

New course application:

Proposed course – AP Physics C Mechanics

Duration – full year – 1.5 credits – lab class every other day – meets at the same time as the current Lab Physics class

Is the course replacing another? – NO

Rational for need –

There are two AP Physics programs that the College Board will certify; the AP Physics B and the AP Physics C. The later is split into two exams – Mechanics and then Electricity and Magnetism. The Physics B is equivalent to the first year of college physics. The AP Physics C Mechanics is equivalent to the first semester of college physics and the AP Physics C Electricity and Magnetism is equivalent to the second semester of college physics. Each college decides which test to accept and what score(s) qualify for credit. Some colleges only accept the AP Physics B some only accept the AP Physics C. Some accept all, some accept none. This creates a need for those students who matriculate to a college or university that only accepts the AP Physics C exam.

For the past 15 years students have been earning college credit for the work done in my AP Physics B course; not all of them of course, but some each year. Adding this course would enable more students to earn college credit for the work they do in high school.

Course Curriculum or Outline –

I. 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

Cost: Supplies and text – Students will use the same text as the other Lab Physics Students but an additional review book for each student will be needed - \$25 each – no new supplies

Data Regarding scheduling students, rooms, and facilities: - This will be a hybrid course that will run simultaneously with the current Lab Physics course. So no new sections or rooms will be needed. It will be open to juniors and seniors. Students will be expected to complete all of the regular Lab Physics assignments etc. along with extra work outside of class. This extra work will be used to fill in the gaps left behind from the Lab Physics curriculum as compared to the AP Physics C curriculum.