AP Physics 1

Teacher: **Credit:** (1 cr. - Full Year)

Course Description:
AP Physics 1 is an algebra-based, introductory college-level physics course. Students cultivate their understanding of physics through classroom study, in-class activity, and hands-on, inquiry-based laboratory work as they explore concepts like systems, fields, force interactions, change, and conservation. AP Physics 1 is considered one of the more challenging AP exams due to its focus on conceptual understanding and application rather than just memorization.

Prerequisites:
This course requires a strong foundation in Algebraic skills and successful completion of Algebra 1 and Geometry, along with concurrent enrollment in Algebra II or a higher math course. You will need a strong grasp of specific math concepts to handle the calculations and derivations:

- The ability to rearrange equations with multiple variables without using numbers is a critical skill for physics derivations.
- You should be familiar with right triangle trigonometry (SOH-CAH-TOA) for resolving vectors.
- Proficiency in analyzing graphs, finding slopes, and writing linear equations is necessary for interpreting data in labs and exams.

AP Physics 1 is designed to be a **first-year physics course**. You do not need to have taken a regular or honors physics class beforehand.

Standards Assessed:

- Create diagrams, tables, charts, or schematics to represent physical situations.
- Create quantitative graphs with appropriate scales and units, including plotting data.
- Create qualitative sketches of graphs that represent features of a model or the behavior of a physical system.
- Derive a symbolic expression from known quantities by selecting and following a logical mathematical pathway.
- Calculate or estimate an unknown quantity with units from known quantities, by selecting and following a logical computational pathway.
- Compare physical quantities between two or more scenarios or at different times and locations in a single scenario.
- Predict new values or factors of change of physical quantities using functional dependence between variables.
- Create experimental procedures that are appropriate for a given scientific question.
- Apply an appropriate law, definition, theoretical relationship, or model to make a claim.
- Justify or support a claim using evidence from experimental data, physical representations, or physical principles or laws.

Topic Outline:

1st Semester:

- Unit 1: Kinematics
- Unit 2: Force and Translational Dynamics
- Unit 3: Work, Energy, and Power
- Unit 4: Linear Momentum

2nd Semester:

- Unit 5: Torque and Rotational Dynamics
- Unit 6: Energy and Momentum of Rotating Systems
- Unit 7: Oscillations
- Unit 8: Fluids