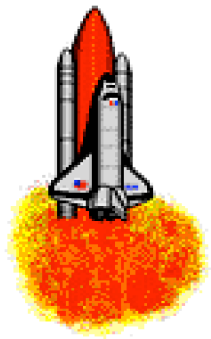
Cypress College

PHYS221 General Physics

Spring 2008

Section

20942. Lecture: TTh 11-12:20 PM. Lab: T 1-3:50 PM, SEM-112.



Instructor: ***Dr. Ron Armale***

Office

SEM-259, **Phone**: (714) 484-7000 Ext. 48638.
Science/Math Division: (714) 484-7153. FAX: (714) 952-9667.

Email

RArmale@CypressCollege.edu is the best way to reach me. Always put course number/title in the Subject field. Sign your Email with your full name. I check Email Monday-Friday and will reply to you within 24 hours.
Web: http://sem.CypressCollege.edu/~astronomy

Office hours

Monday and Thursday 1-3PM, or by appointment.

Course Description

PHYS 221 C GENERAL PHYSICS
4 Units Three hours lecture and Three hours laboratory per week.
UC Credit Limitation/CSU, AA GE, CSU GE, IGETC, CAN PHYS 8
Prerequisite: PHYS 130 C with a minimum grade of "C" (or high school physics with a minimum grade of "B") and MATH 150AC, with a minimum grade of "C"; and completion of or concurrent enrollment in MATH 150BC. Advisory: Recommended background PHYS 201 C and either ENGR 110 C or ENGT 110 C.
This is the first course of a three-semester introductory physics program for students majoring in physics, chemistry, geology, engineering (all areas), mathematics and other related fields. Topics studied include mechanics, oscillations, properties of matter, and fluids. Problems and derivations require knowledge of differential and integral calculus.

Required Texts

1) *Physics for Scientists and Engineers*, 7th edition by Serway and Jewett.

Optional supplements

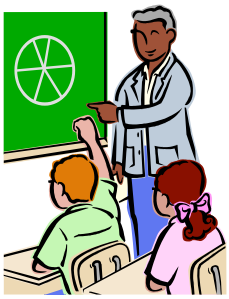
1. *Student Solutions Manual and Study Guide*, by Gordon and McGrew.

2. *Experimentation,* by Baird.

All above books are available in the reserve desk of the library.
Note: You may purchase your paper textbooks online from the Cypress College
Online Bookstore at http://www.cypresscollegebookstore.com/
You may buy the online book: http://www.aw-bc.com/chaisson/

Supplies

Graph paper, scientific calculator, ruler, protractor, and computer access (available on campus at the Math Lab SEM-114).



Ground Rules

- **Attend all classes**. It will influence your grade in borderline cases. If you miss more than **6** lectures or **2** labs, you may be dropped. If the drop date has passed you will receive an F grade. Note that It is **your responsibility** to officially drop the course if you want to withdraw.
- **Be on time**. Tardiness and leaving early are rude and disruptive. If you are late, be as quiet as possible.
- **Respect your teacher and classmates**. Go outside to talk.
- **Eat and drink before or after class.**
- **Turn off phones and pagers before you enter the classroom.**
- **Be honest**. Cheating in any form will not be tolerated. Copying from your lab partners is cheating. If caught, you will fail the course.
- **Work hard**. Plan to spend at least **8** hours of out-of-class study per week.

Grading Policy

Lab reports	20%	A normal distribution (**curve**) will be	A =90-100%
Quizzes	20%	used, which usually results in	B =80-89%
Midterm exams	40%	**approximately** the following grade	C = 70-79%
Final exam	20%	distribution:	D = 60-69%
			F = 0-59%

Homework

1) READING ASSIGNMENTS: The textbook and study guide will be your primary resource for learning physics. The lectures are intended to supplement the textbook and reinforce your understanding. So, this means that you do have to read the book! So prepare before each lecture by reading the assigned sections of the textbook. Note down any questions which occur during your reading. Ask the questions either in class or during office hours.
2) Can you learn how to swim without getting wet? Can you learn physics without solving problems? No to both questions. So about 20 questions and problems are

assigned from each chapter. The homework will not be collected or graded. However, doing the problems *yourself* is the best way to do well on the tests.

