

## PHYSICS SYLLABUS

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**Course Description:** Throughout the course emphasis will be placed on problem solving and skills on laboratory work.

To provide sufficient instruction so that students continue studying physics at college level. To understand and clarify the basic concept in Physics.

**Text:** PHYSICS, Holt.

**Grading:** Students will be graded on quizzes, exams, homework, and projects/lab. Home work will carry 10-15 points each time. To get a full credit 50% and above answers must be correct. Tests each will carry 100 points. Distribution of points will be mentioned on the test. Labs/projects carry 25-30 points

**Content:** The main topics we plan to cover include:

### **UNITS COVERED IN THIS COURSE**

**1<sup>st</sup> nine weeks:** We will start with some very important concepts in order to be successful in this course.

- Basic math Skills review: Students will review conversions, significant figures, scientific notations.
- Motion in one dimension: Investigate and evaluate the graphical and mathematical relationship of one-dimensional kinematic parameters with position, direction of motion, and time.
- Motion in two dimensions: Students will derive a relationship between scalar and vector, students will be taught giving examples of vectors in different directions and then show their negative vectors.
- Forces and Laws of Motion: Students will understand kinematics describing motion of an object without concept of force. Students will learn to resolve vectors into components.

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### **2nd nine weeks:**

- **Work and Energy:** Students will learn to identify and calculate different types of energy and their transformation (thermal, kinetic, potential, including magnetic and electrical potential energies) from one form to another in a system.
- **Momentum and Collision:** Students will develop and apply the impulse-momentum theorem along with scientific and engineering ideas to design, evaluate and refine a device that minimizes the force on an object during a collision (helmet, parachute)
- **Circular motion:** Students will learn about tangential speed, centripetal acceleration, and centripetal force. They will plan and investigate and provide evidence that a constant force perpendicular to an object motion is required for uniform acceleration.

### **3rd nine weeks:**

- **Heat:** Students will investigate conduction, convection, and radiation as a mechanism for the transfer of thermal energy
- **Thermodynamics:** Students will investigate and evaluate the laws of thermodynamics and use them to describe internal energy, heat and work.
- **Electric forces and fields:** Students will communicate ideas to describe how forces at a distance are explained by fields (gravitational, electric and magnetic) permeating space. Students must be able to explain how energy is contained within the field and how energy changes when objects generating and interacting with the field change their relative positions.

### **4<sup>th</sup> nine weeks:**

- **Vibrations and Waves:** Students will know wave parameters like amplitude, period and velocity as well as how these quantities are defined in cases of longitudinal and transverse waves.
- **Sound waves:** Students will learn about medium and propagation of waves.
- **Light and Reflection:** Students will learn about different types of mirrors, mirror equation, reflection of light and compare their uses in daily lives.

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Your success in this course will directly reflect on the amount of time and effort you put into it.

### Class room rules:

#### Here are some suggestions that may help you:

1. Come to class daily
2. Participate actively and ask questions in the class.
3. Keep notes about demonstrations and examples presented in the class.
4. Keep up with your work.
5. Be open to variety of learning styles and activities.
6. Cheating on tests by using phones or any other way will **STRICTLY result in a 0 grade.**
7. **Class Behavior: KEY word is RESPECT. Respect your teacher and friends!**
8. No eating, drinking, or chewing gum in the class. Before entering the class, make sure you trash your drink or spit out your gum. Only a bottle of water is allowed in the class as well as the lab.
9. Students are expected NOT **to bring any phones to their seat**, throw things, and tamper with equipment in the classroom or the lab.

### Materials:

#### Please bring the following to the class daily:

- Blue/Black pen, #2 pencil, and a ruler
- Scientific calculator/ TI 84 (Very important and bring to class daily)
- A notebook for taking note.
- Textbook
- Lab notebook (composition Notebook) when needed.

#### Homework and Make up work policy:

- If any HW is submitted after 10 days then the student will receive 50% credit (unless any proof of an emergency situation). If a HW is submitted late, then the student will receive 70% credit, provided it is not exceeding 10 days. (unless genuine emergency)
- Homework will be assigned frequently. **HOMEWORK WILL BE ASSIGNED ON CANVAS. FOR FULL CREDIT ON HW ALL RELATED MATH WORK MUST BE SHOWN.** Physics requires repetition in order to master difficult concepts and develop necessary problem-solving skills.

You will have tests **on Mon or Thursdays mostly.**

I look forward to teaching each and every one enrolled in this class.

Mahua Chakraborty

Physics Teacher

