

Course Syllabus AP Physics-B Mr Dilsaver Room H243, B5

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Text – *Fundamentals of College Physics*, Peter J. Nolan, 1993

Welcome to AP Physics! This policy statement contains information about the conduct of our class. This paper discusses the pace and content of the class, as well as how student progress is assessed. It is recommended that you retain this paper for reference.

Materials – students need to bring their textbook to class each day. A scientific calculator is needed. Students will receive many handouts. A student can easily fill a medium size loose-leaf notebook with handouts, notes and assignments in EACH of 5 major areas we will cover (Mechanics, E/M, Thermo, Waves & Optics, and Modern Physics). Students are strongly encouraged to plan to take the AP Physics national exam in May.

What is the AP program? – The AP (Advanced Placement) program is designed to allow high school students to take college level classes while in high school, and to do this on the high school campus. Students can choose to take a national exam near the end of the school year. Scores on this test range from 1 – 5 (1 is low, 5 is high). Many colleges and universities will award credit and/or advanced placement to students scoring 3 or higher on this exam. The exact score required and the exact amount of credit received varies. Students are strongly encouraged to check AP acceptance policies at their potential schools of choice. The exam score and college credit is the immediate payoff from the AP class. This instructor hopes that better basic understanding of physics, and more well developed problem solving skills are the real payoff. In this class the successful student will learn a lot of physics, and increase their skill at problem solving.

Attendance. The official OHS attendance and tardy policies will be followed. Students are strongly encouraged NOT to miss class. Having said that, AP students are also often in track, band, choir, cross-country, debate, tennis, football, chess, drama, math club . . . etc. All these activities are important and you are encouraged to participate. Class will continue in your absence. Assignments are posted on the assignment boards in Rm H243; be resourceful. When you miss class, get notes from someone, work even harder outside of class. You'll learn that we do a LOT each time we meet. Consider that we cover all or part of 29 chapters from our college level text. We do this in a class that meets every other day, for a total of about 88 times. Even with no time out for tests, labs, or quizzes; we'd have less than 3 meetings per chapter. The pace at which we cover material is faster than most high school classes and is good preparation for college.

Participation. Students are strongly encouraged to actively participate in class. Some of the questions in each assignment are listed as "OHP" (overhead projector) problems. Students will present their solutions to these selected problems on the overhead projector. Each student is responsible for several (usually 5 or more) OHP problems during each grading quarter. A major part of the process of solving a problem is clearly communicating the solution method to the reader (the teacher, or other students). Students will frequently have the opportunity to solve problems at the board. It is common to have a **WEEKLY QUIZ**. Also, occasionally (when needed?!) scores are curved by the $\sqrt{\quad}$ method.

Level of effort required – some semesters we have had evening study sessions, frequently students form study groups to attack the problems, every semester students take a "final" – a practice AP exam, whether they are exempt from finals or not, some years we have done Saturday morning study sessions a few weeks before the AP testing. So, more is expected in a class which is AP, and which also by the way, is weighted.

Physics Review Sheets and weekly quizzes – an attempt will be made to give a weekly physics review sheet, as well as an "end-of-the-week" quiz at the conclusion of each week.

No Work, No Credit, No Kidding! – generally, students must show work on problems in order to receive credit. Most of our problems are sophisticated enough that even a talented student can't "just look at the problem" and see the answer. *The explanation of the method involved is crucial!*

Exams and grading – Students will receive points for each assignment, quiz, lab report, or test. My goal is to have each be about the following % of our points: Tests – 25%, Lab work 25 %, text problem assignments 25%, quizzes - 25%. I do not use the "weighting" feature of the computer gradebook. All points in AP Physics are the same "size". I try to accomplish the above distribution by number of assignments and number of possible points. The grading scale is as follows: > 90% = A, 80 – 89% = B, 70 – 79% = C, 55 – 69% = D. <54% = F. For students who are extremely grade conscious, or tremendously concerned about class rank, it is suggested that they use one of their pass/fail options for this class. This allows the student to focus on the classwork and be less panicked about their current grade.

Labs and Lab safety. Lab work is an important component of this class. Time is limited, however. Often, our lab work is short, part of a block, possibly based on a demonstration or short procedure to illustrate some physics principle, with a short informal write up. But, at least once per major unit we have a more involved lab with a formal write up. Clearly communicating lab results is an important skill, worthy of our attention. Students are to pay especially close attention to lab safety instructions. Students are required to know the location of and function of the safety equipment we have in lab.

Honesty and integrity: Honesty and integrity are vital in science. It is essential, for example, to report one's actual results in lab, and not try to "fudge" or "cook" the "data" by reasoning out what the result "should have been"! Even Newton himself missed results by making this mistake! If we are to learn how nature works by the method of observation and experiment then we must learn to observe accurately and report honestly. One should never claim another's work as one's own. If the student accurately reports his or her own results and diligently makes sure to credit the work of others, they will always be on a secure footing.

How to get help. The short answer to the question "how to get help" is "ask!" I expect students to have lots of questions in this class! I need feedback from you about what you understand. Also, even the best students will find that in order to do well in this class, some (perhaps much!) out of class work will be required. I make a special effort to be available after school on Mondays and Thursdays. Please take advantage of this. Also, use our advisory period (even though it is short) to come in for help. The discussion process, the interchange of ideas, is tremendously important in learning physics (or any subject). Class allows time for these discussions, but often a problem that seems easy when the teacher does it in class may seem more challenging when you try it on your own, and the discussion that occurs afterwards is fruitful.

Course description, objectives. AP Physics B is a survey of all of physics. The math level required is trigonometry. We will learn about the following areas: Motion (35%), Electricity and Magnetism (25%), Thermodynamics and Fluids (15%), Wave Phenomena (10%), Modern Physics (10%). The percentages quoted are the percent of the AP test which is based on that particular area. This gives an approximate idea of the amount of time we'll spend discussing each area. Here is a list of chapters in our textbook, and the topics included, organized in much the order in which we'll talk about them in class:

Mechanics

Ch/topic

2 – Vectors

3 – Kinematics

4 –Newton's Laws

5 –Torque/Equilibrium

6 – Circular motion

7 –Energy/conservation

8 –Momentum/conservation

9 –Rotational motion

Thermo/Fluids

Ch/Topic

10 –Elasticity

13 –Fluids

14 –Temp/heat

15 –Gas Laws

16 –Heat Transfer

17 -Thermodynamics

Wave Phenomena

Modern

Ch/Topic

31. Quantum Physics

32. Atom (Electron energy)

33. Atom (nucleus)

34. Particles

Electricity/Magnetism

Ch/Topic

18 –Electrostatics

19 –Electric Field

20 –DC circuits

21 –Capacitance

22 –Magnetism

23 –Induction

Ch/Topic

11. SHM

12. Wave Motion

26. Reflection

27. Refraction

28. Physical Optics