**AP Physics 1&2 INSTRUCTORS: Andria Chaney, Nancy Misage, Lisa Taylor, Bob Witowski**

**COURSE DESCRIPTION:** AP Physics 1&2 is an algebra-based class which includes the study of the following broad topics: mechanics, thermodynamics, sound and light, electricity and magnetism, modern and nuclear physics. The course will prepare the student to take both AP Physics 1 and 2 exams in May and lays the foundation for future studies in calculus based physics courses.

**CONTACT INFORMATION:**

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**TUTORIALS:** Daily Before School 7:30 – 8:40 AM or by appointment.

**MATERIALS:** Students are required to bring the following daily.

1. Pencil

2. Paper

3. Scientific calculator

4. iPad

As per district policy, *students are not permitted to display, turn on, or use a personal device, during instructional class periods unless authorized by the instructor.*

**TEXTBOOK:** **Physics: Principles with Applications** by Giancoli

**GRADING SYSTEM:** Tests will determine 70% of the grade. Daily work including quizzes. labs and graded homework will determine the other 30%. All students will be provided the opportunity to correct mistakes and increase performance on major assessments.

At least three daily grades will be dropped every nine weeks.

All work must be shown to receive full or partial credit for any problem on homework, labs, tests, or quizzes.

**MAKEUP POLICY:** Late work will be accepted when a student has an excused absence. Students are responsible for all work missed. The calendar and assignments will be found on the physics website accessible through the teacher websites. (https://sites.google.com/a/eanesisd.net/whsphysics)

Students have one day to make up work for each excused day missed.

**ELIGIBILITY:**  In all cases, eligibility will follow the UIL guidelines. Consult the student handbook.

**CLASSROOM GUIDELINES:**

1. **Here on time, here to stay.**
2. **Be curious and ask questions**
3. **Listen**
4. **Be helpful**
5. **Be safe**
6. **Have fun**

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| **Nine Weeks** | **Unit** | **Topics** |
| 1 | Motion  2D Motion  Forces | 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. Circular motion and rotation  1. Uniform circular motion  2. Torque and rotational statics |
| 2 | Work and Energy  Momentum and Impulse  Simple Harmonic Motion and Sound  Fluids | A. Work, energy, power  1. Work and work–energy theorem  2. Forces and potential energy  3. Conservation of energy  4. Power  B Systems of particles, linear momentum  1. Impulse and momentum  2. Conservation of linear momentum, collisions  C. Oscillations and gravitation  1. Newton’s law of gravity  2. Circular orbits of planets and satellites  D. Wave motion (including sound)  1. Traveling waves  2. Wave propagation  3. Standing waves  4. Superposition  E. Fluid Mechanics  1. Hydrostatic pressure  2. Buoyancy  3. Fluid flow continuity  4. Bernoulli’s equation |
| 3 | Thermodynamics  Electrostatics  Electric Circuits  Electromagnetism | A. Temperature and heat  1. Mechanical equivalent of heat  2. Heat transfer and thermal expansion  B. Kinetic theory and thermodynamics  1. Ideal gases  a. Kinetic model  b. Ideal gas law  2. Laws of thermodynamics  a. First law (including processes on pV diagrams)  b. Second law (including heat engines)  C. Electrostatics  1. Charge and Coulomb’s law  2. Electric field and electric potential (including point charges)  D. Conductors, capacitors, dielectrics  1. Electrostatics with conductors  2. Capacitors  a. Capacitance  b. Parallel plate  E. Electric circuits  1. Current, resistance, power  2. Steady-state direct current circuits with batteries and resistors only  3. Capacitors in circuits – steady state  F. Magnetic Fields  1. Forces on moving charges in magnetic fields  2. Forces on current-carrying wires in magnetic fi elds  3. Fields of long current-carrying wires  E. Electromagnetism  1. Electromagnetic induction (including Faraday’s law and Lenz’s law) |
| 4 | Atomic and Nuclear Physics  Light and Optics  REVIEW for AP EXAM | C. Atomic physics and quantum effects  1. Photons, the photoelectric effect, Compton scattering, x-rays  2. Atomic energy levels  3. Wave-particle duality  D. Nuclear physics  1. Nuclear reactions (including conservation of mass number and charge)  2. Mass–energy equivalence  E. Physical optics  1. Interference and diffraction  2. Dispersion of light and the electromagnetic spectrum  F. Geometric optics  1. Reflection and refraction  2. Mirrors  3. Lenses |

Adapted from: AP Physics Course Description. The College Board. 2011. p.13-15. http://apcentral.collegeboard.com