

# PLTW - Introduction to Engineering & Design

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**Instructor: Mr. Mark Welker**

**Office Hours: Thursday: 2:40 - 4:00, All Additional By Appointment**

## **Course Description:**

Introduction to Engineering Design (IED) is a high school level course that is appropriate for 9th or 10th grade students who are interested in design and engineering or another technical career. The major focus of the IED course is to expose students to a design process, professional communication and collaboration methods, design ethics, and technical documentation. IED gives students the opportunity to develop skills in research and analysis, teamwork, technical writing, engineering graphics, and problem solving 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 and creative abilities while applying math, science, and technology knowledge learned in other courses to solve engineering design problems and communicate their solutions. IED also allows students to develop strategies to enable and direct their own learning, an ultimate goal of education.

Introduction to Engineering Design is one of the 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 mathematics, science, and technology.

## **Course Outline:**

### **Quarter 1:**

Unit 1: Design Process

Unit 2: Technical Sketching and Drawing

Unit 3: Measurement and Statistics

### **Quarter 2:**

Unit 4: Modeling Skills

Unit 5: Geometry of Design

Unit 6: Reverse Engineering

Unit 7: Documentation

Unit 8: Advanced Computer Modeling

Unit 9: Reverse Engineering

## **Communication Methods:**

| Course Website  | Remind 101            | Email  |
|---|-----------------------|--|
| <a href="http://welkersclass.weebly.com">http://welkersclass.weebly.com</a> | text @iedf17 to 81010 | <a href="mailto:mwelker@wcpss.net">mwelker@wcpss.net</a> |

## **Professional Skills:**

Time Management - Students need to apply themselves on a daily basis.

Personal Motivation - Actively seeking and taking part in any undertaking relating to the chosen skill area.

Problem-Solving Ability - This course encourages and teaches students to problem solve and use critical thinking to solve problems.

Reliability/Dependability - Demonstration by the student that he/she can be relied upon to do what is expected in class and in group work.

Ability to Work with Others - A variety of skills including teamwork are addressed. In this course students must work in groups on various tasks and projects for solving problems, generating ideas, stimulating critical thinking, etc. by unrestrained spontaneous participation in discussion. Students will acquire strong teamwork and communication skills throughout this course.

## **Cell Phone and Electronic Device Policy:**

Cell phones and other electronic devices such as tablets can be of great use in the classroom setting. Students will be allowed to use such devices during designated times. Our classroom policy includes indications for student electronic device usage as follows: Red light (no devices), Yellow Light (ask permission to use your device), Green Light (Get your Devices Out and keep them visible on your desk). When devices need to be down, the instructor will request "Park your device", meaning devices should be face down on the corner of the desk.

When devices are not to be used and a student refuses to put the device away, the following procedures will occur:

Request device be put away.

Request device to sit on instructor desk for the remainder of the period.

Contact Parent & Student Referral

**Grading:**

| Quarter 1 (40%)             | Quarter 2 (40%)                 |     | Grading Scale                |
|-----------------------------|---------------------------------|-----|------------------------------|
| Engineering Notebook        | 25% Engineering Notebook        | 25% | A: 90 - 100                  |
| Unit Exams                  | 20% Unit Exams                  | 20% | B: 80 - 89                   |
| Projects / Online Portfolio | 35% Projects / Online Portfolio | 35% | C: 70 - 79                   |
| Quizzes                     | 10% Quizzes                     | 10% | D: 60 - 69                   |
| Midterm                     | 10% IED Final Project           | 10% | Below 60, Needs Resubmission |
|                             | <b>FINAL EXAM (20%)</b>         |     |                              |

**Absences**

Attendance is taken daily. If you are absent it is YOUR responsibility to make up any work missed. I will have an absentee folder, which will have copies of all assignments in it. Absences of 3 days or less the student will have 1 day for each day of an absence to make up work missed. Absences of more than 3 days the student will have 2 days for each day absent. Assignments (including tests) made prior to a student's absence that are due during the absence or on the day of return need to be submitted to the teacher immediately upon the student's return to school.

**Tardies**

It is expected that students arrive to class on time every day. If a student is late coming into class, they will be required to sign the tardy sheet upon entering and are expected to join the class quietly.

1st Offense – Verbal Warning

2nd Offense-Verbal Warning

3rd Offense- Phone call & lunch detention assigned

**Retake & Make Up Policies:**

Missing Work Due to Absence: must be turned in within 2 days of their return to receive full credit

Late Assignments: 8pts per day for assignments turned in late. Missing assignments will be accepted up to one week after interims are distributed.

Quiz & Exam Retakes:

Write down each of the questions that were incorrect.

Use the classroom resources to find and write down the correct answers in their notebook.

Have parent sign the corrections

Schedule retake with teacher (this will be during acceleration or after school –see office hours)

**Course Materials:**

1/4" Graph Paper Notebook

2GB+ Flashdrive

Pen & Pencil

Headphones

**Donated Supplies:** Any/All supplies that you may wish to donate are welcome. Most commonly used/needed supplies include, but are not limited to, the following: Masking tape, Rubber Bands, Cardstock, String, Pencils, Pens, Hot Glue Guns, Scissors, Tissue, Hand Sanatiser, Paper Towels, etc.

**Please Complete and Return**

I have read and understand fully the information laid out in the syllabus document for my course. I will take all opportunities granted to me in order to complete my best work throughout the semester.

Student Name (Print Clearly)

Student Signature

Date

Parent / Guardian Name (Print Cl

Parent / Guardian Signature

Date