Collaboration

To succeed you must attempt all the problems yourself. I suggest that you work in small groups (2-3). Once a solution is reached, write the answer in your own words. To simply copy the group answer or study the solutions will not help you when you have to swim on your own during exams. **Copying from your lab partners is cheating.**

Quizzes

A 20 minute quiz is given every week at the beginning of lab. The quiz will cover the material from the previous week, as well as earlier related topics. The quiz will include multiple choice questions, short and long problems. The quiz is based on, but is not identical to the homework Quizzes are open textbook (no notes) and you may use a calculator. The lowest quiz score may be dropped, and make-ups will not be given.

Exams

Three 2-hour midterm exams and one 2-hour final exam are given. They are closed book, but you may bring **one** formula sheet (8.5x11, one side) and a calculator. The exams will include multiple choice questions, short and long problems. Bring a Bluebook (8.5x11 size). Make-ups are considered in cases of documented and verified emergencies only (you must call my office on the exam day).

Upon completion of the course, the student will be able to:

1. Clearly present written analysis of physics problems, including explanation of the approach, and application of appropriate principles and laws of physics and mathematics (including calculus and vector analysis) leading to the solution.
2. Participate effectively as a member of a lab team which conducts successful physics experiments.
3. Prepare a satisfactory written report of a physics experiment which includes:
   o Synthesis and mathematical analysis of data to obtain a measurement of a physical quantity or to verify a physical law; including analysis of errors, and
   o Thorough discussion and assessment of the result.
4. Apply Newton's laws of motion to analyze and solve problems involving phenomena such as static equilibrium of a solid body, translational motion, collisions, circular motion, and rotation of solid body.
5. Apply the Work-Energy Theorem to analyze and solve problems involving mechanical energy and power.

6. Understand and apply the laws of conservation of momentum, energy, and angular momentum to analyze problems involving collisions, energy transfer, and rotation in systems of solid bodies.
7. Recognize mechanical systems which exhibit simple harmonic motion and discuss their behavior qualitatively and quantitatively.
8. Comprehend Newton's Law of Gravitation and use it to analyze phenomena involving simple gravitational interaction and satellite motion.
9. Understand Archimedes' principle and Bernoulli's equation.

PHYS 221 GENERAL PHYSICS Calendar - Spring 2008

Wk	Dates	Ch	Topics	Experiment
1	Jan14-18	1	Physics and Measurement **Holiday: Mon Jan 21 King**	Lecture Ch 1
2	22-25	2	Motion in One Dimension	Error Analysis
3	29-Feb1	3,4	Vectors	Force Table
4	4-8	4	Motion in Two Dimensions	Graphing 1
5	Feb11-14	5	Laws of motion **Holiday: Mon Feb 18 Pres**	**Exam 1 Ch 1-4**
6	Feb19-22	5	Laws of motion	Graphing 2
7	25-29	6	Circular Motion. Study 4.4-4.5,	Free Fall
8	Mar3-7	7	Energy and Energy Transfer	Jump
9	Mar10-14 Mar17-21	8	Potential Energy **Spring Recess**	**Exam 2 Ch 4-7**
10	Mar24-28	9	Linear Momentum and Collisions	Friction
11	31-Apr4	10	Rotation about a fixed axis-10.1-5	Centripetal Force
12	Apr7-11	10	Torque & Rolling Motion-10.6-10.9	Ballistic pendulum
13	Apr14-18	11	Angular momentum	**Exam 3 Ch 7-10**
14	21-25	13	Universal Gravitation	Moment of inertia
15	28-May2	14	Fluid Mechanics	Angular Momentum
16	May 5-9	15	Oscillatory Motion	Archimedes' Principle
17	12-14		Review-Final Exams start May 14	Review
18	19-23		Final Exams	

Exam dates are approximate.

Final Exam (comprehensive Ch 1-15): Tuesday May 20, 10:30-12:30 PM.

