MIHS Curriculum Night, AP Physics 2

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Course Information:  
Students in AP Physics 2 will be preparing for the Advanced Placement Physics 2 exam. The course content is set by The College Board and covers Fluids, Thermodynamics, Electricity and Magnetism, Optics, and Atomic and Nuclear (Quantum) Physics at an introductory, college level. Many of these topics were touched on Physics 1 and Physics 2, but some will be new.

The College Board recommends concurrent enrollment in Pre-calculus; we will make extensive use of Algebra and Trigonometry.

Text:  

Course Website:  
After logging in to Schoology and navigating to the course website, you will see the ‘materials’ page. ‘Materials’ shows a list of folders containing resources for each unit thus far. The unit folder contains problem set solutions, lab instructions, and an ‘agendas’ page, providing highlights from each day of class.

Student Evaluation:  
Grades in this course are only partly an indication of subject mastery. True mastery of this content may require studying physics many times at different levels and from different perspectives. Rather than mastery, a high grade in this course indicates readiness to continue studying physics at the next level. As a result, even though most of the grade will reflect physics knowledge, grades in my class also include some factors related to study skills, including credit for merely completing problem sets and penalties for late assignments. Students with low grades should not conclude that they are unable to study physics; rather, they are not ready at this time to continue on in physics, but students can become ready by, for example, improving study habits and math skills.

The AP exam for this course is relatively new, and the scores awarded have been unusually low for an AP Physics exam. Only about half as many students earned 4’s and 5’s as for the AP Physics C: Mechanics exam nationally. I would like to say that students who earn an A will probably score a 4 or 5 on the exam, but with AP Physics 2, many students earning A’s might score lower. Though some colleges offer credit for a score of 3, many, including the University of Washington, only offer credit for this exam for scores of 4 or 5. An additional option for college credits is that offered through Bellevue College, for Physics 115; the cost is $240 and details will be provided in March.
The grades themselves are calculated from various types of assessments: tests (55%), labs (25%), and problem sets (20%).

The lab activities are important both as an opportunity to practice applying concepts and to put them in an actual (hands-on) physical context. Lab reports make up 25% of the final grade, based on the percentage of time that the College Board suggests we devote to lab investigations. I may need to postpone some lab activities in order to introduce enough concepts before the AP test in May; if so, they will be completed after the AP exam. I will not require “formal” lab reports; most will include a clear data table, detailed calculations, and results with an emphasis on experimental uncertainty and clearly written reasoning.

The problem sets are critical to the course because we build our understanding of physics concepts by exploring how they are applied in unfamiliar and revealing scenarios. These assignments make up 20% of the final grade, a high enough percentage to emphasize their fundamental importance to the course but low enough to recognize that these are opportunities for practice. I assume one is in the process of learning the material while doing the problem sets, so correct answers are not required for full credit. However, one must show written evidence of having attempted each problem assigned; an “attempt” is at least one step beyond merely writing or drawing the given information. I will not have time to grade all problem sets, but working on these problems is an essential step in learning the physics of this course, so I will not reveal whether an assignment will be graded until it is due.

The tests make up the remaining 55% of the course grade. One’s performance on the unit tests will most clearly indicate one’s final level of understanding as well as one’s ability to demonstrate that understanding in an AP-exam-like context. Because students each learn at different rates, some students will need more than is available under the schedule required by the College Board, so I will offer a retake test for each unit – without penalty (only the highest score will be kept), which will be given approximately one week after the first version of the unit test is returned. Additional retakes are not likely to be available, both because of limitations on my time to write them and because we will need to devote our time and attention to later units.

I offer curves, or bonus points, added equally to everyone’s score on tests, and these curves can result in a test score of over 100%. I will set the amount of the bonus based on the performance of the current and previous students on this and similar tests (to gauge the difficulty of the test), as well as on the curve applied by the College Board to the AP exam results. The curves will allow one to leverage high achievement in one unit (and a resulting score of over 100%) to make up for lower scores in other units; one can use one’s strengths to make up for weaknesses in other areas.

Late assignments will be penalized by an amount depending on the type of assignment and on how late they are. Most late assignments will be worth a maximum of 70% of their original value, in recognition that engaging in the learning process is important whenever it occurs. However, the educational value of any assignment is diminished when it is completed outside the intended context. Assignments turned in after important results are released, such as other classmates’ graded assignments, may have their scores lowered further; for example, late lab reports cannot earn a higher score than the lowest score awarded to an on-time paper. This policy is designed to remove the incentive in increase one’s scores by turning work in late.
Late tests, tests taken after an unexcused absence or beyond the grace period following an excused absence, will be offered, because a score of zero would not offer any indication of one’s knowledge. However, late test scores may not receive the standard curve, because such tests might offer an unfair advantage.

**Skyward:**

I will send periodic notes via Skyward; please update your email address on the Skyward system in order to receive them.

Skyward will list any assignment without a grade as ‘missing’ after the due date, but I may not have finished grading the assignment. I will mark actual missing work with a score of zero; these are the assignments that are truly missing.

**Extra Help and Tutoring:**

I am available for extra help by appointment, but students are free to look for me during the 15 minutes before and after school; I will accommodate ‘walk-in’ questions whenever I can.

We are fortunate to have MIHS Physics Teachers available for free physics tutoring; Brian Hampsch tutors for physics on Friday mornings from 6:50 to 7:50.

**Bellevue College:** Students taking this course have the option to receive 6 quarter credits of Physics 115 at Bellevue College, for an enrollment cost of $240. I will provide details about this program in late winter.

**Physics Next Year?** For students who are not graduating this year, we have a second AP physics class, AP Physics C: Mechanics, which is a calculus-based curriculum covering motion, forces, momentum, energy, rotation, torque, oscillation, and gravity. Calculus is a course requirement, but concurrent enrollment in calculus is acceptable. Students who have completed both Calculus and AP Physics 2 may enroll in both AP Physics C: Mechanics and an independent study course in Electricity and Magnetism with calculus. This independent course is designed to prepare students for yet another AP exam, AP Physics C: Electricity and Magnetism. (However, this independent study course is not an official “AP” class, because it is not audited and approved by the College Board.)

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