

## Course Syllabus

Gateway: Principles of Applied Engineering

Grade Level: 7 & 8 | High School Credits: 1

## Course Overview

This course introduces students to foundational engineering concepts through hands-on design, modeling, automation, and robotics projects. Students will learn teamwork, problem-solving, and technical skills using industry-standard tools and software.

## Year at a Glance

Time Frame	Unit Focus	Key Content Topics
First Six Weeks	Introduction to Design	Safety, design process, sketching, measurement, decision matrices, prototype testing, statistical analysis
Second Six Weeks	Solid Modeling	CAD software, solid and hollow models, surface area/volume, prototype design and testing
Third Six Weeks	Design Challenge	Team projects applying design process, research on engineering careers and history
Fourth Six Weeks	Automating Mechanisms	Robotics history, gear systems, programming motors, system assembly, troubleshooting, algorithms
Fifth Six Weeks	Sensors and Systems	Sensor integration, algorithms with conditionals and loops, autonomous system building, system planning
Sixth Six Weeks	Create and Automate	Final design projects, collaboration, career exploration, solution evaluation

## Learning Objectives

- Understand and apply safety in engineering environments
- Use sketches and CAD tools for design and modeling
- Apply the engineering design process to create functional prototypes
- Develop skills in automation and robotics programming
- Collaborate effectively in teams
- Explore engineering careers and opportunities

## Resources

- PLTW Curriculum Documents (Introduction to Design, Solid Modeling, Design Challenge, Automation and Robotics)
- Autodesk Inventor/TinkerCAD
- Vexcode V5 for VEX Robotics
- Supplementary online videos showcasing mechanical and robotic systems

## Grading Policy

<b>Grade Weights</b>	<ul style="list-style-type: none"><li>• 100% - Assignments &amp; Projects (Projects are chunked into multiple “formative” assignment grades)</li></ul>
<b>What can be retaken?</b>	<ul style="list-style-type: none"><li>• All assignments</li><li>• Missed components of projects must be completed during tutorials</li></ul>
<b>When are tutorials?</b>	<ul style="list-style-type: none"><li>• Tuesday, 4:25 - 5:25 pm</li><li>• Thursday, 4:25 - 5:25 pm</li></ul>
<b>How long do students have to retake items above?</b>	<ul style="list-style-type: none"><li>• 5 school days</li></ul>
<b>What is the maximum score on a retake/redo?</b>	<ul style="list-style-type: none"><li>• 100% for submitted assignments</li><li>• 90% for projects/assessments</li></ul>
<b>What has to be done to be eligible for a</b>	<ul style="list-style-type: none"><li>• Assignments can be completed and turned in within 5 school days of posting in TAC</li><li>• Projects/Assessments must be completed</li></ul>

<b>retake?</b>	during tutorials
<b>What does a retake look like?</b>	<ul style="list-style-type: none"> <li>• Assignments: complete and contact teacher in writing it has been completed</li> <li>• Assessments: Corrections with explanation for new response</li> <li>• Projects: Communicate with teacher</li> </ul>
<b>Is there a cap on how many times something can be redone/retaken?</b>	<ul style="list-style-type: none"> <li>• Once</li> </ul>
<b>Late Work Policy</b>	<ul style="list-style-type: none"> <li>• 5 school days</li> </ul>
<b>Is there any penalty to late work?</b>	<ul style="list-style-type: none"> <li>• Up to 80%</li> </ul>
<b>Grade Codes</b>	<ul style="list-style-type: none"> <li>• 'M' in the online grade book indicates the assignment has not been completed and turned in to the teacher.</li> <li>• 'Blank' indicates the assignment has been turned in and is in the process of being graded by the teacher.</li> <li>• 'X' indicates the assignment will be exempted from the student's average and will not count against them.</li> <li>• '0' indicates the assignment scored a zero due to incorrect work, incomplete work, or work not turned in within the allotted time.</li> </ul>

## Standards Alignment

Standards covered include TEKS codes: 4F, 4G, 4H, 5A-D, 6A-E, 9A-D, 10A-H, 11A-I, 2B-G, 3A-F, 7A-C, 8A-D

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