**Honors Physics**

**Syllabus**

Unit I. Introduction to Physics

1. Nature of Physics

2. The scientific method

3. Mathematics in Physics

- Units

- Scientific notation

4. Measurement

- Uncertainties in measurement

- Significant figures

- Precision and Accuracy

5. Graphing data

Unit II. Mechanics

1. Describing motion

- Coordinate systems

- Scalars and vectors

2. Vector addition and subtraction

3. Force and Motion

- Newton’s laws of motion

- Relative motion

- Projectiles

- Circular motion

- Rotational motion

- Universal gravitation

4. Momentum and conservation

5. Energy and work

- Forms of energy

- Conservation of energy

- Simple machines

Unit III. States of matter

1. Solids

- Elasticity

- Stress and strain

- Fracture

2. Fluids

- Pascal’s principle

- Buoyancy and Archimedes’ principle

- Bernoulli’s principle

- Surface tension and capillarity

Unit IV. Waves and Light

1. Wave properties

2. Sound waves

3. Light waves

- Interaction of light and matter

4. Optics

- Reflection and Refraction

- Mirrors and lenses

- Diffraction and Interference

Unit V. Heat Energy

1. Thermal energy

2. Thermodynamics

Unit VI. Electricity

1. Static Electricity

- Electrical charge and electrical force

2. Current Electricity

- Electric current and Resistance

- Series and parallel circuits

3. Electromagnetism