

ENGINEERING 1 an intro to engineering design at Tesla STEM HS

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Welcome to Engineering 1! Engineering 1 is the first year of Engineer Your World, a high school project-based engineering curriculum developed by the Cockrell School of Engineering at University of Texas at Austin in collaboration with the National Science Foundation and NASA. Through socially relevant explorations and design challenges you will 1) learn engineering design skills, 2) develop engineering habits of mind, and 3) explore engineering fields and professions.

COURSE OUTLINE

1. Introduction to Engineering
2. Discovering Design - Pinhole Camera
3. Reverse Engineering - Flashlight
4. Understanding Data - Coffee
5. Designing with Data - Safer Buildings
6. Programming - Electronic Music
7. Systems Engineering - Aerial Imaging

MY APPROACH

All of our classroom activities revolve around designing and building the projects listed above. My role as teacher in this course is to guide you through the design process by training you in powerful collaborative design tools and by helping you evaluate your designs so that you can redesign and improve them as we progress through each unit.

I tend to give frequent, small assignments, rather than large, long-term ones. This gives both of us regular feedback on your progress as you develop an understanding of key engineering concepts. Furthermore, if you miss one or two assignments, they won't sink your boat grade-wise. I design systems of instruction that have lots of forgiveness and second (third, fourth, etc.) chances to learn built in!

ATTENDANCE

This class is team-project based. You need to be here and be on time. You need to contribute. If you know you'll be absent, plan ahead with your teammates and me. If you are absent, check in with your team the next day to see what you missed.

You can check Skyward at any time to see if you are missing work in my class. You are responsible for scheduling make-up design and build activities or any assessments that you miss. You have the same number of days to make work up as the number of days you were absent. With the exception of excused absences, the

deadline for late assignments is within two weeks of the due date. Late work without an excused absence can receive a maximum grade of "B-" (80%). You are welcome to complete missing assignments or work on your projects during office hours.

HELPING VS. COPYING

During this school year, some of the best help you will get in engineering will come from your classmates. I applaud the cooperative spirit in which you help each other be successful in my class. You provide an invaluable service to each other!

But you must never copy a classmate's work. When I give you an individual assignment (i.e. anytime you write something original in your notebook or hand in a paper with just your name on it) then it must be your own original work. If a classmate does provide you with insights and explanations on homework and projects, you must still write all your own responses.

If you ever turn in a paper that is identical or nearly identical to a classmate's on open-ended assignments, you and the person with the identical work will both get zeros on the assignment. If someone ever copies your work without your permission, let me know immediately so the appropriate discipline can take place.

EXTRA HELP

Office hours are held in room 215.

M-F 6:35-7:25am

I work part time, so I am not available in the afternoon.

COMMUNICATION

E-mail me at mkong@lwsd.org. Please contact me anytime at with questions or to schedule an appointment. I will respond within 48 hours. All grade inquiries must be handled in person during office hours.

FEEDBACK AND GRADES

You will get feedback and grades on two main categories of work, worth approximately 50% each:

- Group** - Most group assignments are products, projects, or presentations (either written or oral). Each product that you build will be evaluated based on a rubric that we develop collaboratively to reflect what you learned during the process. Because these projects are created over the course of a unit, with ample time for feedback and revision along the way, the grade you receive on these projects is FINAL.
- Individual** - Most individual assignments are engineering notebook entries. We make entries just about every day, including notes, reflections, ideas, sketches, models, and data tables. Notebooks are working documents and don't need to be perfect, but they must be legible and provide documentation of your design process. Your entries are worth 10 points each and graded according to the following rubric:

M - Missing	I - Incomplete / Incorrect	P - Partially Complete / Correct	E - Essentially Complete & Correct	EE - Exceeding Expectations
You did not turn in this assignment.	You may have turned in an incomplete assignment or have a major misconception.	You may be missing an important component of a notebook entry or have a small misconception.	You turned in essentially complete and correct work with no misconceptions.	You went above and beyond in the quality of your work. This varies and is personal from student to student.
1 out of 10	4 out of 10	7 out of 10	10 out of 10	10.75 out of 10

In addition to the above rubric, there are two signifiers:

S - Sloppy	You might be missing a title, a date, minor labels, etc. C'mon, just check your work before you submit!	- 0.5 pts
L - Late	Your first submission of this assignment was turned in past the original due date. You can not revise and resubmit this assignment based on feedback.	- 2 pts

You will receive personalized or whole class feedback on almost every assignment you submit. **As long as turn in your initial assignment on time, you are welcome to revise and resubmit your work based on feedback for up to two weeks after the due date.** If you make improvements, your base score will increase (e.g. from an I/4 to an E/10), but you will keep the "Sloppy" signifier if your work was sloppy the first time (e.g. from an IS/3.5 to an ES/9.5).

All of the points are converted into a percentage grade (earned points / available points * 100), which is converted into a letter grade based on Tesla STEM High School's standard grading scale. There is no rounding of grades.

A Note to Parents

The best way to support your student in Engineering 1 is to make sure they are keeping up with their engineering notebook. From the gradebook in Skyward, you'll be able to get a general sense of student work completion and quality. For example, a grade of 8 means that your student turned in essentially complete work (10) but was late (-2).

Watch out for trends! Lots of 9.5s in a row means consistently complete (10) but sloppy (- 0.5) work. 4s mean that the student should come into office hours for extra support. 1s are for missing work, which will be input into the gradebook within 3 school days of the due date. And, if your student has a 0, that's serious - that means there was an incident of academic dishonesty.

Remember: Students are allowed to revise notebook entries as long as they submit assignments on time!