

Course: *Capstone in Metalworking*
Unit #: 4 - *Reflection and Presentation*

Year of Implementation: 2024-2025

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Stage One - Desired Results

Link(s) to New Jersey Student Learning Standards for this course:

<https://www.state.nj.us/education/cccs/2020/>

<https://www.state.nj.us/education/cccs/2020/2020%20NJSLS-CLKS.pdf>

https://www.nj.gov/education/standards/ela/Docs/2016NJSLS-ELA_Companion9-10.pdf

https://www.nj.gov/education/standards/ela/Docs/2016NJSLS-ELA_Companion11-12.pdf

- **Unit Standards:** *(keep each of the following headings in place)*
 - **21st Century Life & Career Standards**
 - 9.3.MN-PPD.3 Monitor, promote and maintain a safe and productive workplace using techniques and solutions that ensure safe production of products.
 - 9.3.MN-QA.3 Coordinate work teams to create a product that meets quality assurance standards.
 - 9.3.MN-QA.4 Employ project management processes using data and tools to deliver quality, value-added products.
 - **English Companion Standards**
 - RI.9-10.7. Analyze various perspectives as presented in different mediums (e.g., a person's life story in both print and multimedia), determining which details are emphasized in each account.
 - *WHST.9-10.10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences*
 - **Interdisciplinary Content Standards**
 - RI.9-10.7. Analyze various perspectives as presented in different mediums (e.g., a person's life story in both print and multimedia), determining which details are emphasized in each account.
 - NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content

- ***NJ Statutes:*** NJ State law mandates the inclusion of the following topics in lesson design and instruction as aligned to elementary and secondary curriculum.

Amistad Law: N.J.S.A. 18A 52:16A-88 Every board of education shall incorporate the information regarding the contributions of African-Americans to our country in an appropriate place in the curriculum of elementary and secondary school students.

Holocaust Law: N.J.S.A. 18A:35-28 Every board of education shall include instruction on the Holocaust and genocides in an appropriate place in the curriculum of all elementary and secondary school pupils. The instruction shall further emphasize the personal responsibility that each citizen bears to fight racism and hatred whenever and wherever it happens.

LGBT and Disabilities Law: N.J.S.A. 18A:35-4.35 A board of education shall include instruction on the political, economic, and social contributions of persons with disabilities and lesbian, gay, bisexual, and transgender people, in an appropriate place in the curriculum of middle school and high school students as part of the district's implementation of the New Jersey Student Learning Standards (N.J.S.A. 18A:35-4.36) A board of education shall have policies and procedures in place pertaining to the selection of instructional materials to implement the requirements of N.J.S.A. 18A:35-4.35.

Diversity and Inclusion (N.J.S.A. 18A:35-4.36a) A board of education shall incorporate instruction on diversity and inclusion in an appropriate place in the curriculum of students in grades kindergarten through 12 as part of the district's implementation of the New Jersey Student Learning Standards.

Asian American and Pacific Islanders (AAPI) P.L.2021, c.410 Ensures that the contributions, history, and heritage of Asian Americans and Pacific Islanders (AAPI) are included in the New Jersey Student Learning Standards (NJSLs) for Social Studies in kindergarten through Grade 12 (P.L.2021, c.416)

For additional information, see

NJ Amistad Curriculum: <https://www.nj.gov/education/amistad/about/>

Diversity and Inclusion: <https://www.nj.gov/education/standards/dei/index.shtml>

- (Sample Activities/ Lessons): <https://www.nj.gov/education/standards/dei/samples/index.shtml>

Asian American and Pacific Islanders:

- [Asian American and Pacific Islander Heritage and History in the U.S.](#)

A Teacher's Guide from EDSITEment offering a collection of lessons and resources for K-12 social studies, literature and arts classrooms that center around the experiences, achievements and perspectives of Asian Americans and Pacific Islanders across U.S. history.

