

Physics

Course Outline

Mr. Lew

TEXT: *Active Physics*
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COURSE OVERVIEW: This class is an algebra-based physics course designed for all freshmen. Students experience and will be engaged in the traditional concepts of mechanics, light, waves, thermodynamics, and electricity. Instruction methods follow the research-based “guided-inquiry” model that capitalizes on hands-on and cooperative learning methods where students construct their knowledge and find answers to their questions as they are guided through labs and activities. This course structure provide a foundation that allows students to demonstrate their knowledge through group projects called “challenges.” Depth over breadth of material and the development of students’ problem-solving skills will be emphasized. Students should leave the course with a firm conceptual understanding of physics and the nature of science. In addition students are introduced to electronic data collection and analysis.

COURSE OBJECTIVES:

1. To explore and better understand the nature of science.
2. To inspire students to view God’s creation through a fascinating lens. As St. Ignatius of Loyola said, “Find God in all things.”
3. To gain firm understanding of basic physics concepts in mechanics, light, thermodynamics, waves, and electricity.
4. To apply the scientific method in solving physics problems and gain insight into solving other types of problems.
5. To exercise and refine analytical problem solving skills.
6. To be able to use an electronic spreadsheet (Microsoft Excel) and data acquisition program (Datastudio) to model and solve various types of physics practical problems.
7. To learn to work in small and large groups in preparation for university work.

SUPPLIES NEEDED:

1. Physics textbook
2. Scientific Calculator and extra batteries (no iPhone, iPod, or other non-dedicated calculators with Wi-Fi capabilities)
3. 2 SPIRAL graph paper notebooks
4. Pencil, pen, and highlighter (preferably yellow)

TEST/QUIZ/LAB POLICY

1. Partial credit will be given when **relevant** work is done.
2. Make-up tests/quizzes/labs will be given ONLY on EXCUSED absences.
3. If absent on a test day, the make up test will be given on the first day back.

HOMEWORK POLICY

1. Late homeworks will received 1/2 credit.
2. Homework problems should be done in the homework graph paper notebook.
3. Homework problems numbers should be highlighted.
4. Homework solutions that include spreadsheet solutions should include both the data tables and plots. Data tables and plots should be trimmed and taped neatly into the journal.
5. Homework is due at the beginning of class, otherwise it is late.

GRADE ALLOCATION:

Personal Points 5%
 Notebooks 35% (Homework Notebooks 25%, Lab Notebooks 10%)
 Assessments 40% (Tests 20%, Quizzes 10%, Final 10%)
 Challenges 20%

GRADING SCALE (all numbers are in percent):

A	Grade ≥ 95	D+	$67 \leq$ Grade < 70
A-	$90 \leq$ Grade < 95	D	$63 \leq$ Grade < 67
B+	$87 \leq$ Grade < 90	D-	$60 \leq$ Grade < 63
B	$83 \leq$ Grade < 87	F	Grade < 60
B-	$80 \leq$ Grade < 83		
C+	$77 \leq$ Grade < 80		
C	$73 \leq$ Grade < 77		
C-	$70 \leq$ Grade < 73		

Loyola High School

Physics Department

Lab Safety Guidelines

While no human activity is completely risk free, it is our goal to provide an environment in which students can engage in the process of science through laboratory investigation without injury or threat to their health. In the process of studying the universe through the process of scientific investigation, our students should learn and practice laboratory “common sense” to conduct themselves in a safe and responsible manner.

I. General Student Laboratory Guidelines:

1. Perform laboratory work only when your teacher is present. Unsupervised laboratory experimentation is not allowed.
2. Stay on task. Follow directions. Unauthorized experimentation is prohibited. Do NOT push, shove, run, or throw objects during laboratory work - these can pose serious threats to the safety of you and your classmates.
3. Think about safety each time you do a laboratory investigation. Read over directions and plan out what you will do before you begin working.
4. Know the location and use of all safety equipment in your laboratory. These should include the first-aid kit and fire extinguisher.
5. Tie back loose hair and clothing before starting your work.
6. Clear benchtop of all unnecessary materials such as books and clothing before starting our work.
7. Follow all instructions given you by your teacher in the use of equipment.
8. Keep lab equipment away from the edges of the lab bench.
9. Any laboratory accident, however small, should be reported immediately to your teacher.
10. Minor skin burns should be placed under cold, running water.
11. Never taste or touch laboratory chemicals unless directed to do so by your instructor. Gum, food, or drinks should not be brought into the laboratory classroom.
12. Before leaving the laboratory, make sure that gas lines and water faucets are shut off.

