<b>PA Academic Standards</b>	<b>▶ Core Concepts (in question format)</b> • Skills/Knowledge	<b>Activities/Strategies/Study Skills</b> (identify some activities as remedial or enrichment activities)	<b>Assessments</b> (include types and topics)

<p><b>3.1.12.A: Apply concepts of systems, subsystems, feedback and control to solve complex technological problems.</b></p> <ul style="list-style-type: none"> <li>• Apply knowledge of control systems concept by designing and modeling control systems that solve specific problems.</li> <li>• Apply systems analysis to predict results.</li> <li>• Analyze and describe the function, interaction and relationship among subsystems and the system itself.</li> <li>• Evaluate the causes of a system's inefficiency.</li> </ul> <p><b>3.1.12.C: Assess and apply patterns in science and technology.</b></p> <ul style="list-style-type: none"> <li>• Assess and apply recurring patterns in natural and technological systems.</li> </ul> <p><b>3.1.12.D: Analyze scale as a way of relating concepts and ideas to one another by some measure.</b></p> <ul style="list-style-type: none"> <li>• Compare and contrast various forms of dimensional analysis.</li> <li>• Assess the use of several units of measurement to the same problem.</li> <li>• Analyze and apply appropriate measurement scales when collecting data.</li> </ul> <p><b>3.1.12.E: Evaluate change in nature, physical systems and man made systems.</b></p> <ul style="list-style-type: none"> <li>• Analyze how models, systems and</li> </ul>	<p>▶ How far do you go when revising work based upon the client/someone else's comments?</p> <ul style="list-style-type: none"> <li>• Integrity of original design</li> <li>• Clarity</li> <li>• Creativity</li> <li>• Structural Design Integrity</li> </ul> <p>▶ Does your background/age influence the choices you make when designing your projects?</p> <ul style="list-style-type: none"> <li>• Changing Interests</li> <li>• Life Experiences</li> </ul> <p>▶ How/Why will learning how to create finished CAD projects help you in the future?</p> <ul style="list-style-type: none"> <li>• Intro to Software, Techniques &amp; Terminology</li> <li>• Understanding the benefits of Trial and Error</li> <li>• Practice</li> <li>• Drawing to Scale</li> <li>• Working as a Team</li> </ul> <p>▶ What influence peoples' purchasing?</p> <ul style="list-style-type: none"> <li>• Life Experiences</li> <li>• Interests</li> </ul>	<ul style="list-style-type: none"> <li>• Students will read the objectives of a given project and watch and/or listen to a related demo, which will explain the problem that needs to be solved and point them on the right path.</li> <li>• Students will analyze and research (as necessary) the problem further and identify current solutions available.</li> <li>• Students will brainstorm ideas in "spiderweb" diagram and/or list form to generate a starting point that will lead to a unique (if required) solution of their own.</li> <li>• Students will pick pieces that interest them and work on a small portfolio of thumbnail sketches that convey their solutions (in pencil on newsprint).</li> <li>• Ongoing independent consultations with the instructor throughout this entire unit will allow students</li> </ul>	<ul style="list-style-type: none"> <li>• On an individual basis both informal (ongoing) and formal (for points) critiques/assessments will be given for sketches/drawings in keeping with the requirements listed for each project.</li> </ul>
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<p>technologies have changed over time.</p> <ul style="list-style-type: none"> <li>• Evaluate the patterns of change within a technology (e.g., changes in engineering.</li> </ul> <p><b>3.2.12.C: Apply the elements of scientific inquiry to solve multi-step problems.</b></p> <ul style="list-style-type: none"> <li>• Generate questions about objects, organisms and/or events that can be answered through scientific investigations.</li> <li>• Evaluate the appropriateness of questions.</li> <li>• Design an investigation with adequate control and limited variables to investigate a question.</li> <li>• Organize experimental information using analytic and descriptive techniques.</li> <li>• Evaluate the significance of experimental information in answering the question.</li> <li>• Project additional questions from a research study that could be studied.</li> </ul> <p><b>3.2.12.D: Analyze and use the technological design process to solve problems.</b></p> <ul style="list-style-type: none"> <li>• Implement and assess the solution.</li> <li>• Evaluate and assess the solution, redesign and improve as necessary.</li> <li>• Communicate and assess the process and evaluate and present the impacts of the solution.</li> </ul> <p><b>3.7.12.B: Evaluate appropriate</b></p>	<ul style="list-style-type: none"> <li>• Prior Knowledge</li> <li>• Summary/Reviews</li> <li>• Cost</li> <li>• Quality</li> </ul>	<p>to illustrate and explain their solutions and examine and predict the level of success of each outcome (remedial and/or enrichment depending upon the level of project they choose).</p> <ul style="list-style-type: none"> <li>• Students will refine the sketches into one comprehensive sketch that details their solution.</li> <li>• Students will research measurements necessary to draw their solution to scale.</li> <li>• A demonstration will be given on how to draw things in an orthogonal manner.</li> <li>• The comprehensive sketch will then be drawn to scale on grid paper in orthogonal form depicting the elevation (side), top, bottom, front and back views of the solution.</li> <li>• A demonstration will be given on how to draw items in a flat manner with tabs so that</li> </ul>	
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<p><b>instruments and apparatus to accurately measure materials and processes.</b></p> <ul style="list-style-type: none"> <li>• Apply and evaluate the use of appropriate instruments to accurately measure scientific and technologic phenomena within the error limits of the equipment.</li> <li>• Evaluate the appropriate use of different measurement scales (macro and micro).</li> <li>• Evaluate the utility and advantages of a variety of absolute and relative measurement scales for their appropriate application.</li> </ul> <p><b>3.8.12.A: Synthesize and evaluate the interactions and constraints of science and technology on society.</b></p> <ul style="list-style-type: none"> <li>• Compare and contrast how scientific and technological knowledge is both shared and protected.</li> <li>• Evaluate technological developments that have changed the way humans do work and discuss their impacts (e.g., genetically engineered crops).</li> <li>• Evaluate socially proposed limitations of scientific research and technological application.</li> </ul> <p><b>3.8.12.B: Apply the use of ingenuity and technological resources to solve specific societal needs and improve the quality of life.</b></p>		<p>it can be put together in 3D.</p> <ul style="list-style-type: none"> <li>• The solution will also be drawn to scale in a flat manner with tabs. A scale mockup will be cut out and fastened together to check the validity of the solution.</li> <li>• These steps will be repeated and refined as necessary until they are accurate and valid (remedial/enrichment as necessary).</li> </ul>	
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<ul style="list-style-type: none"> <li>• Apply appropriate tools, materials and processes to solve complex problems.</li> <li>• Use knowledge of human abilities to design or modify technologies that extend and enhance human abilities.</li> </ul>	<ul style="list-style-type: none"> <li>• Skills/Knowledge</li> </ul>		