

Project Lead the Way: Principles of Engineering

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Welcome!!!

You will find that Principles of Engineering is not only a fun course but also a lot less intimidating than many have perceived it. True, the subject can be very challenging and heavily rooted in math and science but I am committed to working with you so that you can succeed.

Materials/Supplies Needed:

- Class Engineering Notebook
- Your mypltw.org username and password (No textbook is required; curriculum is online)
- Your school email/google account

Class/Lab Policy:

Every day you will be working on or around expensive computing and trade equipment. This requires a zero food/beverage policy. Also, any dereliction of duty or unsafe behavior in shop will result in a reduction of participation grade and/or loss of lab privileges. *Excessive missing assignments and/or failing grades will result in losing the opportunity to participate in future PLTW courses.

Course Description:

This survey course exposes students to some of the major concepts that they will encounter in a postsecondary engineering course of study. Through problems that engage and challenge, students explore a broad range of engineering topics, including mechanisms, the strength of materials and structures, automation, and kinematics. The course applies and concurrently develops secondary level knowledge and skills in mathematics, science, and technology.

Course Objective:

Students have the opportunity to develop skills and understanding of course concepts through activity, project, and problem-based (APB) learning. By solving rigorous and relevant design problems using engineering and science concepts within a collaborative learning environment, APB challenges students to continually hone their interpersonal skills, creative abilities, and problem solving skills.

Course Outline/Year at a Glance:

1st Semester

- Energy and Power: Mechanisms
 Energy Sources
 Energy Applications
 Design Problem
- Control Systems: Machine Control (VEX Robotics)
 Fluid Power
 Design Problem

2nd Semester

- Materials and Structures: Statics
 Material Testing
 Material Properties
 Design Problem
- Statistics and Kinematics: Statistics
 Kinematics
 Design Problem

Grading Scale:

Range	Grade
100 – 93 %	A
92 – 90 %	A-
89 – 87 %	B+
86 – 83 %	B
82 – 80 %	B-
79 – 77 %	C+
76 – 73 %	C
72 – 70 %	C-

69 – 67 %	D+
66 – 63 %	D
63 – 60 %	D-
Below 60 %	F

Performance	10%
Activities/Notebook	60%
Assessments/Presentations	30%

Come to class every day and be on time

Work not finished in class is HOMEWORK!

Grades are updated every day. You can always check your grade online.

By earning a C or higher in POE (both semesters) you may enroll in AP Physics the following school year.

College Credit through Cerritos College with B or higher

Competency and Skill Expectations (when students finish this class they should be able to):

- Describe the common job tasks, work environments, necessary education, salaries and benefits of a given field of engineering through research and interview of a professional engineer
- Determine how to proceed through possible alternate routes of a design process
- Modify a design to improve the efficiency of a system (electrical, mechanical, robotics)
- Work as a team member in a diverse environment to equitably delegate responsibility in a design project (identify the problem, plan, and allocate resources)
- Demonstrate ability to solve various engineering problems and utilize formula sheets to make calculations (mechanics, thermodynamics, fluids, electrical, control systems/robotics, statics, statistics)
- Apply sketching techniques and create computer aided design drawings
- Demonstrate proper use of engineering hardware and software (scales, calipers, micrometers, multi-meter, breadboards and components, digital thermometers, Autodesk Inventor, MD Solids, RobotC, Vex Robotics Kits)
- Acquire, analyze, and interpret data to effectively communicate results in writing and through verbal presentations (Powerpoint, Google Slides, Prezi)
- Design, assemble, and program autonomous robots capable of performing an instructor assigned task