University School
KAP Physics- 2007-2008
Instructors – Mark Carle, Gordon Loveland
Kenyon course: Physics 140 Fundamentals of Physics.
1 semester credit lecture
.5 semester credit laboratory

This course is a theoretical and experimental introduction to calculus-based mechanics. It is taught through lectures with a 3-hour weekly laboratory session. Topics covered in the course include the kinematics and dynamics of particles, gravity, work and energy, linear and angular momentum, and special relativity. Participants are expected to also enroll in calculus. It is a year course that meets daily.

The basic text is Halliday, Resnick and Walker, Fundamentals of Physics 6th Ed. An accompanying study guide is also used.

The syllabus of the course is that of Physics 140 at Kenyon, and is essentially that suggested by the College Board for a C level AP physics course in mechanics. In addition, coverage is given to one dimensional waves, special relativity, and elementary particle theory. The mathematical level of the course is the same level as the Halliday and Resnick text, using calculus whenever appropriate, thus taking advantage of the fact that the students in the course are concurrently enrolled in an introductory calculus course.

The students keep a laboratory notebook that is inspected at the end of each lab period, and they submit a formal laboratory report each semester. There are five two-hour exams during the year plus a three-hour final exam.

Experiments include:

1. Analysis of Experimental Data
2. Acceleration Due to Gravity
3. Projectile Motion
4. Centripetal Force
5. Young's Modulus
6. Air Resistance
7. The Ballistic Pendulum
8. Collisions in One Dimension
9. Collisions in Two Dimensions
10. Rotational Kinematics
11. Rotational Inertia of a Ring
12. Rotational and Gravitational Energy
13. Equilibrium
14. Rotational Collisions
15. Simple Harmonic Motion
16. Angular Simple Harmonic Motion
17. Speed of Sound in Air
18. Elastic Scattering of Particles
19. Inelastic Scattering of Particles
20. The Mass of the Electron