Physics Course Outline

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Description of Course

Students will develop the skills and processes of science through investigations and relevant research. Both curricula are based on the Physics Core Learning Goals and Next Generation Science Standards (NGSS) and incorporate the Common Core State Standards for Literacy in Science, and Technical Subjects. In addition to these, the Honors Physics Curriculum also incorporates Physics Standards from the Science College Board Standards for Success. These courses are designed to provide students with a solid foundation in physics. In Physics students will develop the skills and process of science through investigations and relevant research. Topics included in the Physics course include:

- Matter and Its Interactions
- Interactions and Conservation Principles
- Motion and Stability: Forces and Interactions
- Interactions and Energy:
- Interactions and Fields:
- Waves and their Applications in Technologies for Information Transfer

WHAT ARE THE COURSE OUTCOMES?

1. To provide the students with opportunities for critical thinking, problem solving, discussion, data analysis, and hands on experiences in order to develop higher order thinking and cooperative learning skills.
2. To master the concepts, rules, relationships, and law of Physics to assist the student in further study of Physics or another related field.
3. To connect real world situations and problems with concepts in Physics in order to better understand and analyze the world around us.

WHAT WILL YOU LEARN IN SEMESTER 1 and 2?

<table>
<thead>
<tr>
<th>Unit</th>
<th>Apx. # of Days</th>
<th>Overview of the Unit</th>
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<tbody>
<tr>
<td>Unit 1 Let's Get Moving</td>
<td>11 Days</td>
<td>In this unit students explore how algebraic and graphical representations describe the motion of an object. The instructional focus is on the development of the kinematic equations and the analysis of the corresponding graphs. The Common Core Reading, Writing standards and Mathematical Practices are embedded throughout the unit.</td>
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<tr>
<td>Unit 2: May the Force Be With You</td>
<td>10 Days</td>
<td>In this unit, students will apply Newton’s law to various scenarios to determine net force and resulting acceleration. This includes special cases where the net force is zero and thus the motion is constant, and movement in a circular path. The Common Core Reading, Writing standards and Mathematical Practice are embedded throughout the unit.</td>
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<tr>
<td>Unit 3: Brute Force</td>
<td>10 Days</td>
<td>In this unit, students extend their understanding of force to include gravitational and electrostatic interactions. Students derive the relationships between mass, separation distance and gravitational force as well as the charge, separation and electrostatic force for various situations. The Common Core Reading, Writing standards and Mathematical Practices are embedded throughout the unit.</td>
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</tbody>
</table>
### Unit 4: You Can’t Change Me 10 Days
In this unit, students will explore how momentum and energy are conserved in various systems. The Common Core Reading, Writing standards and Mathematical Practices are embedded throughout the unit.

### Unit 5: Gone Fission 10 Days
Students will apply the concept of energy conservation to mechanical, Elastic and nuclear energy transfers. The Common Core Reading, Writing standards and Mathematical Practices are embedded throughout the unit.

### Unit 6 Go With the Flow 10 Days
In this unit students will examine and analyze the movement of electrons to create current and thermal energy. The Common Core Reading, Writing standards and Mathematical Practices are embedded throughout the unit.

### Unit 7: Let’s Do the Wave 10 Days
In this unit, students will study the movement of energy in the form of waves. Students will also explore the wave-particle duality and analyze the need to study light as both a wave and a particle. The Common Core Reading, Writing standards and mathematical Practice are embedded throughout the unit.

### Unit 8: Fields of Dreams 10 Days
In this unit students will analyze and explain concepts of electricity, magnetism, force and energy in terms of fields. The Common Core Reading, Writing standards and Mathematical Practices are embedded throughout the unit.

### Standards:
- Maryland State Department of Education (MSDE) – Physics Core Learning Goals
- Science College Board Standards for Success 2009 Page 139
- Next Generation of Science Standards
- Maryland State Department of Education (MSDE) – MD Common Core Curriculum Frameworks
  - Reading/English Language Arts
  - Mathematical Practices

### HOW WILL MY SUCCESS BE MEASURED?
**Grading:** Grades are given to high school students to document progress toward and mastery of course content, skills, and standards. All high school courses shall have a minimum of nine separate assignments or assessments, an average of one grade per week, for course content, skills, and mastery in addition to homework. Each assignment will be assigned a point value. When assignments are returned, the points earned and the point value of the assignment will be on the assignment.

