Intro to Engineering Design (IED) Syllabus

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Course Description:
Introduction to Engineering Design (IED) is a high school level course that is appropriate for students who are interested in design and engineering. The major focus of the IED course is to expose students to a design process, research and analysis, teamwork, communication methods, global and human impacts, engineering standards, and technical documentation. IED gives students the opportunity to develop skills and course concepts through activity, project, and problem-based (APPB) learning. Used in combination with a teaming approach, APPB-learning challenges students to continually hone their interpersonal skills, creative abilities and understanding of the design process. It also allows students to develop strategies to enable and direct their own learning, which is the ultimate goal of education.
The course assumes no previous knowledge, but students should ideally be concurrently enrolled in college preparatory mathematics and science, although this is not a prerequisite. This course is a High school level course that incorporates college level engineering content. That being said, all students are encouraged to take the course regardless of their ability level or comfort level. Students will employ engineering and scientific concepts in the solution of engineering design problems. In addition, students use a modern issued 3D solid modeling design software package (Autodesk Inventor Pro) to help them design solutions to solve proposed problems. Students will develop problem-solving skills and apply their knowledge of research and design to create solutions to various challenges that increase in difficulty throughout the course. Students will also learn how to document their work, create a presentable portfolio, and communicate their solutions to their peers and members of the professional community.
Introduction to Engineering Design is one of three foundation courses in the Project Lead The Way high school pre-engineering program. The course applies and concurrently develops secondary level knowledge and skills in science, technology, engineering and mathematics (STEM). Lastly, this is a much more complex and intense version of PLTW because of the requirements that PLTW mandates for its prestigious high school courses.

What will my classes be like?
Ever wondered how to design something new or draw out an idea to show your friends? Using Autodesk Inventor, the industry-leading 3D design software, you can not only create a 3D image, but you can print 3D print the physical object you created! Discover the role of an engineer in taking an idea from the design process to manufacturing or production. Produce an incredible, working prototype of your project with our 3D printer. You will work on projects, activities, and problems not only of interest to you, but that have global and human implications. Work in teams to design and improve products, document your solutions, and communicate them to others.

Technology Requirements: Students are required to have access to a computer at home. Students must also have internet access at home and each student will need to create a new google account just for this course.

Course Goals / Objectives:
The Project Lead the Way curriculum includes several engineering courses including Introduction to Engineering Design, and focuses on making math and science relevant for students. By engaging in hands-on, meaningful projects, students understand how the material covered in class can be applied in their everyday lives. Learning activities will include teacher-led instruction, cooperative learning, and

project-based learning. Technology will be used to enhance students learning, and provide real-world applications that are extremely desirable in a competitive global job market.

Software at Home:

Students are encouraged to investigate and use Autodesk Inventor 2014 at home. Student downloads are free, however, the process is immensely complex and requires hours of download / install time and an attentive and knowledgeable computer user to successfully download to a powerful PC (does not run on tablets or Mac). Consequently, students will not be asked to use the software at home for homework. However, homework will be assigned regularly to supplement the content being learned each Learning Period. **Attendance is imperative** for project / course completion. Missed classes may result in a grade deduction unless excused prior to class time (only extreme or extenuating circumstances may be exempt).

Grades:

Students will be graded based on any number of the following categories. Because of the nature of our school and this course, these categories are not weighted. A point system will be implemented to account for the following categories based on the discretion of the teacher and the time invested for each category. No category will account for more than 50% of a student's grade for any given Learning Period.

- In-class Projects
- Activities/Challenges
- Academic Participation
- Academic Communication
- In Class Assignments and Homework
- Engineering Notebook / Portfolio
- Formative and Normative Assessments

Print Student's Full Name

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I have read and understand the course expectations and how to reach Mr. White.

Student Signature_____Date_____

Parent Signature_____Date_____

Intro to Engineering and Design: First week assignment

1. Students will go to https://www.pltw.org/pltw-engineering and will read the page and watch the short video.
2. Students will click on the Engineering-Curriculum link and read the entire content.
3. Students will then write 1-2 paragraphs on a sheet of paper explaining what they learned about the PLTW engineering program and curriculum.
4. Students will research on the web the engineering profession (use reliable sources).
5. After finishing their research, students will write 2-3 paragraphs on a sheet of paper explaining what they learned about engineers and engineering.
6. All work will be turned in to the teacher on the first day of onsite classes.