

Roanoke Valley Governor's School for Science and Technology

AP Physics C

Syllabus 2018-2019

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I. Course Information

a. 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.

b. Gifted education strategies

- i. 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)..
- ii. 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.
- iii. 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.
- iv. 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.

- v. **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.

II. Grading Policy

a. Grading Scale

100-90%	A
89-80%	B
79-70%	C
69-60%	D
59-0%	F

b. Types of Evaluations

- i. **Tests:** Tests will take place at the end of each unit. There will typically be five to six tests as well as a comprehensive Final Exam during each semester. The Final Exam will count 15% toward the student's final semester grade. Tests will consist of multiple choice and short answer problems that resemble AP Physics type questions. Some of these will be actual questions from past exams. Students will receive a one-week notice before these tests occur. All tests are out of 100 points. Tests will mimic the AP test in length. Generally, students will do the multiple choice portion of the test on the first day and the free response portion the following day.
- ii. **Quizzes:** Low risk quizzes may occur daily or when the teacher feels he needs to check for student mastery of a subject. There will be several quizzes per unit to help students prepare for that final unit exam. This grading category will include reading quizzes, lab quizzes, pop quizzes, free response practice quizzes, lecture clicker quizzes, and multiple choice quizzes.
- iii. **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.
- iv. **Homework:** Students can expect to get approximately 45-60 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. Students will be given several problem sets each week typically through WebAssign, but can include the University of Texas (UT) to help reinforce what they discovered in class each day. Homework will typically be out of 10-20 points depending on the assignment.

c. Semester Grade Determination

Category	Weight
Final Exam	15%
Exams	35%
Quizzes	25%
Homework	15%
Laboratory Experiments	10%

d. 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.

III. Class Policies and Procedures

- a. Absences and tardies:** The policy in the RVGS student handbook will be followed.
- b. Make-up Work:** If an absence is unplanned, a student will be allotted the same number of days to make up the work as they were absent (i.e., if they were absent for 2 days, they would have 2 days to make up the work.) 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. If the student is absent the day of a lab/in-class activity or the day a set of daily questions are asked, see the policy under the grade breakdown
- c. Late-work policy:** All WebAssign and UT homework must be completed by the due date. No additional time will be given for and WebAssign and UT homework. For all other assignments, if an assignment is turned in late, the max credit will be lowered by one letter grade. After 4 days late, the assignment will not be accepted for credit.
- d. Cheating:** The policy in the RCPS student code of conduct will be followed.
- e. Technology Policy:** The RCPS Acceptable Use Policy and the RVGS student handbook policy will be followed.
- f. 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:
 - i.** Before School (arrangements must be made the previous day)
 - ii.** During Lunch (arrangements must be made the previous day)
 - iii.** Remind Messaging: ***This is my preferred method of communication.*** I will typically respond very quickly via this method and will answer your question or set up a later time where we can discuss your question by email or telephone.
 - iv.** Email

- v. Telephone
- g. **Home Access Center:** Grades are available at all times through Home Access Center. When viewing your grades, understand that:
 - i. 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.
 - ii. 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.
 - iii. An excused (EX) in the grade book means that you are excused from the assignment without penalty.
- h. **Interim Reports:** A hard-copy of your current grade will be given to you to take home three times during each semester (see dates on the school calendar). The interim report is a snapshot of the current class average. Please feel free to discuss your report with your instructor.
- i. **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.
- j. **General classroom procedures:**
 - i. Personal Electronic Equipment:
 1. Cell Phones are **not to be used in class at any point in time**. See RVGS student handbook policy.
 2. Any student found with a cell phone during an assessment (quiz, test, or exam), will receive a zero on the assessment.
 3. MP3 players may not be used in class or during any assessment.
 4. Personal computers or school assigned computers are not allowed for use in the classroom unless authorized by the instructor.
 - ii. Calculators: The student's calculator is an integral part of the technology used in this class and the expectation is that the student brings the calculator to school every day.