

Course Title – Drafting and Design	
Implement start year – 2018-2019	
Revision Committee Members – Stef Kirk skirk@lrhsd.org x8314 Carl Kralik ckralik@lrhsd.org x8595 Jason Pitner jpitner@lrhsd.org x8177 Erika Rakow erakow@lrhsd.org x8613	
Unit # 2 – Intro to Computer Aided Drafting (CAD)	
Transfer Goal – Students will be able to independently and efficiently create accurate drawings using Computer Aided Drawing (CAD) Software.	
Stage 1 – Desired Results	
<u>Established Goals</u> <u>2014 New Jersey Student Learning Standards, Strand(s)/CPI #</u>	<u>21st Century Themes</u> (<u>www.21stcenturyskills.org</u>)
8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.	<input checked="" type="checkbox"/> Global Awareness <input type="checkbox"/> Financial, Economic, Business and Entrepreneurial Literacy <input type="checkbox"/> Civic Literacy <input type="checkbox"/> Health Literacy <input checked="" type="checkbox"/> Environmental Literacy

<p>8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.</p> <p>C. Design: The design process is a systematic approach to solving problems.</p> <ul style="list-style-type: none"> 8.2.12.C.7 Use a design process to devise a technological product or system that addresses a global problem, provide research, identify trade-offs and constraints, and document the process through drawings that include data and materials. <p>9.1 21st-Century Life & Career Skills All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.</p> <p>9.1.12.A.1 Apply critical thinking and problem-solving strategies during structured learning experiences.</p>	<p style="text-align: center;">21st Century Skills</p> <p><i>Learning and Innovation Skills:</i> <input checked="" type="checkbox"/> Creativity and Innovation <input checked="" type="checkbox"/> Critical Thinking and Problem Solving <input checked="" type="checkbox"/> Communication and Collaboration</p> <p><i>Information, Media and Technology Skills:</i> <input checked="" type="checkbox"/> Information Literacy <input checked="" type="checkbox"/> Media Literacy <input checked="" type="checkbox"/> ICT (Information, Communications and Technology) Literacy</p> <p><i>Life and Career Skills:</i> <input checked="" type="checkbox"/> Flexibility and Adaptability <input checked="" type="checkbox"/> Initiative and Self-Direction <input checked="" type="checkbox"/> Social and Cross-Cultural Skills <input checked="" type="checkbox"/> Productivity and Accountability <input checked="" type="checkbox"/> Leadership and Responsibility</p>
<p><u>Enduring Understandings:</u> <i>Students will understand that . . .</i></p> <p><i>EU 1</i> CAD is used to draw and communicate ideas and objects.</p> <p><i>EU 2</i> CAD has advantages over manual drafting.</p>	<p><u>Essential Questions:</u></p> <p><i>EU 1</i></p> <ul style="list-style-type: none"> How has technology impacted the design field? How would various careers benefit from the use of CAD? <p><i>EU 2</i></p> <ul style="list-style-type: none"> When would a designer choose manual drafting over a drawing using CAD? How is CAD used in place of mechanical drawing? Why is it beneficial to have an electronic copy of a drawing?

<p>Knowledge: Students will know . . .</p> <p><i>EU 1</i></p> <ul style="list-style-type: none"> • the user interface of CAD. • CAD commands, such as: line, trim, offset, arc, circle, array. • different CAD techniques to create a drawing such as: command input (keyboard vs mouse), drawing aids (snaps/ortho). <p><i>EU 2</i></p> <ul style="list-style-type: none"> • the advantages of CAD such as: ease of modifications, file sharing, precision, efficiency. 	<p>Skills: Students will be able to . . .</p> <p><i>EU 1</i></p> <ul style="list-style-type: none"> • locate features within the user interface. • save a drawing in a specific location. • utilize CAD to reproduce an existing drawing. • Illustrate an understanding of the coordinate system. • apply absolute/polar/relative commands. • enter commands in AutoCAD. • use CAD drawing aids • edit a drawing and add more information to it. <p><i>EU 2</i></p> <ul style="list-style-type: none"> • compare/contrast advantages of CAD vs manual drafting. • create a drawing more efficiently on CAD compared to by hand.
<p>Stage 2 – Assessment Evidence</p>	
<p>Other Recommended Evidence:</p> <ul style="list-style-type: none"> • Design Challenges • Teacher observations • Project rubric(s) • Worksheets • Quizzes/tests • CAD Drawing Packets • Engineering notebook 	

Stage 3 – Learning Plan

Suggested Learning Activities to Include Differentiated Instruction and Interdisciplinary Connections:

- Teacher led discussions about CAD uses, functions, and real-world applications (A)
- User interface worksheet (A,M)
- Master Command List Worksheet (A,M)
- Teacher led discussions on the proper CAD techniques (A)
- Practice new CAD skillsets (M)
- Demonstrate proper CAD commands by completing various basic drawings (M, T)
- Reproduce technical one-view drawings (M)
- Step-by-Step American Flag Drawing (A,M)
- Step-by-Step Pink Panther Drawing (A,M)
- Demo-a-Day (explaining a command each day) (A)
- Question-a-Day (posting EQ on the board) (A)
- Teacher led review/discussion on the Engineering Design Process (A)
- Logo Design Project (M,T)
- Teacher created Design Challenges using the engineering design process (M, T)