

Principles of Engineering (POE)

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Course Description:

Principles of Engineering (POE) is a high school level survey course of engineering. The goal of POE is to develop skills and understanding of course concepts through activity-, project-, and problem-based (APPB) learning and prepare them for post-secondary engineering course study. To be successful in POE, students should be concurrently enrolled in college preparatory mathematics and science. Students will employ engineering and scientific concepts in the solution of engineering design problems. Students will develop problem-solving skills and apply their knowledge of research and design to create solutions to various challenges. Students will also learn how to document their work and communicate their solutions to their peers and members of the professional community.

Program:

Project Lead the Way - Pathway to Engineering (PLTW-PTE)

Course Outline:

% of Final Exam

Unit 1 Energy and Power (24 Days)	
Lesson 1.1 Mechanisms (VEX Platform)	6%
Lesson 1.2 Energy Sources	8%
Lesson 1.3 Energy Applications	9%
Lesson 1.4 Design Problem	9%
Unit 2 Materials and Structures (20 Days)	
Lesson 2.1 Statics	15%
Lesson 2.2 Material Properties	8%
Lesson 2.3 Material Testing	9%
Lesson 2.4 Design Problem	
Unit 3 Control Systems (23 Days)	
Lesson 3.1 Machine Control (VEX)	9%
Lesson 3.2 Fluid Power	11%
Lesson 3.3 Design Problem	
Unit 4 Statistics and Ballistics (15 Days)	
Lesson 4.1 Statistics	10%
Lesson 4.2 Kinematics	6%

Essential Questions: What are some strategies that can be used to make everyday mechanisms more efficient?

Fees:

A lab fee of \$26 is required for this class for students not participating in the free and reduced lunch program. The fee is \$16 for reduced lunch participants.

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Course Projects

VEX Robotics complex machine design
VEX Robotics marble sorter machine design

Grading:

80% of final grade
 40% - Activities & Projects
 15% - Engineering Notebook
 35% - Major Tests
 10% - Participation
20% - Final Exam, PLTW Standardized Test

Engineering Notebook:

All notes, vocabulary, sketches, activities, and projects will be documented in your Notebook. Students may use their notebook for vocabulary and major tests, excluding the EOC Exam.

Career and Technical Student Organization (CTSO):

TSA – All students are encouraged to become members of Technology Student Association. Local, State and National dues are \$20/yr.

Industry Credentials:

No certifications are available for POE curriculum. However, each PC is loaded with Autodesk Inventor (3D modeling), which offers the student an opportunity to obtain an industry recognized certification. Free license are also available for home computers.

Learning Management System (LMS):

Students and parents will be provided individual online accounts to access all course assignments, activities, grades, portfolio, syllabus, and presentations

Expectations:

Students are expected to develop soft skills essential to successful careers:

1. Effective Communication (participation)
2. Teamwork
3. Time Management (meet deadlines and no tardies)
4. Ethics
5. Safety
6. Proper PC Usage

As of 2015-16:

1. Students who do not make up their work or make arrangements with their teacher within three days will receive a zero.

2. There are no longer exam exemptions. All students are required to take a comprehensive exam for all classes.