II. Mechanic Laboratory Guidelines

1. Be careful in handling the masses. Dropping the masses can damage the floor or cause bodily injury.
2. Do not stretch springs beyond their “elastic” limit.
3. Be careful to catch the dynamics cart before they roll off the table.

II. Electricity and Magnetism Laboratory Guidelines

1. Never touch a bare wire (especially if your hands are wet)! Be extremely careful with the “live wires.” Never touch a positive terminal with a negative terminal.
2. Before measuring electric current with the digital multimeters, always check the “current” setting on the multimeter (if you measure a current greater than the current setting, you risk blowing the multimeter’s fuse). When in doubt, ask your instructor for assistance.
3. Never create your own circuits without the permission of your instructor. If you are not sure about certain circuit connections, ask for help from your teacher. Don’t just plug it in and just “see what happens.”
4. When diluting acid with water, always add the acid to the water.
5. Handle thermometers with care, they are fragile instruments. Do not leave them near the edge of the table. If a Mercury thermometer breaks, do not attempt to clean up or pick up the pieces. Notify your instructor immediately.
6. When discarding used materials or chemicals, carefully follow the instructions provided by your instructor. Never discard matches, filter paper or other solids in the sink.

III. Optics

1. Never directly look at any light source or laser.
2. Never point a laser at another person, especially at another’s facial area.

If you aren’t sure... ASK!

Physics Personal Point Agreement

I, _____, understand that at the beginning of each semester I will receive 100 personal points, which is part of my point total for the semester. I will be able to maintain my 100 points of “personal points” unless the any one of the following rules are violated:

Please initial each violation in the left hand margin as they are read in class.

1. BE A NICE GUY – Do NOT disrupt class (not taking notes, talking during lectures, horseplaying in lab, eating/drinking in class, inappropriate language, etc.)
2. BE A GOOD STUDENT – Bring all class supplies to class (book, notebooks, pencil, pen, calculator, or NOT bubbling in name on scantrons for tests and quizzes, usage of electronic devices for non-physics purposes, sleeping in class, using bathroom during class*, getting water during class**.)
3. BE A NEAT PERSON – Do NOT leave trash in your area, pick up any existing trash in your area, place all lab equipment back in its original location, place computers back into laptop cart and plug in power adapters when you are done using the computer.)

*Each student will be allotted two “bathroom passes” per semester.

** Each student may bring a bottle of “pure, non-flavored” water to class to drink in classroom (not lab) area.

The first violation of these rules will result in a 10 point deduction from your “personal point” total. Each successive violation will result in a deduction of points in a geometric fashion (i.e. second violation = -20 points, third violation = -40 points, fourth violation = - 80 points, fifth violation = -160 points...).

It is therefore possible to have a negative “personal point” total which will be averaged in to your point total for the semester (i.e. severely damage your grade).

I completely understand the above violations and rules for point deductions.

Print Name: _____

Sign Name: _____

Date: _____

LOYOLA PHYSICS HONOR CODE

(Adopted from the University of Michigan School of Engineering Honor Code)

The Loyola Physics Honor Code outlines policies for the ethical conduct of students in AP Physics at Loyola High School.

The policies include:

- a. Students in Physics should be honorable and trustworthy persons.
- b. Personal integrity should be of the highest priority. This includes performance on tests, homework, and laboratory assignments.
- c. It is the responsibility of both the teacher and students of Physics to uphold the principles and policies of the Honor Code.
- d. It is dishonorable and a violation of the Honor Code to receive credit for work that is not the result of their own efforts unless it is part of a group credit score.
- e. Students are responsible to understand the Honor Code and its implementation in Physics.

When Taking an Examination

The Honor Code is based upon the principle that students can be trusted to take examinations without cheating. Therefore, the instructor need not monitor examinations in Physics. Remember, **“...the true character of a man is what he does when no one is looking...”**

After each exam, students must write the Honor Pledge on their test sheets and sign their names under it. The Honor Pledge is as follows:

“I have neither given nor received aid on this individual examination.”

Note: Mr. Lew is not required to grade tests in which the signed Honor Pledge does not appear.

Other written work

Other than cooperative group work, it is a violation of the Honor Code for students to submit, as their own, work which is not the result of their own labor and thoughts. Work which includes material derived in any way from the efforts of another author, either by direct quotation or paraphrasing, should be fully and properly documented. The basic principle is to tell the reader enough to locate the quoted material in the original source. Remember, **“...the true character of a man is what he does when no one is looking...”**

I, _____, have read the Lab Safety Guidelines and Honor Code and understand it in full.

Student Name (printed) : _____ Parent Name (printed): _____

Student Name (signed): _____ Parent Signature : _____

Date: _____

“...the true character of a man is what he does when no one is looking...”