Welcome to the Advanced Physics Lab. You are a senior who has taken or is currently taking Calculus AB. If you are in Calc AB, will you be at a disadvantage compared to those folks who are in BC? Not necessarily, but you will have to work a bit harder to stay on top of the math. I am assuming that you have taken the yearlong Honors Physics course at Tesla STEM. The big question is: How much physics do you remember from 3 years ago? Not much? Don’t worry, it might come back to you. The challenge will be to develop problem solving ability and track details while still reserving part of our brains to ponder big, cosmic, mind expanding questions. Fortunately, we have the luxury of time with two physics periods which means we will meet four days a week.

I. Advanced Physics C: Mechanics and Electromagnetism: First and foremost our mission is to deepen your understanding of physics. All our physics content this year can be expressed as a few equations. You won’t need to memorize much but you will need to develop advanced problem-solving skills. Physics is a cumulative subject and doesn’t lend itself to short term cramming. This class requires thinking and becomes more abstract as we progress. In the fall semester we will focus primarily on Mechanics: motion, force, momentum, energy, rotation and Newtonian gravity. In the spring semester we will take up Electromagnetism including circuits and Maxwell’s Equations. That said, we will integrate some E&M into Fall, and revisit Mechanics in the Spring.

II. In the Lab: We need to be able to put all this developing physics understanding to good use. Some of the labs will be fundamental physics work like measuring the acceleration due to gravity, the speed of sound, or figuring out the charge-to-mass ratio for the electron. You will get lots of hands-on time with a variety of equipment. Want to learn how to use an oscilloscope? You have come to the right place. Want to know what the heck an oscilloscope is? You are really in the right place. Lab work will include projects. I want to give you time to tinker in the lab. Projects allow you to express your creative side while learning new skills.

III. Logistics and tips for success: You will need to check the Calendar page on Teams daily under the section Information for Families daily for assignments and resources. The website saxbyphysics.com is your backup in case of Teams problems.

A. What you will need every day for our Teams meetings:
1. Calculator: problem solving is not a spectator sport. Get the same one you need for math: TI-80?
2. Whiteboard with markers which I gave you in the Starter Kit.
3. Colored pens (gel markers work best) for notes and diagrams.
4. Correction tape: we all make mistakes!
5. Protractor and ruler. Get a simple, large (at least 4.5” across) clear, one-piece protractor like this:

B. **Discussion/Lecture:** Be an active participant in class discussions. Speak up if you don’t “get it,” or if you think your teacher is wrong (a rare but satisfying occurrence.) **Be compassionate** with other students who are experiencing difficulty. You could be next!

C. **Note-taking:** You don’t need to write down everything but you do need to keep your PJ up to date.

D. **Daily Schedule:** Teams meetings every day except Wednesday.

E. **Daily Homework:** In addition to the custom homework on the website, homework problems will be taken from *Fundamentals of Physics*, 10th Ed by Halliday, Resnick and Walker. This text has some of the best homework problems available in print. See [Homework](#). You will turn in a weekly homework packet.

F. **Tests:** Not sure how these are going to work this year. As far as I know there is no secure way to give tests online. If we can find one, we could try it.

G. **Grading:** Your overall grade is simply based on points, according to the standard 10-point scale. Your grade for this distance learning term will be based on HW, your PJ, and projects. Your transcript will show both AP Physics C: Mechanics, and AP Physics C: Electromagnetism for both semesters. **The semester grade for both courses is the same because they are integrated.** This is a good thing if you are doing well, and a hazard if you are not, so stay on top of things.

H. **Integrity:** For labs your own work is the best work for you. Even if your own “bad” data is better for you than someone else’s “good” data.

I. **Extra help:** Stay tuned for office hours and Physics Workshop. Just because physics is a hard science doesn’t mean it can’t be a social science too.

J. **Web based resources:** Course materials will be available online on the Calendar page on Teams. If you can’t get through on Teams use the calendar on saxbyphysics.com. Check the calendar daily to find out what we did each day and to get homework assignments. You will need access to a printer to print the many custom assignments. If you have printer issues you can hand-copy assignments. The best way to contact me electronically is through email: psaxby@lwsd.org.

K. **Late work:** Late work doesn’t work. The course is fast paced and every day counts. If you miss turning in an assignment you need to get back up to speed immediately. HW solutions are often posted the next day, making late HW obsolete.

IV. **The AP Physics C Mechanics and E&M exam:** This course is organized around the expectation that you will take the standardized AP Physics C Mechanics and E&M test in May allowing you the possibility to get college credit, and the chance to see how you stack up in an international setting.

V. **In conclusion:** welcome! **This course is challenging and a fair amount of work,** but I hope it will be one of the high points of your senior year. Let’s get to it!

Sincerely,

Mr. Peter Saxby