

Course: *Capstone in Metalworking*
Unit #: *1 - Project Management*

Year of Implementation: 2024-2025

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Stage One - Desired Results

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

{provide all applicable links to standards here}

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

- **Unit Standards:** *(keep each of the following headings in place)*
 - **21st Century Life & Career Standards**
 - 9.3.MN-PRO.5 Demonstrate the safe use of manufacturing equipment.
 - 9.3.MN-LOG.3 - Develop a safety inspection process to assure a healthy and safe manufacturing facility
 - 9.3.MN-MIR.2 - Demonstrate the safe use of manufacturing equipment to ensure a safe and healthy environment.
 - 9.3.MN-QA.4 Employ project management processes using data and tools to deliver quality, value-added products.
 - 9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas
 - 9.4.12.TL.4: Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem
<https://www.state.nj.us/education/cccs/2020/2020%20NJSLs-CLKS.pdf>
 - **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*
 - Grade 9-10 Companion Standards:
https://www.nj.gov/education/standards/ela/Docs/2016NJSLs-ELA_Companion9-10.pdf
 - Grade 11-12 Companion Standards:

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

- **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 complete a project proposal that will stem from their prior course knowledge to advance their skills sets into an independent study/project. REVISED

As aligned with LRHSD Long Term Learning Goal(s):<https://www.lrhsd.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. . .

Essential Questions

<ul style="list-style-type: none"> • <i>the project proposal reflects knowledge and interest gained in the previous coursework .</i> • <i>specifications dictate boundaries or limitations as well as criteria that any potential solution must contain in order to create the project.</i> 	<ul style="list-style-type: none"> • <i>What makes a project successful?</i> • <i>What needs to be considered in having a project proposal passed?</i>
<p><u>Knowledge</u> Students will know . . .</p> <p><i>EU 1</i></p> <ul style="list-style-type: none"> • <i>A project proposal consists of functionality, usability, manufacturing, required resources, potential outcomes/consequences, costs, trade- offs, benefits, impacts on layers of society, and ethics. (9.3.MN-QA.4)</i> 	<p><u>Skills</u> Students will be able to . . .</p> <p><i>EU 1</i></p> <ul style="list-style-type: none"> • Present the background and overall goals of their proposed project (9.3.MN-QA.4) • Estimate the resources, budget and time needed to complete specific tasks for the scope of work (9.4.12.TL.4) • Research a project and be able to use reliable sources to guide them in their project proposal (9.4.12.TL.4)
<p>Stage Two - Assessment</p>	
<ul style="list-style-type: none"> • 	
<p>Stage Three - Instruction</p>	

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**

- **Student Biographical Sketch (A, EU1)**
- **Demonstrate machine and tool safety (A, EU1)**
- **Research materials and designing principles (A, EU1)**
- **Create a capstone project proposal with a potential outcome (M/T, EU1)**
- **Justify the use of the machines and tools to implement the project proposal (M, EU1)**
- **Formulate teams, timelines and contact experts/consultants (M, EU1)**
- **Create a budget sheet including material costs (T, EU1)**
- **Proof of concept sketches (T, EU1)**
- **Identify the impacts on society (T, EU1)**
- **Identify ethical uses of materials and recycling/repurposing (T, EU1)**
- **Project proposal demonstration (T, EU1)**
- **Preliminary design review (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.