<table>
<thead>
<tr>
<th>Assignments</th>
<th>Description</th>
<th>Eligibility for assignment redo</th>
<th>Late Policy</th>
<th>If Absent Policy</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Homework</td>
<td>Lesson based assessments both electronic and paper will be assigned. Projects both Unit and Science fair will be assigned and completed as homework with limited class time available.</td>
<td>5 redo attempts are automatically provided with each Mastering Physics homework question for full credit. (Except on multiple choice, each incorrect attempt has a penalty). Other homework assignment have no redo option.</td>
<td>Late assignments are accepted for up to 5 days after assignments due date. 10% penalty each day late.</td>
<td>Absences allow for a 5 school day penalty free extension. Must request from teacher **</td>
<td>15%</td>
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<tr>
<td>In class Assessments, Activities, and Labs</td>
<td>Experiments, activities, and questions will be associated with many of the lessons and will vary based on topic and learning goal. In class activities will also be graded as well</td>
<td>2 Redo Assignments are permitted per quarter. The redo assignments must be completed within 10 days of the return of the assignment. You may not earn more than a 100% on any given assignment.</td>
<td>Late assignments are not accepted on in class work. If unable to complete during the provided time then, must be completed during Eagle Hour prior to the next class.</td>
<td>Absences allow for a 5 school day penalty free extension on the assignment. Except for long term assignments which are due by the following class. **</td>
<td>50%</td>
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<tr>
<td>Tests/ Quiz</td>
<td>Formal assessments of student learning will be given periodically throughout the year.</td>
<td>2 Redo Assignments are permitted per quarter on quizzes only. The redo assignments must be completed within 10 days of the return of the assignment. You may not earn more than a 100% on any given assignment.</td>
<td>If not completed during class (run out of time) then must be completed outside of class by 3pm the following day. Otherwise completed grade will be taken.</td>
<td>Students absent on test day have 5 school days to take the assessment after school and 5 additional school days to redo the assessment. **</td>
<td>35%</td>
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<td>Benchmarks</td>
<td>Formal assessments given at the end of every quarter.</td>
<td>No Redo’s accepted as per county policy</td>
<td>MUST BECOMPLETED ON SCHEDULED DAY!!!</td>
<td>Student has 5 school days to make it up otherwise the test will be a zero **</td>
<td>20%</td>
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During the 1st and 3rd quarter a Quarterly Assessment will be given by the county. This assessment will count for 10% of the quarter grade. The 10% will be taken half from the In Class Assessments and half from the Test sections. Please contact the teacher for clarification if needed.

**Alternative arrangements may be made for extended absences**

**Redo Assessments:** To qualify, students must have completed and submitted the original assessment showing good faith effort (90% complete), activity, or assignment by the due date and must have participated in the teacher-facilitated reteaching (before, during, or after school) within five school days following the return of the original graded work. Within ten school days of receiving the returned original graded work, students must complete and submit the new assessment, activity, or assignment.

**Good Faith Effort:** Good Faith Effort on an open notes assignment is shown by completing every question with work and/or a reference to the relevant notes section. Good Faith Effort on a closed notes assessment is show by completing a teacher assigned review assignment with at least 75% correctness.

**Electronics Policy:** There is a zero tolerance policy for unauthorized electronic devices (i.e. cell phone, mp3 player, iPod, etc.) in this course. If an unauthorized electronic device is seen it will be confiscated and placed in a secured location. Refusal to hand over the device will result in removal from the classroom and a phone call home. Repeated offenses will obtain a phone call home and a final warning. If the problem persists the student will relinquish the device to the secured location upon entry into the classroom. An unauthorized electronic device seen during any assessed activity, assignment, or assessment will result in a zero. The instructor holds no responsibility for any harm, damage, or loss resulting from the sequestering of the device.

***All classroom and grading policies are at teacher’s discretion. ***

The marking period grades, based upon the final percentage of points earned divided by possible points, shall be calculated to the tenths place and then rounded to a whole number (.5+ rounds up). The percentage grade for each marking period and semester final exam will appear on the report card. The final grade for each semester in high school shall appear on the report card as both a percentage and a letter grade using the following scale:

- 100% - 90% A Excellent mastery of standards is evident.
- 89% - 80% B Advanced mastery of standards is evident.
• 79% - 70% C Acceptable, average mastery of standards is evident.
• 69% - 60% D Partial mastery of standards is evident.
• 59% or less E Minimal or no mastery of standards is evident.

Please see the Grading Policy Regulation for additional details related to high school grading.  
http://www.aacps.org/aacps/boe/board/newpolicy/Sections/section_600/adminregIIIRA.pdf

**Parent Notification of Student Grades:**
- Parents should sign up for Parent Connect to monitor student grades
- Interims will be provided about midway into marking period
- Report cards distributed at the end of each marking period

Parents should review assignments with students to monitor student progress and determine if students have missing or late assignments. Parents may contact the teacher for missed assignments or late assignments.

Please refer to the county grading policy for further information.

**Materials**

1. Students will be provided with a copy of the text book and review book, which they should cover and maintain at home. A class set will be provided for class work.

2. **A calculator with the ability to handle trigonometric functions is required.** A graphing calculator is not. The TI-30x IIS is an excellent choice for those not wishing to spend large sums of money.

3. **Students MUST also have a pen or pencil, paper or notebook, and a binder or folder during every class.**

**Equipment:**

The lab equipment and electronic equipment (computers, ipads, senteos, etc.) used in the Physics classes are purchased by the School and Science Department. Due to the large expense of the equipment provided for student use Administrative Referrals will be given for destruction of school property (computers, equipment, etc...) and the cost of replacements will be forwarded evenly to all students using the equipment at the time of destruction.

**Lab Fee**

- A $5 lab fee is required from Physics students to cover the cost of consumable lab materials.

**Academic Integrity**

- All policies and consequences from the Anne Arundel County Public School’s Academic Integrity Policy will be followed in this course. - http://www.aacps.org/aacps/boe/board/newpolicy/Sections/section_600/adminreg613.pdf

I have read and understood the above information contained in this course outline:

Student Signature: ____________________________ Date: ____________

Parent Signature: ____________________________ Date: ____________