

# Physics at Trinity Valley School – 2006-2007

This course introduces the students to the physics of the real world. It uses all the mathematical tools of introductory physics (Algebra, Geometry and Trigonometry including introductions to Graphing, Graphical Analysis, and a bit of Calculus) to explore the wide variety of topics included in a typical survey course.

Topic areas include:

- Forces of all types: Push, pull, tension, buoyancy, gravitational, electrical, magnetic, frictional, etc. (*What makes things move the way they do.*)
- Conservation Laws: Energy, momentum, angular momentum
- Laws of Motion or kinematics
- Energy – potential (*positional*) and kinetic (*motional*)
- Momentum, changes in momentum, and collisions
- Gravitation, including gravitational force and gravitational potential energy and Newton's Law of Universal Gravitation.
- Work (*How much energy does it take to get things moving & keep them moving.*)
- Simple resistive and RC circuits – voltage, current, resistance, and capacitance
- Magnetic and electric fields
- Fluids, pressure and buoyancy
- Introduction to calculus
- Simple machines
- Uniform circular motion
- Rotational motion and angular momentum
- Mirrors and lenses
- Thermal properties of matter and thermodynamics
- Nuclear properties and radioactivity
- Special Relativity (*time permitting*)

The course includes a comprehensive laboratory section. Labs are held one day each week. Lab write-ups are due one week later. Specific lab questions will be do sometime after that.

Homework assignments and the questions at the end of each lab write-up are all handled using an internet-based collection system called WebAssign. All students must use computers, both on campus and at home, to download these assignments and to submit their answers. Use of the internet is not optional.

Grades during a Quarter are determined as follows:

- 10% – Homework – these can be printed and the answers submitted from any computer with an internet connection.
- 30% – Quizzes – these are based on homework assignments already completed.
- 30% – Labs – Write-ups, Lab WebAssignments, lab quizzes and lab practicals.
- 30% – Chapter Exams.

## What is Expected of Students in Physics

Students need to be in class every day. Missing class for any reason can interfere with learning and affect the grade of any student.

Assignment due dates are clearly posted on the classroom board. All HW assignments are due by 9:25 am on the due date unless otherwise indicated. All assignments, HW and Lab write-ups, mostly, must be turned in on time.

Students must arrive prepared to take notes, take quizzes, answer questions and complete calculations either singly or with the group. On exam days the exam will take the entire period, so students must arrive early and be prepared to start when the bell rings.

Quizzes may be daily on any topic of current interest in the class. Quizzes may be given any day and average around 3 per week.

Students must be respectful of the instructor, other students in class, and of the equipment and premises. Intolerance and disrespect for people and property are not allowed.

Students must keep their old assignments, class notes, and assignments-in-progress in a 3-ring binder. The 3-ring binder must accompany each student to class every day; along with their calculator, spiral notebook and a small supply of unbound notebook paper. The instructor may examine these materials on any day and a quiz grade assessed based on the completeness of the package.

Homework Assignments count for 10% of each student's quarterly grade. Doing the homework is essential for understanding the material, and for getting good quiz grades. The Homework schedule is posted on the front board at all times.

Lab Assignments and Lab Write-ups count for 30% of each student's quarterly grade. The Lab schedule is posted on the front board at all times.

Daily Quizzes grades count for 30% of each student's quarterly grade. Quizzes are not announced. They may occur any day and cover any previously or currently studied topic.

Chapter Exams count for 30% of each student's quarterly grade. The date of the next exam will be posted about one week ahead of time.

Students who are tardy 2 or more times a quarter will receive a 2 in effort and discipline. Additional tardiness will result in additional adjustment to the effort and discipline grades.

Students who miss two assignments or who turn in two late lab write-ups per quarter will receive a 2 in effort. Additional missed lab write-ups will result in additional adjustments to the effort grade.

Effort and discipline grades are also affected by other factors, including but not limited to behavior and treatment of others and respect for the premises and equipment in the lab. Violations of school rules can also affect the effort and discipline grades.

Students need to work on Physics every day. At least one hour each night needs to be devoted to Physics. This includes reading the textbook, working on HW assignments, or working on lab write-ups. If they work efficiently, then one hour should be enough. If the work inefficiently, talk on the phone, listen to music, play games or simply day-dream, then it is going to take much more than one hour each night.

Remind them that the grade is theirs to earn. The more work they do, the better the grade will be. Don't let them say that they are not good at math, or not good at Physics. They are too young for these perceived limitations to be anything but temporary. Effort still pays off if they will only make the effort.

Every year the students who are going to get the lowest grades self-select themselves. It is precisely those students who stop working that inevitably get the lowest grades and do worst on the exams. It is simple. Work and do well. Stop working and do poorly or even fail.