AP Physics 1

Course Expectations and Syllabus

**Mrs. Robin Loner, G101**

***Course Overview:***

AP Physics 1 is college level course intended to replace one semester of algebra based College Physics after the achievement of a score of 3 or better on the AP Physics 1 test. for the serious student who is curious about the workings of the world and is very comfortable with mathematics. If you are enrolled in this class, you should not have stopped your math with Algebra 2, so you should be enrolled in Pre-Calculus or Calculus. While Physics uses lots of math, it is not simply a math class. You will receive experience with the concepts used in algebra, geometry, and pre-calculus (trigonometry) that may help you realize just why math really is meaningful- it helps us explain the workings of the universe!!

TEXTBOOK

Etkina, Eugenia, Michael Gentile, and Alan Van Heuvelen. *College Physics*. San Francisco, CA: Pearson, 2014.

INSTRUCTIONAL STRATEGIES

The AP Physics 1 course is conducted using inquiry-based instructional strategies that focus on experimentation to develop students’ conceptual understanding of physics principles. The students begin studying a topic by making observations and discovering patterns of natural phenomena. The next steps involve developing, testing, and applying models. Throughout the course, the students construct and use multiple representations of physical processes, solve multi-step problems, design investigations, and reflect on knowledge construction through self-assessment rubrics.

In most labs, the students use probeware technology in data acquisition. In the classroom, they use graphing calculators and digital devices for interactive simulations, Physlet-based exercises, collaborative activities, and formative assessments.



***Student Expectations/Rules:***

1. There is absolutely **no eating or drinking in my classroom**. You are allowed to have a bottle of water only. Tervis Cups and Yeti or other types of personal lidded cups will be taken up and returned to the student through the front office.
2. Put your **PHONE AWAY** in your backpack or purse. Please see High School Phone Policy for consequences.
3. **Follow directions** the first time they are given.
4. Be in your seat **with all supplies** when the tardy bell rings.
5. Remain seated and attentive until the **teacher** dismisses the class.
6. Students will be respectful and courteous. Inappropriate language and insubordination will not be tolerated.
7. Respect the personal space of others. Keep hands, feet, and other objects to yourself.

***Classroom Materials:***

******Students will need to bring the following items to class **every day** in order to be prepared for class:

* + A willingness to succeed and a questioning mind
  + Composition Notebook or 100 page Spiral Notebook. (this is for notetaking during lab and classroom lecture)
  + #2 pencil for all assessments. **NO ASSESSMENT WILL BE ACCEPTED OR GRADED THAT IS WRITTEN IN PEN!**
  + A scientific or graphing calculator is strongly recommended. Calculators, however, will be provided for each student during class time, but these calculators may not leave the classroom.

***Grades:***

The grades will be calculated by using the percentage you have earned of the total points available for each nine-weeks grading period. Tests will be worth significantly more points than homework or daily grades.

1. **Daily work** - Homework and daily class assignments represent **10%** of the nine week grade.
2. **Quizzes** – Quizzes may be **announced** or **unannounced** (Pop Quiz) and may cover any of the material covered in class. Quizzes represent **30%** of the nine week grade.
3. **Tests** - Tests are announced at least one week in advance and will be composed of multiple choice and free answer questions. Exams will represent **60%** of the final nine weeks grade for the course. There will three major assessments/exams per nine week period.
4. **Notebook** – A Digital Interactive Notebook grade will be taken each nine weeks based upon the student’s use of OneNote. The digital notebook will consist of notes and all work done each nine week including lab reports. The training and format will be covered in class. This grade will be equivalent to Quiz grade of **30%**.
5. **Lab activities/experiments** – Some activities may require some additional outside work. Students may be expected to report on their findings, draw conclusions, and determine mathematical relationships. Labs represent **30%** of the nine week grade.

**YOU MUST MAINTAIN A 75 TO REMAIN IN AP PHYSICS 1**

***Lab and Safety****:*

As with any science class, a portion of your grade will be derived from lab work. You will spend approximately 40% of your time doing hands on activities and experiments. Lab will account for 30% of your grade and full participation in group work is expected.

**ABSOLUTELY NO HORSEPLAY WILL BE TOLERATED**!

Anyone using unsafe lab practices will be excused from the lab and a **zero** will be assigned in the gradebook followed by a phone call home and possible office referral. SAFETY FIRST!

 ***Late work and all the Excuses:***

Homework and other assignments are due at the **beginning** of class. Late work will be accepted up to 3 days late for a 75. After 3 days the grade will become a “0” in the gradebook.

