

**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 introduced to classical physics (mechanics, light, waves, and electricity), and modern physics (relativity, and quantum mechanics). 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 (PERS: University of Washington, Solokoff: University of Oregon, Mazur: Harvard University, Knight: Cal Poly SLO.) 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.

**COURSE OBJECTIVES:**

1. To gain firm understanding of basic physics concepts in mechanics, electricity, magnetism, waves, relativity, and quantum mechanics.
2. To apply the scientific method in solving physics problems and gain insight into inductive and deductive types of reasoning.
3. To understanding the Nature of Science in the context of the historical development of science.
4. To exercise and refine analytical problem solving skills.
5. To be able to use data acquisition software (Capstone) to for data collection and analysis.

**SUPPLIES NEEDED:**

1. Physics textbook
2. Scientific Calculator (NO cell phones or calculators with WiFi connectivity are allowed)
3. Three ring binder (1.5") with 5 dividers labeled as listed below:
  - a. syllabus,
  - b. homework,
  - c. labs (gauntlets),
  - d. quizzes,
  - e. tests
4. Loose left graph paper
5. Physics timeline/equation sheet (will be handed out in class)
6. Pencil, pen, and highlighter

**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. You should be prepared to take the makeup test/quiz the day you return to class.

**HOMEWORK POLICY**

1. Late homeworks will receive 50% credit. A maximum of 85% credit can be earned on COMPLETED late assignments if TWO Low Jugs are completed for the assignment in question. This can be completed for each late assignment.
2. Homework assignments are due immediately at the beginning of class.

**GRADE ALLOCATION:**

1. Personal Points 5% (Exemplary participation and behavior on individual tasks and in cooperative work groups)
2. Labs 15%
3. Homework Notebook 25%
4. Quizzes 15%,
5. Tests 30%
6. Final Exam 10%

**GRADING SCALE (all numbers are percentage values)**

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

# Loyola High School

## Lab Safety Guidelines

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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!**

# **Loyola High School Academic Integrity Statement**

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“Loyola is a community dedicated to academic excellence, student-centered education, and the Jesuit tradition. As such, the school expects all members of its community to act with honesty and integrity at all times, especially in their academic work. Academic honesty respects the intellectual and creative work of others, flows from dedication to and pride in performing one’s own best work, and is essential if true learning is to take place.”

# Personal Point Agreement

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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:

1. BE A NICE GUY – Do NOT disrupt class (not taking notes, talking during lectures, horseplaying in lab, eating/drinking in class or lab\*\*, inappropriate language, etc.)
2. BE A GOOD STUDENT – Raise your hand before speaking in class, bring all class supplies to class (book, notebooks, pencil, pen, calculator), bubble in name on scantrons for tests and quizzes, use electronic devices for physics purposes only. Students should use the bathroom during the allotted breaks\*.
3. BE A NEAT PERSON – Pick up any new/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.

**Please sign below after you have read the “Loyola High School Lab Safety Guidelines”, Loyola High School Academic Integrity Statement”, and the “Personal Point Agreement.”**

**Student’s name (printed):** \_\_\_\_\_

**Student’s name (signed):** \_\_\_\_\_

**Parent’s name (printed):** \_\_\_\_\_

**Parent’s name (signed):** \_\_\_\_\_

**Date:** \_\_\_\_\_