Transfer Goal: Students will be able to independently use their learning to create a finished project portfolio that displays competencies and accomplishments of their project proposal.

As aligned with LRHSD Long Term Learning Goal(s): <https://www.lrhdsd.org/Page/6163>

- communicate and collaborate using appropriate technical terms to describe, analyze, interpret, and judge their work and the work of others

Enduring Understandings

Students will understand that. . .

EU 1

- Documentation and presentation is the final stage of the design process and pulls together all of the stages of the entire design process and clearly communicates them to a wide audience in a variety of formats.

Essential Questions

- *How can tests be designed to measure the success of a technological product or system?*
- *What is the value of effective documentation?*
- *How can we validate the data that is collected during the testing phase?*

- All of the stages of the entire design process are needed in order to communicate clearly to a wide audience in a variety of formats.
- During evaluation, both the product/system and the process of design (design and management decisions made by the student designer throughout the process) can be evaluated in the following terms: Aesthetics, Ergonomics, Performance, Durability, Cost, and Impacts.

Knowledge

Students will know . . .

EU 1

- various methods of testing to demonstrate effectiveness of design
- data recording methods of testing and interpreting the recorded data
- effective presentation skills for demonstrating their completed project to a panel for a critical design review

Skills

Students will be able to . . .

EU 1

- test and validate results of their original problem statement
- document and record results in a spreadsheet and present their findings by interpreting the gathered data and analyzing it
- present their final project to a panel

Stage Two - Assessment

Stage Three - Instruction

Learning Plan: Suggested Learning Activities to Include Differentiated Instruction and Interdisciplinary Connections: Each learning activity listed must be accompanied by a learning goal of **A= Acquiring basic knowledge and skills, M= Making meaning and/or a T= Transfer.** {place A, M and/or T along with the applicable EU number in parentheses after each statement} All knowledge and skills must be addressed in this section with a corresponding lesson/activity which teaches each concept. The following color codes are used to notate activities that correspond with interdisciplinary connections and 21st Century Life & Career Connections (which involves Technology Literacy): **Red = Interdisciplinary Connection; Purple = 21st Century Life & Career Connection**

- Create and publish a project portfolio with progress and technical documentation including problem statements, constraints, technical drawings, assembly details, and final results of completed project. **(M,T EU1)**
- Establish a valid method to test the completed project for several criterion. **(M, EU1)**
- Record and interpret data to present finding from the testing process **(M, EU1)**
- Final presentation for a critical design review **(T, EU1)**
- Public speaking and presentation skill **(A, M, T, EU1)**

Pacing Guide

{This chart will be identical in all of the units for this course.}

Unit #	Title of Unit	Approximate # of teaching days
1	Project Management	24
2	Project Preparation	30
3	Implementation of Project Proposal	70
4	Reflection and Presentation	11

Instructional Materials

- *Instructional materials would be dependent upon the independent projects proposed by the student(s).*
- *Assorted structural metals are needed on-hand along with metalworking equipment and supplies.*
- *Welding, processing equipment, and laptops/desktops capable of running computer-aided-manufacturing software (such as SolidWorks, OnShape, Autodesk Fusion/Inventor) is required.*
- *A subscription to machinist reading materials, such as Modern Machine Shop, magazine should be purchased and available for students to generate relevant ideas.*
- *Software and display means for student presentation.*

Accommodations

Special Education: The curriculum will be modified as per the Individualized Education Plan (IEP). Students will be accommodated based on specific accommodations listed in the IEP.

Students with 504 Plans: Students will be accommodated based on specific accommodations listed in the 504 Plan.

English Language Learners: Students will be accommodated based on individual need and in consultation with the ELL teacher.

Students at Risk of School Failure: Students will be accommodated based on individual need and provided various structural supports through their school.

Gifted and Talented Students: Students will be challenged to enhance their knowledge and skills through acceleration and additional independent research on the subject matter.