

# Physics 12

## Course Goals:

The Science Curricula should provide opportunities for students to acquire the skills and to understand the process of science.

Skills and processes of science include knowing how to use one's senses effectively and how to manipulate science apparatus. More fundamentally, they include the ability to state problems, formulate hypotheses, design and carry out problem solving techniques.

## Course Outline:

It is expected that students will:

### A. Vector Kinematics in 2-Dimensions

- analyze the relative motion of 2 objects, linear vector introduction.
- demonstrate an ability to use vector analysis to solve problems involving  $v$ ,  $d$  and  $t$  in 2 - dimensions.
- apply concepts of motion with constant acceleration to various situations.

### B. Vector Dynamics in 2-Dimensions

- analyze forces acting on a object and predict their effects on that object.
- Use the concepts of two dimensional dynamics to analyze situations.
- identify situations involving translational, rotational, and static equilibrium and apply the concepts of force, torque and equilibrium to solve problems.

### C. Circular Motion & Gravitation

- demonstrate an ability to describe and apply the concepts of uniform circular motion to real life situations.
- horizontal and vertical circular motion,  $F_N$
- demonstrate an understanding of the nature of gravitation.
- orbital mechanics, launch and escape velocity.



## Course Evaluation:

### Distribution of Term Marks:

Course work	60%
Tests	40%

### Calculation of Final Grade

Term 1	40%
Term 2	40%
Final Exam*	20%

\* there will be a final exam for all students.

### D. Vector Momentum and Impulse.

- demonstrate an ability to apply energy transformations and the concept of power to everyday situations.
- demonstrate an ability to describe and apply the concepts of momentum and impulse to examples of explosions or impacts.
- use the concept of two dimensional momentum to analyze situations.

### E. Electric Field

- apply Coulomb's law to situations involving point charges and demonstrate an understanding of electric fields on stationary charged objects.
- calculate electric potential and apply the concept of electric potential energy and potential difference.
- relationship between force, charge and distance in a many charges system

### F. Magnetic Field

- demonstrate an understanding of the nature of magnetic fields and magnetic forces on moving charged objects.
- Magnets, wires, solenoids and right hand rules.
- Faraday's Law, Lenz' Law and magnetic induction.
- Apply the concept of magnetic induction to everyday problems.