**ADVANCED PLACEMENT PHYSICS B 2012-2013 MR. GROFF**

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**INTRODUCTION**

Welcome to AP Physics! I am pleased that you have selected to take this class for the upcoming school year. This class covers many different topics as they are related to the science and engineering fields. This class will help you to focus your problem solving skills and help you understand the world around you.

This course is likened to “intro college physics” and will be focused as such. We will cover many topics in relative short periods of time, staying on top of things is a must. I can say that if you are a high school student going on to college in any science field you will have to take similar physics classes in college as a requirement, so lets use this class as batting practice so that when you move on to college you knock it out of the park.

My main goals for this class are simple. Improve your problem solving, analytical, and experimental skills as well as preparing you for the AP Physics Exam. Much of my assessment material (tests, quizzes etc…) will have components from the AP test within them. Doing this throughout the year will help us practice while completing units outlined later in this syllabus.

**TEXT:** ***Physics: Principles with Applications* Giancoli, (6th Edition), 2005.**

**COURSE OUTLINE**

**FIRST SEMESTER**

UNIT 1

 Review, Measure, Graph, Analyze : Review measurement, converting, dimensional analysis, while graphing data for graphing analysis.

UNIT 2

Kinematics: 1 dimensional kinematics with constant acceleration and projectile motion.

UNIT 3

 Force: Systems and Free Body Diagrams, Newton’s Laws, Friction, Drag, and Torque, Uniform Circular Motion.

UNIT 4

 Energy: Conservation of Energy, Work/Power, Oscillations.

UNIT 5

 Momentum: Impulse, Conservation of Momentum, Collisions (elastic/inelastic).

UNIT 6

 Fluids: Pressure, Buoyancy, Pascal’s Principle, Bernoulli’s Principle.

 **SECOND SEMESTER**

UNIT 7

 Electrostatics: Charge, Field, Potential, Columb’s Law, capacitors, conductors.

UNIT 8

Current and Electricity: Conductors, Current, Resistance, Power, Ohms Law, Circuits.

UNIT 9

 Magnetism: Magnetic Fields, Faraday’s Law

UNIT 10

 Thermodynamics: Energy Transfer, Gas Laws

UNIT 11

Mechanical Waves/Sound: Pulses, Standing Waves on a string, reflection, refraction, interference, Doppler effect.

UNIT 12

 Physical Optics: Wave Model of Light, Interference, diffraction.

UNIT 13

Geometric optics: Refraction, Snell’s Law, Reflection, Plane/Curved Mirrors, Lenses, Ray Diagrams.

UNIT 14

Atomic/Nuclear Physics: Photoelectric Effect, Nuclear reactions.

**GRADING AND POLICIES**

**Homework**

This is a broad category as homework can come in many shapes and forms, from practice problems, reading assignments, lab write-up’s etc. My homework will be a critical part of your understanding of the class. If you keep up with your homework then you keep up with that class, I believe this very much. I encourage working together to assist each other in solving the problems but this doesn’t mean giving each other answers! It is important you know how to solve the problems yourself.

**Class Participation**

I am big on work ethic. When you come to my class I expect you to come in with the attitude “lets get things accomplished!”. We only have 46 min!, so making sure we get down to business is important. You can do this by always being prepared with necessary daily class materials, and by having a positive attitude and an interest in what we are learning. You were not forced into this class; you wanted to take it, so enjoy yourselves!

**Labs**

All labs require students to turn in their own written work. You will achieve this by keeping your own lab notebook for data collection, analysis, and lab reports. It is very important to keep a very neat lab note book, this will help immensely when it comes to writing formal lab reports. We will complete at least 12 inquiry-based labs throughout the year as established by The College Board. If you do not complete your lab in class, it is up to you to do so in your free time, such as a study hall or even lunch.

**Tests**

This is the largest single chunk of your grade so they are very important. Each unit will be followed by a formal test. Normally modeling the format of the AP test. This consists of a multiple choice section followed by problem based, multi step calculation questions. Please feel free to see me with any questions you have regarding tests. It is critical to not miss school on tests days if at all possible.

**Projects**

Projects are always going to be graded based on a rubric of my choosing. This will be outlined on the date you receive the project. I will also take group peer evaluations with group based projects as an attempt to insure fairness of workload and to assist in the grading process.

**Flexibility**

I know that you students have very busy lives, with extracurricular activities, school clubs and just general family things. I am flexible with certain assignments but please do not make this a habit. If it is an emergency I will allow extra time but do not mistake this for a get out of jail free card.

**Classroom Expectations/Activities**

I will do my best not to lecture too much. I want this instead to be student centered class will a lot of discussions, group work and collaboration as a group in order to solve and understand the concepts discussed in class.

 I expect you to:

* + Be prepared and on time
	+ Use class time wisely
	+ Always be respectful of each other as if they were a professional colleague of yours.
	+ Be responsible for your own learning
	+ Always come in to class with a positive outlook, ready to learn.

**REQUIRED MATERIALS- Daily**

* Binder with organized sections by unit in order to keep all important materials (homework, quizzes, tests) in chronological order.
* Graphing calculator
* Pencil-I hate pens when doing physics work, you will have to erase!
* Separate lab notebook portfolio, organized in chronological order.
* Notebook for class notes and homework.

**LABS BY UNIT**

UNIT 1

 Velocity and Acceleration

UNIT 2

 Kinematics: Ruler/Sphere constant acceleration.

UNIT 3

 Force: Modified Atwood’s / Friction Blocks

UNIT 4

 Energy/Work/Power

UNIT 5

 Momentum-PHET Simulations

UNIT 6

 Fluids: Is the crown gold.

UNIT 7

 Electrostatics: Leyden Jar/ Van De Graff

UNIT 8

 Currents/Circuits:

 BUILD CIRCUITS

UNIT 11

 Standing Waves and Oscillations

UNIT 12

 Single Slit Interference

**Student Information Sheet**

**NAME:**

What skills do you feel are your strongest in relation to this class?

What are you planning on doing in 5-10 years?

Anything else I should know about you?

**SIGN OFF**

 I have read and understand the above syllabus and will do my best to meet all expectations. I will always strive to work hard and have a positive attitude while in class. I realize that success in this class is up to me first and foremost.

**Student Signature: Date:**

**Student e-mail: Parent Phone:**

**Parent Signature**

**Parent e-mail:**

**GRADING SCALE AND BREAKDOWN**

