AP PHYSICS

CREDIT HOURS: 1.0  COURSE LENGTH: 2 Semesters

COURSE DESCRIPTION
AP Physics is a yearlong introduction to the algebra-based major areas of physics – mechanics, fluids, waves, optics, electricity, magnetism and modern physics (atomic and nuclear). Students learn to think like scientists: making predictions based on observations, writing hypothesis, designing and completing experiments, and reaching conclusions based on the analysis of data derived from these experiments. Students apply the concepts of physics to their everyday experiences and current events and issues in science and engineering. The course provides opportunities for guided inquiry and student-centered learning to foster critical thinking skills.

COURSE OBJECTIVES
Upon completion of this course, the student will be able to:

1. Read, understand, and interpret physical information
2. Demonstrate proficiency in explaining and solving algebra-based problems in the major areas of physics
3. Apply the concepts and procedures of scientific reasoning to understanding physics phenomenon
4. Perform experiments, interpret the results of observations and communicate results

COURSE PREREQUISITES
Algebra 2, Pre-Calculus, Physics and teacher recommendation. Trigonometry with one year of Physics highly recommended

REQUIRED TEXTBOOK (S) and/or MATERIALS
Graphic Calculator, AP Physics Lab Kit

Title: Principles with Applications
Publisher: Pearson Education Inc.
TOPIC OUTLINE

1. Mathematics and Science Review
2. Data Collection and Analysis
3. Motion in One Dimension
4. Motion in Two Dimensions
5. Static Equilibrium
6. Dynamic Equilibrium
7. Systems of Two or More Objects
8. Forces, Work and Work-Energy Theorem
9. Conservation of Energy
10. Power
11. Simple Harmonic Motion, Springs, and the Pendulum
12. Gravity and Orbits
13. Momentum & Impulse
14. Circular Motion & Torque
15. Density and Pressure
16. Buoyancy
17. Fluids in Motion
18. Temperature and Heat
19. Ideal Gases
20. Thermodynamics
21. Semester Exam
22. Charge and Coulomb’s Law
23. Electric Field and Electric Potential
24. Electrostatics with Conductors
25. Capacitors
26. Currents, Resistance, & Power
27. Direct Currents
28. Capacitors in Circuits
29. Magnetic Fields
30. Electromagnetic Induction
31. Traveling Waves
32. Wave Propagation
33. Standing Waves
34. Physical Optics
35. Geometric Optics
36. Mirrors
37. Lenses
38. Atomic Physics and Quantum Effects
39. Atomic Energy Levels and Wave-Particle Duality
40. Nuclear Physics
41. Preparing for the Exam
42. The Final Exam
43. Post World War II Civil Rights Legislation