



SCHOOL DISTRICT OF MONROE

Preparing for the Future, One Child at a Time

Introduction to Engineering Design

Course Description:

The curriculum for this course is a high school honors level specialization course in the national **Project Lead the Way (PLTW) Engineering Program**, and is developed in alignment with the [Wisconsin Standards for Technology and Engineering](#). This elective course is a 2-trimester course in which students will apply the engineering design process to identify, formulate, and solve engineering problems. Utilizing the activity-project-problem-based (APB) teaching and learning pedagogy, students will demonstrate an ability to design a system, component, or process to meet desired needs within real-life constraints, such as: economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability. The information in this course overview outlines what students should understand and be able to do by the end of the trimester.

Mastery Standards:

Students will analyze and use tools and materials used in the manufacturing industry. (BB1.b)

Students will apply measurement systems in analyzing quality design, engineering, and construction. (AC1.a, AC1.b)

Students will analyze and apply engineering design theory design theory, including the role of troubleshooting, research and development, invention and innovation and experimentation in problem solving. (ENG1.a, ENG2.a, ENG2.b, ENG3.a, ENG3.b)

Students will develop abilities to apply the design process, including executing and receiving evaluations and feedback on projects, which is vital to learning and improving skills. (ENG4.a, ENG4.c, ENG5.a)

Students will be able to select and use manufacturing technologies for specific tasks, and create and communicate alternative solutions. (MNF1.a, MNF1.b)

Unit	Description of Unit and Learning Targets
<p>Unit Title: 1</p> <p><u>Essential Questions:</u></p> <ul style="list-style-type: none">When solving an engineering problem, how can we be reasonably sure that we have created the BEST solution possible and defend our solution with evidence?	<p>Students will...</p> <p><u>Learning Targets:</u></p> <ul style="list-style-type: none">I can explain and demonstrate how engineers solve problems using a specific engineering design process.I can explain and demonstrate my skills in technical representation and documentation of my design solutions.
<p>Unit Title: 2</p> <p><u>Essential Questions:</u></p> <ul style="list-style-type: none">What is the most effective way to generate and communicate potential solutions to a problem?	<p>Students will...</p> <p><u>Learning Targets:</u></p> <ul style="list-style-type: none">I can identify and demonstrate my skills in measurement and statistical analysis, to mathematically represent information and data that will be used and applied to the design process.I can identify and demonstrate my skills in using current 2D and 3D computer design and modeling, to represent and communicate design solutions in a professional manner.