Draft Physics Syllabus: Honors Physics
Mr. Kuncik
Old Rochester Regional High School
2019 – 2020 school year

Vision:
The goal of honors physics is to give students the primary skills necessary to succeed in college math and science courses. About 40 % of American high school students indicate interest in studying math and science in college, but only about half of them graduate with a math or science diploma. I believe we can greatly improve students' chances by giving them the skills most likely to help them pass college math and science courses. These include:
- analytical reasoning, being able to defend results contrary to human intuition
- strong basic math skills
- following directions to operate laboratory devices
- setting up and conducting open-ended explorations in the laboratory
- writing effectively and precisely about science
- basic computer programming skills

The goal of honors physics is to practice and develop these skills over the course of the year.

If you are not planning to study math and science in college, you are certainly still encouraged to take honors physics if you want to by challenged. Know that you will still be held to the same standard of expectation as a student who is planning to major in medicine or engineering.

Grading:
Grading will be on a total point scale. Each assignment is worth a certain number of points, and your grade is determined by the total number of points you earned divided by the total number available. Roughly, points are worth as follows:
- typical classwork assignment: 5 – 15 points
- typical homework assignment: 5 – 15 points
- quiz sequence (after three attempts): 80 – 100 points
- lab report: 30 – 50 points
- writing assignment: 30 – 50 points
- programming assignment: 20 – 40 points

I conduct my tests differently from normal. It is difficult to explain the method, but after a few weeks it will make sense! Instead of taking a test once, students typically take a test on a particular topic 3 – 4 times. Your grade is based on the difficulty of the hardest problem you are able to solve. Roughly:

Hardest Problem You can solve	Your Grade
The hardest problem you can solve is one that has only one step.	D
The hardest problem you can solve has 2 -3 steps.	C
The hardest problem you can solve has more than 3 steps and/or requires you to consider different sources of information	B
The hardest problem you can solve is one that involves many steps, incorporating content from different areas, non-direct or counterintuitive methods.	A

Note that the problems required to receive an A are just under the level of difficulty you could expect from many college physics courses. The goal is to reach the point where you can expect to be successful in college course if you take it.

Again, I'm not going to try to explain my entire system here, but it will make sense after a few weeks in class.

Programming:
Computer programming problems are a significant component of this course. I do not assume that you have any previous experience with computer programming. Most students don't! We will learn the basics of programming, but specifically while using it to help solve physics problems.

Most modern physicists and engineers spend a significant amount of time programming. When I did research in college, most of my research was based on programming! The problems that modern physicists and engineers have are too complex to be solved by a pen and paper, and require the assistance of a computer, which can go complete millions of operations in a second. The purpose of this course is to prepare students for college STEM classes, and because college STEM students need to program, we will program in this class.

Homework:
Homework will be based on practicing methods reviewed in class and doing some reading related to physics. New concepts will not be introduced via homework. Homework will be collected in a folder with your name on it in the classroom.

Textbook:
There is no official textbook for this course, but many online resources will be made available.
The most useful of these resources is a website called The Physics Classroom.
https://www.physicsclassroom.com

If you want to get a head start over the summer, look at some of the information on this website under Current Electricity, 1-D Kinematics, and Newton's Laws.

Website:
I use my own website for the course, rather than Google Classroom.
My website can be accessed through
mrkuncik.com
or
danielkuncik.com

The site is currently still set up for this year, I will be updating the site before the start of the year.

Room:
My room next year is not the same as my room this year!
It will be the room that was previously Ms. Faria's and Ms. Bonnie's room.
So on the first or second day of school, go there!