

AP Physics Mechanics

Course Outline

Michael Lew

TEXT: Fundamentals of Physics
Halliday, Resnick, and Walker
8th Edition

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COURSE OVERVIEW: This college level, calculus-based Physics course will cover Chapters 1-16 of the book. The course is focus about 2 major lab projects, 13 mini-labs, lab reports, and written homework. Students are expected to have mastered the basic concepts of elementary algebra, geometry, and trigonometry. This section of AP Physics is accelerated and will cover all topics in a great amount of depth. In addition, this course will be taught using an inquiry-based model based on Physics educational research from the University of Washington (PERS Research Group), University of Oregon (Solokoff), Harvard University (Mazur), and Arizona State University (Jackson).

COURSE OBJECTIVES:

1. To master the fundamental concepts of physics (mass, velocity, acceleration, inertia, momentum, gravitation. etc.) and how they relate to the world around us.
2. To apply the scientific method in solving physics problems and gain insight into solving other types of problems.
3. To exercise and refine analytical problem solving skills.
4. To be able to use an electronic spreadsheet (Microsoft Excel) to solve various problems related to Physics.

SUPPLIES NEEDED:

1. Physics Book
2. Scientific Calculator
3. TWO **SPIRAL** graph paper notebooks
4. Pencil
5. 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.

HOMWORK 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 prior to be taped into notebook.
5. Homework notebooks are due immediately at the beginning of class. There should be no last minute work being done (i.e. highlighting problem numbers, taping in plots, etc.). These homeworks will be considered late and will receive 1/2 credit.

HOMWORK FORMAT:

1. Pencil only
2. Highlight problem numbers
3. Units on all FINAL answers
4. Box Answers
5. Tape in TRIMMED Excel plots
6. Excel plots should face same direction when taped in notebook (see example in class)
7. USE SPIRAL GRAPH PAPER NOTEBOOK ONLY!!

Any violation of any of these above rules will result in a 25% deduction of points for that homework assignment.

GRADE ALLOCATION:

Personal Points	5%
Prelabs	5%
Labs	20%
Homework	25%
Quizzes	15%
Tests	30%

SENIOR PROEJCT MEETINGS:

There will be NO on-campus meetings during the month of January during the Senior Project, although there will be a long term project-based assignment assigned during this time.

GRADING SCALE (all numbers are in percent):

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

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.

AMDG

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!

Mutual Contract

Advanced Placement Physics

As a student in "AP Physics C Mechanics", I, _____, will complete **ALL** assignments required in a manner worthy of an Advanced Placement student. I will participate in class discussions and lessons to increase my working knowledge and understanding of the basic principles of Physics. I will study for exams and quizzes to the best of my ability and to the expectations of the instructor. I will not hesitate to seek assistance from the instructor.

Having enrolled in this course, I also agree to take the Advanced Placement in Physics C Mechanics Exam in May 2013.

I, **Michael Lew**, instructor of the Advanced Placement Physics C Mechanics/Electricity and Magnetism course, will present the material in a clear and challenging manner. I will be clear, innovative, demanding, helpful, and available for assistance. I will conduct class in a manner which guides students to higher levels of thinking and critical thought. It is my goal to help students achieve passing scores on the AP Physics C exam.

Student Name: _____

Student Signature: _____

Date: _____

Teacher Signature: _____

AP 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 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.

Name: (print) _____

Name: (sign) _____

Date: _____