**Cold Spring Harbor High School**

**AP Physics C: Mechanics**

**Course Syllabus**

Text : *Physics for Scientists and Engineers*, 9th Edition Raymond A. Serway | John W. Jewett

**Newtonian Mechanics**

**A. Kinematics** (including vectors, vector algebra, components of vectors, coordinate systems, displacement, velocity, and acceleration)

1. Motion in one dimension

2. Motion in two dimensions, including projectile motion

**B. Newton’s laws of motion**

1. Static equilibrium (first law)

2. Dynamics of a single particle (second law)

3. Systems of two or more objects (third law)

**C. Work, energy, power**

1. Work and work–energy theorem

2. Forces and potential energy

3. Conservation of energy

4. Power

**D. Systems of particles, linear momentum**

1. Center of mass

2. Impulse and momentum

3. Conservation of linear momentum, collisions

**E. Circular motion and rotation**

1. Uniform circular motion

2. Torque and rotational statics

3. Rotational kinematics and dynamics

4. Angular momentum and its conservation

**F. Oscillations and gravitation**

1. Simple harmonic motion (dynamics and energy relationships)

2. Mass on a spring

3. Pendulum and other oscillations

4. Newton’s law of gravity

5. Orbits of planets and satellites

a. Circular

b. General

***All Students are required to take the AP Physics C Exam***