Honors Physics
Syllabus 2019-2020
Broken Bow High School
Instructor: Mr. Hall

Course Description:

The goal of this course is for students to obtain a general knowledge of the fundamental principles of basic physics and their application to the world around us. Classroom discussion/lecture is used to support and enhance laboratory procedures and investigations into physics concepts and phenomena. The overall goal is to provide students with the scientific skills to understand the science of physics allowing their interest and knowledge in the natural world to expand. Development of a student’s skills in asking questions and defining problems, creating and using models, analyzing and interpreting data, mathematics, planning and carrying out investigations, constructing explanations, evidentiary support of arguments and conclusions, obtaining and evaluating information for scientific communication will also be a course goal. With these science skills, students should able go beyond the textbook into science of everyday life.

Specific Learning Outcomes:

By the end of this course, students will be able to:

- develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.
- analyze data to support the claim that Newton’s second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.
- use mathematical representation to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.
- apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.
- use mathematical representations of Newton’s Law of Gravitation and Coulomb’s Law to describe and predict the gravitational and electrostatic forces between objects.
- plan and conduct an investigation to provide evidence that and electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.
- create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.
- develop and use models to illustrate that energy at the macroscopic scale can be accounted for as either motions of particles or energy stored in fields.
- design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
- plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).
- develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction.
- use mathematical representation to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.
- evaluate questions about the advantages and disadvantages of using a digital transmission and storage of information.
- evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.
- evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.
- communicate technical information about how some technological devices use the principles of wave behavior and wave interaction with matter to transmit and capture information and energy.

Instructor Expectations of Students

As the instructor of this class, my expectations of students are that students in this honors class are enrolled to improve their understanding of science, specifically physics. Students will be expected to participate in classroom discussion, laboratory and non-laboratory investigations, and to complete assignments outside of the classroom. Students will be expected to participate and complete tasks inside and outside the classroom with respectful, responsible behavior and actions. Students are expected to limit their use of cellphones/smart watches/technology to classroom activities.

Course Requirements:

The tasks and assignments in this course will strive to be aligned with the Oklahoma Academic Science Skills for High School Physics.
1. Class attendance policy: Attendance will follow school policy; however, mastery of the content in this class may be difficult to achieve with repeated, multiple absences. In the event of an absence, it is the student’s responsibility to obtain any missed assignments, notes, and/or makeup quizzes or tests. It will be the student’s responsibility to arrange for help from the instructor outside of their normal classroom times so as not to disrupt normal classroom procedures (see following times).

   Additional Times for help/tutoring:
   - During Mr. Hall’s 3rd Hour conference/planning period (Must be arranged ahead of time with Mr. Hall and student must provide a permission slip from the 3rd hour teacher).
   - During lunch (best time) (Please check in with the duty teacher in the hallway and knock on the door if closed). Again, arrangement with Mr. Hall will work best.

2. Course materials and readings:
   - (a) Textbook: *Holt McDougal - Physics*. This textbook will be for classroom use only (will not be checked out). An electronic forms of the book should be available online (requires set-up of an account by the instructor). A *pdf* file may also be available on request. An older version of the book will be available for checkout.
   - (b) Course presentations and other relevant materials may be requested from the instructor.
   - (c) A small 3 ring binder or notebook with pockets is suggested.
   - (d) Various materials such as glue, paper, may be needed.

   Additional Resources
   Additional resources may be distributed during class (these are for use in the course over the whole school year). The use of most internet search engines will provide a tremendous amount of information, but please use it wisely. It may provide you the answer to any number of problems, but you as the student will be expected to know the concepts and techniques used to understand and solve those problems to arrive at that answer *(Be aware internet obtained answers may not be correct and will identify when students do not do their own work)*.

Grading Procedures:

A Total Points grading system is used in this class. Students will be asked place their *name and the date the task is assigned* in the top right corner of each assignment. Make sure to take ownership of your work in order to receive credit for work completed.

A student’s class average for each nine weeks will be based on the following:

- **Exams** - Will be approximately 40% of the overall possible points
- **Labs/Projects** - about 30%
- **Quizzes** - about 10%
- **Other assignments** - about 20% (classroom participation, daily work, written assignments)

*These are approximate percentages and may very slightly due to the number and types of each graded assignment in a grading period. Example: There may be more labs in the 2nd nine weeks than the 1st nine weeks. Averages will be affected by some assignments to a greater degree do to the type and scope of that particular assignment. Example: A lab may take several days to complete so there may be a lab grade and a participation grade given for that task.*

**Grading Scale**: (the rounded average will be used as shown by the online grade book system)

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<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>90-100%</td>
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<tr>
<td>B</td>
<td>80-89%</td>
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<tr>
<td>C</td>
<td>70-79%</td>
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<tr>
<td>D</td>
<td>60-69%</td>
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<tr>
<td>F</td>
<td>59% or less</td>
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**Semester Grade**: The semester test may be up to 20% of the semester grade and as such may really affect a student’s final grade used to calculate their GPA. Absence based exemptions are possible.

Example: *(1st 9 weeks x 40%) + (2nd 9 weeks x 40%) + (Semester test x 20%) = Semester Grade*
Late Work:

It is the student’s responsibility to obtain and complete any missed assignment(s). Students will have the time stated by the student handbook to complete and turn in any missed assignments when absent for any reason (sickness or school related). If a student must be absent on the day of an exam these conditions will apply:

- If the student was aware of the exam/exam date (exam notification usually occurs several days in advance) then the exam must be taken during the next class period attended after the absence.
- If the student was not aware of the exam, then a time must be arranged with the instructor to makeup the missed exam. It is the student’s responsibility to make sure they are prepared and to make up the exam along with obtaining and completing any assignments that occur during the process of making up a missed exam.
- Late work may be accessed either a penalty of 50% reduction in total assignment value or the actual grade if less than previously stated 50% penalty. Exceptions are at the discretion of Mr. Hall, but will be done in a manner that is fair to all students. Students must be aware of assigned due dates.

Academic Integrity

Students will be expected to follow school policies at all times pertaining to conduct and ethics as stated in Broken Bow High School Student Handbook. Academic honesty is an expectation of each and every student. Academic dishonesty may result in the student receiving a grade of zero at the discretion of Mr. Hall. If a student wishes to protest a grade, please submit a complaint in writing to the instructor. Grading will occur in an unbiased manner providing no student with a disadvantage or advantage when compared to other students in the class. If a grading error is suspected, a student should arrange a time to discuss it with the instructor at a time that will not disrupt normal class time.

Accommodations for students with disabilities

In compliance with the Broken Bow High School and the Americans with Disabilities Act (ADA), the faculty, staff, and administration at Broken Bow Schools will be available to discuss appropriate academic accommodations that may be required for student with disabilities.

Inclusivity Statement

Students in this class may represent a variety of backgrounds and perspectives. Broken Bow Schools and this class are committed to providing an atmosphere for learning that respects diversity. While working together to make this classroom a great learning environment, I ask all students to: share their unique experiences and values, honor the uniqueness of their colleagues, appreciate the opportunity that we have to learn from each other in this classroom, value each other’s opinions and viewpoint, communicate in a respectful manner, and keep confidential, discussions that a student may put forth of a personal nature.

Notification:

Broken Bow Schools and Mr. Hall reserve the right to amend the statements and terms of this syllabus. Students may request an updated syllabus if changes do occur.