



Mastery Learning Goals	4 EXCEEDS MASTERY	3 MASTERY	2 REACHING MASTERY	1 BASIC
MASTERY LEARNING GOAL - The identified capstone benchmarks have been operationalized as capstone mastery learning goals that describe clearly the expected student performance aligned to the benchmarks. These Mastery Learning Goals will be plugged into project rubrics.	UNIT RUBRIC - The capstone's mastery learning goals are deconstructed and represented in a rubric that describes clear, scaffolded performance criteria for the demo of mastery learning, as well as, learning that goes beyond mastery, approaches mastery, or is basic to mastery			
MATH PROC 8-10 F, G How can students use precise mathematical language and notations to write clearly and coherently about the mathematics involved in creating a sound communication system.	Student researches and writes clearly about how mathematics is used to create different types of communication systems and includes this writing in the individual final report.	Student clearly and coherently writes about the mathematics involved in creating a sound communication system and includes all vital aspects and includes this piece of writing in the individual final report.	Student can clearly write about the mathematics involved in sound communication, but does not include all vital aspects and includes this piece of writing in the individual final report.	Student can demonstrate an understanding that mathematics plays a viable role in communication and includes this piece of writing in the individual final report.
ENG LTRY 8-10 E, F How can students Analyze the use of a genre to express a theme or topic and identify and analyze how an author uses figurative language, sound devices and literary techniques to shape plot, set meaning and develop tone? ENG WRTP 8-10 E. How can you apply tools to judge writing?	Poetry is written in lyric form and fits the format of the musical composition end product. Poetry is exceptionally written in approved size and style font. Student uses Figurative language, sound devices and literary techniques. Writer makes no errors in grammar or spelling that distract the reader from the content.	Poetry is written in lyric form and fits the format of the musical composition end product. Poetry is written in approved size and style font. Student uses some literary techniques. Writer makes 1-2 errors in grammar or spelling that distract the reader from the content.	Poetry is written. Student uses few literary techniques. Writer makes 3-4 errors in spelling or grammar that distract the reader from the content.	Poetry is handwritten. Student uses no literary techniques. Writer makes more than 4 errors in spelling and grammar.
ENG WRTA 11-12 C How can students produce a functional document that reports, organizes and conveys information and ideas accurately, forseees reader problems or misunderstandings, and includes formatting techniques that are user friendly?	All required elements of manual are present and answered in a factual, meaningful manner. Manual includes whether the findings supported, possible sources of error, and what was learned from the experiment. The writer seems to be writing from knowledge or experience.	All required elements are of manual are present. Manual includes findings supported the hypothesis and what was learned from the experiment. The writer seems to be drawing on knowledge or experience, but there is some lack of ownership of the topic.	One required element of manual is missing. Manual includes what was learned from the experiment. The writer relates some of his own knowledge or experience, but it adds nothing to the discussion of the topic.	Several required elements of Manual are missing. No conclusion was included in the report OR shows little effort and reflection. The writer has not tried to transform the information in a personal way. The ideas and the way they are expressed seem to belong to someone else.
PHYS 9-10 F How is energy conserved?	Student can create an extension of the parabolic transceiver that transforms the energy in the system into another energy form	Student can student can map the transitions between energy forms and the flow of energy in detailed schematics and circuit diagrams. This is present in the manual.	Student can identify vehicle of energy transport in project	Student can identify types of energy present in project
PHYS 9-10 G What are the features and properties of waves?	Student can develop an original demonstration of wave behavior	Student can calculate the amplitudes and describe the interactions that waves have as they interfere. These results are reported in the manual.	Student can compute the properties of interfering waves	Student can label the various parts of a wave
PHYS 9-10 G How are frequency and wavelength related in instruments?	Student can create and tune an instrument to produce a specific range of frequencies	Student constructs an instrument and can tune it to at least one specific frequency	Student can identify that wavelength and frequency are inversely proportional	Student can label the various parts of a wave
INQR 9-10 A, KNWG 9-10 B, KNWG 11-12 A What is the scientific process for creating a tuned instrument?	Student can create a procedure specific to creating and tuning an instrument	Student can tune the instrument to at least one specific frequency using a skill set based on observation, hypothesis, and questioning	Student can correlate the wavelength of a sound wave to a dimension on a stringed instrument	Student can test an instrument to determine the frequency at which at least one note resonates
EGR 3.6, Explain and apply the fundamentals of engineering and science drawings, schematics, specifications and diagrams: Production of schematics, 6-view and 3D drawings.	Demonstrated ability to produce a neat, professional schematic drawing of an amplifier, transducer or light fixture using accepted symbols, adding components to the original design.	Ability to produce a neat, accurate and professional looking schematic drawing of a working amplifier, transducer or light fixture using accepted symbols.	Student has the ability to produce a schematic drawing representing and amp, transducer or light fixture using basic drawing tools or freehand.	Understanding of the purpose of a schematic drawing with a rudimentary grasp of what the symbols represent. Attempt at successful schematic drawing.