***Make-up Policy:***

EACH STUDENT IS RESPONSIBLE ON THE DAY THEY RETURN TO FIND OUT ABOUT ANY MISSED WORK. The request for missing work should be done before class or after class. Once the tardy bell has sounded, class has begun and all requests for work will be postponed.

STUDENTS WILL BE GIVEN THE SAME AMOUNT OF TIME THAT THEY WERE ABSENT IN ORDER TO COMPLETE MISSED ASSIGNMENTS. Ex: If a student misses 2 days of school they are allowed 2 days to make up any missing work.

* **Work assigned prior to a student’s absence is due upon their return.**
* **Tests and Quizzes missed while absent can only be made up during tutorial times, advisory or after school. You must arrange with me when you would like to schedule your missed test.**
* Students absent the **class day before** a quiz or test **will** take that quiz or test on the scheduled day – tests will be announced at least **one week** in advance; most quizzes will be announced at least **one to two days in advance.**
* This policy applies only to **EXCUSED** absences. Under no circumstances will this apply to truancy in which case the student could receive a zero for missed work and/or exams.

***Test Corrections and Retakes:***

One retest is allowed per nine weeks period for no more than a 70 and will consist of a different test of the same difficulty. Corrections may be made to any test the student made below a 70 and will provide up to 10 points for recapture up to a new grade of a 70.

***Cheating:***

Cheating of any form will not be tolerated. Examples of **cheating** include:

* + - ******copying from another student homework or assignments (ie. labs)
    - allowing another student to copy homework or assignments
    - **plagiarizing** (copying from the internet)
    - using cheat notes
    - talking during an exam or quiz

Any offense in cheating (even just one question) will result in a **zero** for that particular assignment or exam followed by an Office Referral and a phone call home.

In the end, it is you that gets hurt if you cheat. The homework is designed to give you practice solving questions similar to those on the test. Short term gain by turning in a homework assignment that has been copied impacts your long term goals of passing this class….

***Restroom Passes:***

You may obtain the hall pass only if you **surrender your cell phone**. Abuse of the Restroom Policy will by asking to go daily will result in a phone call home and placement on the No Fly List.

TUTORIAL TIMES

AFTER SCHOOL: MONDAY – THURSDAY 2:35 to 3:20

TUTORIALS ALSO AVAILABLE DURING ADVISORY TRAVEL DAYS

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COURSE SYLLABUS

UNIT 1. KINEMATICS Big Idea 3

Kinematics in one-dimension: constant velocity and uniform accelerated motion

1. Vectors: vector components and resultant
2. Kinematics in two-dimensions: projectile motion

UNIT 2. DYNAMICS **Big Ideas 1, 2, 3, 4**

Forces, types, and representation (FBD)

1. Newton’s First Law
2. Newton’s Third Law
3. Newton’s Second Law
4. Applications of Newton’s Second Law
5. Friction
6. Interacting objects: ropes and pulleys

**UNIT 3. CIRCULAR MOTION AND GRAVITATION Big Ideas 1, 2, 3, 4**

Uniform circular motion

1. Dynamics of uniform circular motion
2. Universal Law of Gravitation

**UNIT 4. ENERGY Big Ideas 3, 4, 5**

Work

1. Power
2. Kinetic energy
3. Potential energy: gravitational and elastic
4. Conservation of energy

**UNIT 5. MOMENTUM Big Ideas 3, 4, 5**

Impulse

1. Momentum
2. Conservation of momentum
3. Elastic and inelastic collisions

**UNIT 6. SIMPLE HARMONIC MOTION Big Ideas 3, 5**

Linear restoring forces and simple harmonic motion

1. Simple harmonic motion graphs
2. Simple pendulum
3. Mass-spring systems

**UNIT 7. ROTATIONAL MOTION Big Ideas 3, 4, 5**

Torque

1. Center of mass
2. Rotational kinematics
3. Rotational dynamics and rotational inertia
4. Rotational energy
5. Angular momentum
6. Conservation of angular momentum

**UNIT 8. MECHANICAL WAVES Big Idea 6**

Traveling waves

1. Wave characteristics
2. Sound
3. Superposition
4. Standing waves on a string
5. Standing sound waves

**UNIT 9. ELECTROSTATICS Big Ideas 1, 3, 5**

Electric charge and conservation of charge

1. Electric force: Coulomb’s Law

**UNIT 10. DC CIRCUITS Big Ideas 1, 5**

Electric resistance

1. Ohm’s Law
2. DC circuits
3. Series and parallel connections
4. Kirchhoff’s Laws