**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 | Motion2D MotionForces | 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 motionB. 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 EnergyMomentum and ImpulseSimple Harmonic Motion and SoundFluids | A. Work, energy, power 1. Work and work–energy theorem 2. Forces and potential energy 3. Conservation of energy 4. PowerB Systems of particles, linear momentum1. Impulse and momentum 2. Conservation of linear momentum, collisionsC. Oscillations and gravitation1. Newton’s law of gravity2. Circular orbits of planets and satellitesD. Wave motion (including sound) 1. Traveling waves2. Wave propagation 3. Standing waves 4. SuperpositionE. Fluid Mechanics 1. Hydrostatic pressure 2. Buoyancy 3. Fluid flow continuity  4. Bernoulli’s equation  |
| 3 | ThermodynamicsElectrostaticsElectric CircuitsElectromagnetism | A. Temperature and heat1. Mechanical equivalent of heat 2. Heat transfer and thermal expansion B. Kinetic theory and thermodynamics1. Ideal gasesa. Kinetic modelb. Ideal gas law2. Laws of thermodynamicsa. First law (including processes on pV diagrams) b. Second law (including heat engines)C. Electrostatics 1. Charge and Coulomb’s law2. Electric field and electric potential (including point charges)D. Conductors, capacitors, dielectrics1. Electrostatics with conductors2. Capacitorsa. Capacitanceb. Parallel plateE. Electric circuits1. Current, resistance, power2. Steady-state direct current circuits with batteries and resistors only3. Capacitors in circuits – steady stateF. Magnetic Fields1. Forces on moving charges in magnetic fields2. Forces on current-carrying wires in magnetic fi elds3. Fields of long current-carrying wires E. Electromagnetism  1. Electromagnetic induction (including Faraday’s law and Lenz’s law) |
| 4 | Atomic and Nuclear PhysicsLight and OpticsREVIEW for AP EXAM | C. Atomic physics and quantum effects1. Photons, the photoelectric effect, Compton scattering, x-rays 2. Atomic energy levels 3. Wave-particle dualityD. Nuclear physics1. Nuclear reactions (including conservation of mass number and charge)2. Mass–energy equivalence E. Physical optics1. Interference and diffraction 2. Dispersion of light and the electromagnetic spectrumF. Geometric optics1. Reflection and refraction 2. Mirrors 3. Lenses  |

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