EGR 11.1, Apply the steps of the design process to solve a variety of design problems: Construction of an working electrical component.	Successful application of design principles in construction of a working amplifier, transducer or light fixture from on original schematic rendering creatively using components not found in the initial assignment.	Successful construction of a working amplifier, transducer or light fixture employing engineering and scientific principles, true to schematic and drafting renderings.	Construction of an amplifier, transducer or light fixture, true to schematics and drafting. Operational but intermittent due to cold solders, poor connections or faulty components.	Completion of construction of an amplifier, transducer or light fixture. Non operational for reasons to be determined by student by various diagnostic means.
EGR 2.13, Demonstrate the effective use of technology: Use of electronic test equipment, multi-meters and other diagnostic instruments.	Demonstrated proficiency with various types of electronic test equipment. Ability to make predictions and analysis combining mathematical and engineering principles with data obtained.	Proficiency with various types of electronic test equipment. Working knowledge of all facets of instruments including grasp of all functions and terminology.	Demonstrated skill with electronic test equipment with a rudimentary grasp of functions and terminology. Not completely versed on all aspects of equipment.	Basic knowledge of what various types of electronic test does. Lacking understanding of the hows and whys of diagnostic testing and analyzing. Lacking complete command of terminology.
EGR 1.5, Employ critical thinking and problem solving skills independently or in teams to formulate solutions to problems: Principles, Theories, Rules, Laws, Formulas pertaining to engineering design and implementation	Firm command of all theories, Laws, Formulas and Terminology that was presented. Ability to apply these into models or working, operational examples. Also, manifestation in demonstrated skill in the application of what was learned in the abstract form.	Full understanding of all theories, formulas, etc. that allows student to write and discuss with full confidence. Ability to apply what was learned to projects and assign ments with success.	Working understanding of material presented in class and discovered in projects and assignments. Inability to transfer this knowledge into operational applications due to lack of full grasp of all nuances of subject.	Lack of understanding of the fundamentals of a subject due to missing components in the linear learning of the subject. Ability to grasp rudimentary aspects of various concepts but lacking complete comprehension.
SS SKLS 9-10 A. How can students detect bias and propaganda in primary and secondary sources?	Students will create a marketing campaign, specific to a 1940s American audience, that is truthful in expressing what their product does.	Students will create a marketing campaign that is truthful in expressing what their product does. The campaign also explains why the consumer should purchase it.	Students will create a marketing campaign that is truthful in expressing what their product does.	Students will create a marketing campaign that includes inaccuracies.
SS PEPL 9-10 C. How can advances in communication and transportation impact cooperation and conflict?	Students will complete a manual that include a glossary of terms that accurately communicates technical terminology and jargon, including references to modern culture and historical context. Historical research is well thought out and evident.	Students will complete a manual that accurately communicates technical terminology and jargon, including references to modern culture and historical context.	Students will complete a manual that accurately communicates technical terminology but fails to refer to jargon. Minimal references to modern culture and historical context exist.	Student will complete a manual, with minimal to no references to modern culture or historical context.
Art History 9-12 D Select a culture and create an original work of art that demonstrates understanding of a historical, social or political issues of the culture.	Student will draw illustrations for a manuals showing clarity of the diagram as well as using historical references but also add a different languages or symbols	Student will draw illustrations for a manuals showing clarity of the diagram as well as using historical references	Student will create drawings or sketches but have a disconnect with demonstrating cultural/politically/social references/ideas for their manual/technical illustrations	Student can create an general drawing using limited knowledge
Art Aesthetics 9-12 C Judge the merit of selected artworks and provide the aesthetic basis for their positions.	Student will demonstrate how to apply the aesthetic rules by using the principles of art and design to qualify good judgment on final products by (light display, logo and marketing products) plus building forms	Student will understand and synthesize the abilities to judge using the principles of art and design to decide... what is art? but also judge the final piece (light display) by constructing the criteria for a forms	Student are grasping the concept of judging art but not connecting using the principles of art and design to decide...what is art?	Not showing the understanding nor the concepts of the principles of art to judge works of art
Art APPL 9-12 B Formulate and solve a visual art problems using strategies and perspectives from other disciplines.	Student will be creating a work of art to house a light display box by graphic design (CAD). The designs are carved into a box by using the laser machine using the knowledge of science, engineering and math. The student will creating a logo, business cards, and creative marketing for products (Business cards, logo and t-shirt). Students have gone beyond by adding a cultural perspective but also another dimension it's made futuristically too.	Students will create a housing component for light display that is aesthetically pleasing, and incorporates functional dimensions learned in engineering, math and science class, as well as historical reference and grammar from English and social studies. In addition to creating a logo, business card and packaging for the light display.	Student will be able to create designs by sketching but fails to use the graphic component accurately. Students are not transferring the knowledge proficiency from other disciplines Eng Ela Science & Math into the design	Student can not define sketches nor apply other perspectives such as Science, Eng., Ela, & Math