


Planned Course: The CAD Creation Lab	Course Number: AH836T	Department: Fine Arts and Digital Arts	
Unit: CAD-Modelspace	Grade Level: 9-12		
Estimated Time: 10 weeks (Integrated)	Level/Track: Elective	Board Approval Date: 08/22/2016	

PA Academic Standards	Core Concepts (in question format) • Skills/Knowledge	Activities/Strategies/Study Skills (identify some activities as remedial or enrichment activities)	Assessments (include types and topics)
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<p>3.1.12.A: Apply concepts of systems, subsystems, feedback and control to solve complex technological problems.</p> <ul style="list-style-type: none"> • Apply knowledge of control systems concept by designing and modeling control systems that solve specific problems. • Apply systems analysis to predict results. <ul style="list-style-type: none"> • Analyze and describe the function, interaction and relationship among subsystems and the system itself. • Evaluate the causes of a system's inefficiency. <p>3.1.12.B: Apply concepts of models as a method to predict and understand science and technology.</p> <ul style="list-style-type: none"> • Evaluate technological processes by collecting data and applying mathematical models (e.g., process control). • Apply knowledge of complex physical models to interpret data and apply mathematical models. <p>3.1.12.D: Analyze scale as a way of relating concepts and ideas to one another by some measure.</p> <ul style="list-style-type: none"> • Compare and contrast various forms of dimensional analysis. <ul style="list-style-type: none"> • Assess the use of several units of measurement to the same problem. • Analyze and apply appropriate measurement scales when collecting data. 	<p>▶ How is translating a hand-drawn blueprint into a CAD program similar to learning a new language?</p> <ul style="list-style-type: none"> • Specific Terminology • Developing a Working Rhythm <ul style="list-style-type: none"> • There are Different Dialects (software packages) within the Language. <p>▶ What are the pros/cons regarding hand-drawn blueprints vs. CAD drawn blueprints?</p> <ul style="list-style-type: none"> • Ability to Print vs. Copy • Ability to Make Large Changes Quickly • Ability to convert to 3D and Rotate in Space <p>▶ How can working with this type of software program help you in your future endeavors – regardless of your future major/job emphasis?</p> <ul style="list-style-type: none"> • Ability to Follow Directions <ul style="list-style-type: none"> • Practicing Accuracy & Patience • Introduction to Technical 	<ul style="list-style-type: none"> • The topics and tools listed below will be demonstrated via projection system (mainly during the first quarter of the school year) in short segments. • Students will be following along on their own computers for practice, which will demonstrate their understanding and provide immediate feedback for the instructor who will then tailor the subsequent demonstrations to fulfill those needs. • Students will write down notes as they feel necessary in a digital notebook as we go along. • All of the following will be completed in MODELSPACE as opposed to PAPERSPACE. <ol style="list-style-type: none"> a) Discussing just what is 'modelspace'? b) Discussing the CAD interface and how it works (menus, tool palettes, command line, status bar & view cube) 	<ol style="list-style-type: none"> 1) Formal assessment will be utilized to record accuracy and completion of an abundance of short worksheets and classwork assignments that will be used to practice all of the concepts and tools listed in the activities section. These worksheets and classwork assignments pertain to roughly the first quarter of the school year. 2) The instructor will also informally observe and mentor students while they are working with all of the concepts and tools in 'modelspace' on their large projects throughout the remaining ¾ of the year. 3) Peer mentoring 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. 4) This unit will be partially assessed informally by
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<p>3.2.12.D: Analyze and use the technological design process to solve problems.</p> <ul style="list-style-type: none"> • Implement and assess the solution. • Evaluate and assess the solution, redesign and improve as necessary. • Communicate and assess the process and evaluate and present the impacts of the solution. <p>3.6.12.B: Analyze knowledge of information technologies of processes encoding, transmitting, receiving, storing, retrieving and decoding.</p> <ul style="list-style-type: none"> • Apply and analyze advanced information techniques to produce a complex image that effectively conveys a message (e.g., desktop publishing, audio and/or video production). • Apply various graphic and electronic information techniques to solve real world problems (e.g., data organization and analysis, forecasting, interpolation). <p>3.7.12.A: Apply advanced tools, materials and techniques to answer complex questions.</p> <ul style="list-style-type: none"> • Demonstrate the safe use of complex tools and machines within their specifications. • Select and safely apply appropriate tools, materials and processes necessary to solve complex problems that could result in more than one 	<p>Terminology and ideas</p> <ul style="list-style-type: none"> • Heavy Computer Usage/Practice <p>▶ What is ‘modelspace’?</p> <ul style="list-style-type: none"> • ‘modelspace’ vs. ‘paperspace’ 	<ul style="list-style-type: none"> c) Defining and creating new drawings (scale, units, paper size) and saving them d) The definition, use, and creation of templates e) Drawing Basic Shapes (Lines, Circles, Rectangles) and erasing and undoing them f) Defining and practicing the Cartesian Coordinate system (Absolute, Relative and Polar Coordinates) g) Identifying and Utilizing Options to Make Drawing Easier (Ortho, Grid, Polar Tracking, Snap, OSNAPs, Running OSNAPs, settings, Point Filters and Object Snap Tracking) h) Defining and practicing the use of Zoom, Pan, Extents i) Creating Arcs & Polygons j) Definition, Use and Creation of Annotative Text (‘simple’ text) 	<p>observing the quantity of reprints necessary due to incorrect drawing accuracy.</p> <p>5) The end products will also be assessed formally as a part of each project’s overall formal assessment after it is built/produced and handed in (refer to the Production unit for grading the rubric).</p>
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<p>solution.</p> <ul style="list-style-type: none"> • Evaluate and use technological resources to solve complex multistep problems. <p>3.7.12.C: Evaluate computer operations and concepts as to their effectiveness to solve specific problems.</p> <ul style="list-style-type: none"> • Describe and demonstrate atypical software installation. • Analyze and solve hardware and advanced software problems. • Assess and apply multiple input and output devices to solve specific problems. <p>3.7.12.D: Evaluate the effectiveness of computer software to solve specific problems.</p> <ul style="list-style-type: none"> • Evaluate the effectiveness of software to produce an output and demonstrate the process. • Design and apply advanced multimedia techniques. • Analyze, select and apply the appropriate software to solve complex problems. • Evaluate the effectiveness of the computer as a presentation tool. • Analyze the legal responsibilities of computer users. 		<ul style="list-style-type: none"> k) Identify and Practice changing Object Properties (changing color, line type, line weight, transparency) l) Definition, Use and Creation of Layers m) The definition and use of GRIPS! n) Editing Drawings (Copy, Move, Offset, Array, Align, Add Selected, Mirror, Trim, Extend, Break, Fillet, Chamfer, Lengthen, Stretch, Rotate, Group. o) Definition and Use of Measurement tools p) Definition and Use of Dimensioning tools q) Creating, Placing and Aligning Leaders r) Creating Polylines s) Definition and Use of Hatching t) Definition and Use of Blocks u) Definition and Use of Multiline Text (MText) v) Demonstration and Creation of Isometric 	
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		<p>Drawing</p> <p>w) Demonstration and Creation of Orthogonal Drawing</p> <p>x) Investigating Z-axis drawing (to create a third dimension) will be visited if there is time and further interest from the class in the spring. (Z-space, the View Cube, 3D coordinate entry, Thickness and Elevation, Wireframes and Surface Modeling, Using Meshes, WCS vs. UCS, Solid Modeling and editing)</p>	
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