RVGS AP Physics C Mechanics

Syllabus updated Aug 2022

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**Course Description**

AP Physics C is the equivalent to a first year college Mechanics Course for science and engineering majors. Topics include Kinematics, Forces, Newton’s Laws, Energy, Momentum, Rotational Dynamics, Gravity, and Oscillations. Emphasis is placed on the use of technology for data collection, analysis, and lab report presentation in order to enhance self-directed learning. Use of outside resources is encouraged. Computer use includes modeling, graphing, lab interfacing, and video analysis. Individual and/or group explorations at an advanced level will be required during the year. AP Physics C is a very challenging course and students must be actively engaged in completing assigned homework. Students are expected to obtain a qualifying score of 3, 4, or 5 on the AP Physics C Mechanics exam at the end of this course.

**Gifted education strategies**

Differentiation: Instructor will differentiate/modify the curriculum and his instructional methods in response to the needs, strengths, learning styles, and interests of individual students so that all students have an opportunity to learn at their full potential. Differentiation typically involves modifying instruction in terms of content (skills to be learned), process (activities designed to teach the skills), and product (projects and assessments that demonstrate the extent to which the skills were learned).

An Emphasis on Higher-Level Thinking. Students need to learn about important physics concepts and also to manipulate those concepts in complex ways. Having students analyze the relationship between real world problems and seeing the connections between physics and society provides opportunities for both critical and creative thinking within a problem-based episode.

An Emphasis on Inquiry, Especially Problem-Based Learning. The more that students can construct their understanding about physics for themselves, the better able they will be to encounter new situations and apply appropriate scientific processes to them. Through guided questions by the teacher, collaborative dialogue and discussion with peers, and individual exploration of key questions, students can grow in the development of valuable habits of mind found among physicists.

Higher Order Thinking: Advanced questioning in discussions and providing activities based on the six levels of the ‘Revised Bloom’s Taxonomy of Higher-Order Thinking Skills.’ The process verbs, activities, and products range from simple and factual thinking to more complex and abstract levels of thinking.

An Emphasis on Learning the Scientific Process, Using Experimental Design Procedures. Design activities will be used in the classroom to expose students to the design cycle and the need to work collaborative.

****Text****, Printed Resources, and Media Resources

*Physics for Scientists and Engineers,* Tipler and Mosca, New York: W. H. Freeman. Sixth edition.

****Grading**** Policy

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| --- | --- | --- | --- |
| Grading Scale |  | Grading Categories |  |
| 100-90% | A | Exam | 15% |
| 89-80% | B | Tests | 35% |
| 79-70% | C | Quizzes | 25% |
| 69-60% | D | Homework | 15% |
| 59-0% | F | labs | 10% |

Categories

Exams: are comprehensive and at the end of each semester.

Tests: Tests are comprehensive and at the end of each unit. Tests will consist of multiple choice and free response problems that resemble AP Physics type questions.

Quizzes: There will be a large number of quizzes and a wide variety including reading quizzes, lab quizzes, pop quizzes, free response practice quizzes, lecture clicker quizzes, and multiple choice quizzes.

Laboratory Experiments: Laboratory experiments will be administered typically once a week. The course includes a laboratory component comparable to a semester-long, college level physics laboratory. Each student will spend a minimum of 20 percent of instructional time engaged in laboratory work. A hands-on laboratory component is required.

Homework: Students can expect to get approximately 20 minutes of homework every day in AP physics as it is necessary to have a lot of practice in problem solving to master each concept.

**Late Work**

Deadlines on all homework and labs will be critical. Prior contact with the teacher before a deadline is necessary for consideration of extensions. Contact after a missed deadline is inadequate. Late homework will be half credit. No late homework will be accepted after 2 days. Major assignments including labs will lose 10% per calendar day.

Final Grade Determination

The final grade is the average of the 2 semester grades. Students who fail to maintain a B average or above will be subject to the RVGS probationary policy.

****Class**** Policies and Procedures

* **Make-up assessments**: If a student is absent the day prior to an assessment of any kind (i.e. quiz, test, exam), including review days, the student will be expected to take the assessment on the scheduled day. Note this includes extra-curricular activities. If a student is absent the day of an assessment of any kind (i.e. quiz, test, exam), the student will be expected to take the assessment the day they return to school. Note this includes extra-curricular activities.
* **Cheating:**  The policy in the RVGS student handbook policy will be followed.
* **Technology Policy:** The RCPS Acceptable Use Policy and the RVGS student handbook policy will be followed.
* **Extra help:** It is inevitable that there will be times when a student may not grasp a concept the first time. Extra help is always available, but it is to the student to seek help as soon as possible. The following options are available to the student for extra help, but the student should be sure to make arrangements with your instructor to make sure that he is available at a given time:
* **Before School** (arrangements must be made the previous day)
* **During Lunch** (arrangements must be made the previous day)
* **Communication** email is my preferred communication.
* **Synergy:** Grades are available at all times through Synergy.
  + A blank in the grade book means that the assignment has not yet been graded. Teachers will have all assignments graded within 5 school days of the due date (with the exception of very long assignments which will be graded within 10 school days). You may have a blank because the teacher has not graded the class set or because your assignment was turned in after the due date. Blanks do not count as zeros in your average.
  + A zero in the grade book means that you have earned a zero on the assignment. Cases in which this might occur include submitting incorrect answers to an assignment or submitting an assignment past the due date.
  + An excused (EX) in the grade book means that you are excused from the assignment without penalty.
* **Interim Reports:** The interim report is a snapshot of the current class average. Please feel free to discuss your report with your instructor.
* **Student Performance Strategy**: Interventions will be implemented at the teacher’s discretion or in the event that the student's grade falls below an 80.

General classroom procedures:

* **Cell Phones** are not to be used in class at any point in time. See RVGS student handbook policy.
  + Any student found with a cell phone during an assessment (quiz, test, or exam), will receive a zero on the assessment.
* **Personal computers or school assigned computers** are not allowed for use in the classroom unless authorized by the instructor.
* **Calculators** are an integral part of the technology used in this class and the expectation is that the student brings the calculator to school every day.