



<b>Planned Course: Imagineering Workshop</b>		<b>Course Number: AH844T</b>	<b>Department: Fine &amp; Digital Arts</b>
<b>Unit: 3: Research &amp; Self-Directed Learning</b>		<b>Grade Level: 9-12</b>	
<b>Estimated Time: 5 weeks Integrated</b>		<b>Level/Track: Elective</b>	<b>Date Approved: August 27, 2018</b>
<b>PA Academic Standards</b>	<ul style="list-style-type: none"> <li>▶ <b>Core Concepts (in question format)</b> <ul style="list-style-type: none"> <li>• Skills/Knowledge</li> </ul> </li> </ul>	<b>Activities/Strategies/Study Skills (identify some activities as remedial or enrichment activities)</b>	<b>Assessments (include types and topics)</b>

<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 systems analysis to predict results.</li> <li>• Compare and contrast several systems that could be applied to solve a single problem.</li> <li>• Evaluate the cause of a system's inefficiency.</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>• 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>• Evaluate the patterns of change within a technology (e.g., changes in engineering).</li> </ul> <p><b>3.2.12. A: Evaluate the nature of scientific and technological knowledge.</b></p> <ul style="list-style-type: none"> <li>• Know and use the ongoing scientific processes to continually improve and better understand how things work.</li> <li>• Critically evaluate the status of</li> </ul>	<ul style="list-style-type: none"> <li>▶ What is Self-Directed Learning &amp; why is it important?</li> <li>▶ What is research and why is it necessary in ALL instances? <ul style="list-style-type: none"> <li>• How does one go about starting to research an idea?</li> <li>• What kinds of research are valid?</li> </ul> </li> <li>▶ Why is it always important to know where something will end up (the end use(s)) before you start a project? <ul style="list-style-type: none"> <li>• How does one output the items? Requirements for output?</li> <li>• Is it a physical item or an idea/concept?</li> <li>• How does one package the idea/project?</li> <li>• What is the terminology necessary for this particular project?</li> </ul> </li> <li>▶ Why is accuracy important in every endeavor in life – not just math?</li> </ul>	<ul style="list-style-type: none"> <li>• Students will refine the sketch/idea into one specific sketch/idea for a project or to solve a problem that requires a solution.</li> <li>• Students will research methods and processes necessary to complete their project/find their solution.</li> <li>• Students will undergo independent learning in the methods and processes that their research deems necessary to complete their project/find their solution.</li> <li>• Students will import, explain/caption and organize all notes and all digital files in their digital Learning Journal allowing them to keep a digital trail of their journey.</li> <li>• Ongoing independent consultations with the instructor throughout this entire unit will allow students to illustrate and explain their</li> </ul>	<ul style="list-style-type: none"> <li>• This unit will be assessed formally by observing the progress in student Learning Journals.</li> <li>• The instructor will also informally observe and mentor students while they are working in the classroom in order to provide on the spot feedback and motivation or direction.</li> <li>• Informal assessment will also be observed and directed by the instructor upon seeing the demonstration of skills students are employing during their self-directed learning process and practice.</li> <li>• Peer mentoring (as appropriate) will also be highly encouraged (and informally assessed) to foster a family atmosphere and aid both parties in retaining their knowledge on a higher level.</li> </ul>
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<p>existing theories (e.g., germ theory of disease, wave theory of light, classification of subatomic particles, theory of evolution, epidemiology of aids).</p> <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> </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>• Assess all aspects of the problem, prioritize the necessary information and formulate questions that must be answered.</li> <li>• Propose, develop and appraise the best solution and develop alternative solutions.</li> </ul> <p><b>3.6.12. B: Analyze knowledge of information technologies of processes encoding, transmitting, receiving, storing, retrieving and</b></p>		<p>solutions and examine and predict the level of success of each outcome (remedial, new learning and/or enrichment depending upon the level of project they choose).</p>	
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<p><b>decoding.</b></p> <ul style="list-style-type: none"> <li>• Analyze and evaluate a message designed and produced using still, motion and animated communication techniques.</li> </ul> <p><b>3.6.12.C: Analyze physical technologies of structural design, analysis and engineering, personnel relations, financial affairs, structural production, marketing, research and design to real world problems.</b></p> <ul style="list-style-type: none"> <li>• Apply knowledge of construction technology by designing, planning and applying all the necessary resources to successfully solve a construction problem.</li> <li>• Compare resource options in solving a specific manufacturing problem.</li> <li>• Analyze and apply complex skills needed to process materials in complex manufacturing enterprises.</li> <li>• Apply advanced information collection and communication techniques to successfully convey solutions to specific construction problems.</li> <li>• Analyze the positive and negative qualities of several different types of materials as they would relate to specific construction applications.</li> </ul> <p><b>3.7.12. A: Apply advanced tools, materials and techniques to answer complex questions.</b></p>			
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<ul style="list-style-type: none"> <li>• Demonstrate the safe use of complex tools and machines within their specifications.</li> <li>• Select and safely apply appropriate tools, materials and processes necessary to solve complex problems that could result in more than one solution.</li> <li>• Evaluate and use technological resources to solve complex multistep problems.</li> </ul> <p><b>3.7.12. D: Evaluate the effectiveness of computer software to solve specific problems.</b></p> <ul style="list-style-type: none"> <li>• Evaluate the effectiveness of software to produce an output and demonstrate the process.</li> <li>• Analyze, select and apply the appropriate software to solve complex problems.</li> <li>• Analyze the legal responsibilities of computer users.</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> </ul>					
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<ul style="list-style-type: none"> <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> <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> <p><b>3.8.12. C: Evaluate the consequences and impacts of scientific and technological solutions.</b></p> <ul style="list-style-type: none"> <li>Propose solutions to specific scientific and technological applications, identifying possible financial considerations.</li> <li>Analyze scientific and technological solutions through the use of risk/benefit analysis.</li> <li>Evaluate and describe potential impacts from emerging technologies and the consequences of not keeping abreast of technological advancements (e.g., assessment alternatives, risks, benefits, costs, economic impacts, constraints).</li> </ul>			
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