Engineering Syllabus

2017

# Instructor Information

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| Instructor | Email | Office Location & Hours |
| **Toni Willis** | twillis@lopez.k12.wa.us | Room Pack time or before school on Mondays  Where: science office next to science lab Or after school on Thursday |

# General Information

## Description

Students explore the fundamental principles of the Engineering design process which characterize the properties of matter and how it reacts. Students will be introduced to the engineering design process, applying math, science, and engineering standards to identify and design solutions to a variety of real problems. Students will spend the first month learning the engineering design process through collaborative projects.

In the following months, students will use computer aided design to solve a biomedical problem then use 3-D Printers to print their solutions. Teams will rotate between 3-d printer projects and VEX robotics. Robotics projects involve designing and building robot prototypes and then programming their robots to solve simple problems.

Lastly, we will delve in to the biomechanics of flight and students will design their own airfoil and collaboratively finish the wings on a kit airplane by building the frame of the foil then designing a composite skin for the wing

**Class Schedule**

Monday and Thursday from 1:50- 2:55

Tuesday-8:35 –9:30

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# Course Materials

## Required Materials

* Lab notebook
* Calculator
* Pencil
* Thumb drive

# General Course outline and tenative scheudle

**February-** **March and April**

Introduction to the engineering design process Mechanical engineering

History of gears Constraints and specifications lessons

Wind up toy dissection Mouse trap car

Creating your own windup toy or clock Vex Robotic instructor

Dissecting ear buds 3d printing

Creating your own earbuds Robotics introduction

Making your own chair out of cardboard designing your own robots

Redesigning the chair for maximum comfort Programming robots

**April and May** **May and June**

Aeronautical engineering Student plans for personal engineering project

Basic biomechanics of flight research and design

Bernoulli’s principle prototype and testing

Design our own airfoil for kit airplanes

UW engineering days building full-scale model

Museum of flight

## 

**How we are going to run the class**- First of all, I want you to know I am always here to help you with any questions you have. Just email or call anytime and I can set up time to talk with you or email you back. Second, I am super excited to problem solve and design answers to simple everyday mechanical and environmental problems.

**Philosophy for success….**

I spend a good deal of time building relationships with my students. First of all I have a charter we create together as a class. Think of it like the Constitution of the United States, it might later on need amendments.

For instance there is freedom of speech during times when lectures are **not** in progress.

I ask you to practice listening to others including myself then pause 15 seconds before you answer in any situation… Be thoughtful and respectful as I plan to do onto you. PLEASE RAISE Your HAND…. My hearing is not so great so I may not hear you or I may not be able to identify who is speaking…

When you have a comment raise your hand…Finally, we share this room with others please only touch your supplies. SIMPLE ….

ALWAYS have a Pencil….

ALWAYS be on time…

**Grading policy**

25 percent for lab notebook due every Friday- see rubric for notebook expectations

25 percent for class participation- see rubric

50 percent graded projects see rubric for grading

W**ork is considered late if you do not turn it in on the day I have it due on Skyward**

You have one week to make up missed work

Work turned in after one week absent or forgotten is a 0 in the grade book

If life is bringing you way down give me a signal take a moment a turn it around for a little while until we can speak about what is bothering you. Life is not always about Engineering but we do have a good deal to cover. I promise you I will make this course relevant interesting, and worth your full attention.