To succeed in a physics course

- **Read the book** before class, take notes and write down questions as you read.
- **Ask questions** in class and at office hours and ask your classmates.
- **Take notes** in class. I will write your exams not your textbook authors.

- **Attempt all homework** problems yourself. If you get stuck, don't give up and assume you can skip this topic. Physics builds on previous material, so ask for help.
- **Collaborate** with classmates on homework and exam preparation.
- **Explain** difficult concepts to others. "If you can't explain it to your grandmother, then you really don't understand it." - Richard Feynman.
- Make use of the Math lab, computer lab, and the Tutoring Center.
- If you have special needs, I'll do my best to accommodate you.

Communication

Email Etiquette

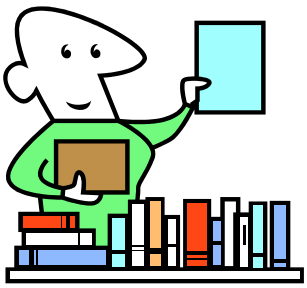
Email is an important communication tool for academic success. It indicates whether you are a serious student or not. Appropriate uses of email include informal questions, requests for clarification addressed to your instructor or to your classmates. To maximize the benefits, limit your email to course related subjects. Check the Syllabus, Announcements, and FAQ sections on Blackboard for answers to the most common questions.

How to Email

Your instructor's email software is set to filter junk mail. To make sure your email is received, follow these guidelines: Always sign your emails with your entire name since your address may not adequately identify you. In the "subject" or "re" area please put your course name then the subject of your message. For example: "ASTR116: Homework question." Use formal grammar, spelling, and punctuation. Do not use internet or text messaging abbreviations such as "lol."

Check out these web sites for more information on how to write college level emails:

1. Introduction to Electronic Mail Available: http://www.albion.com/netiquette/book/0963702513p47.html
2. E-mailing, like, whatever to profs: http://writing.upenn.edu/news/dp_email.html
3. Email etiquette in an instant messaging world: http://www.doit.wisc.edu/news/story.asp?filename=791



Get more help at the Library (LLRC)

Math Lab-127 Tutoring Center. Writing Center.
Textbook web site: www.serwayphysics.com

Strongly Recommended: Enroll in PHYS 23 PHYS 221 Problem Solving Th 5-6:10 PM in SEM-112, 1 unit, Credit/No Credit, Grading based on attendance. Starts the 4th week of the semester.

Student Privacy

Your grades are considered private and will not be displayed with any identifying information to you. With your permission, I may post your grade using the last 4 digits of your Cypress College ID number. All of your personal information such as Email address are private and will not be shared with anyone other than Cypress College staff who have the right to view this information. All information you post in the Discussion Board area are NOT private and may be read by other students who are enrolled in this class.

Student Services

Quick Reference to Cypress College Services
http://www.cypresscollege.edu/counseling.php

Student Services Home Page
http://www.cypresscollege.edu/studentservices.php

Cypress College Computer Labs Home Page
http://www.cypresscollege.edu/instructionalservices.php
District Issued Photo ID required at all labs!

LLRC – Library Learning Resource Center
(Library building East of the pond)
PCs with word processing, internet access, instructional software, and free tutoring. Elevator access is available from the ground floor. The closest parking lots are Lot 5 and Lot 7.
If you are a student of Cypress College, you need your photo ID to check out materials from the Library. Your Cypress College photo ID also provides library privileges at Fullerton College, Golden West College, Orange Coast College, Cal. State Long Beach and Cal. State Fullerton libraries.
Phone: 714 484 7193
Cypress College Library Home Page
http://www.cypresscollege.edu/~library/

See your Counselor

Academic Advising/Counseling Services
http://www.cypresscollege.edu/counseling.php

As a student, you are assigned to a counselor based on the major you indicated on your application to Cypress College. If you indicate "General Studies" or "undecided" you are assigned to a counselor on a random basis.

How to See a Counselor
http://www.cypresscollege.edu/counseling.php?page=1

Counselors Offices, Telephone Numbers, Email Addresses
http://www.cypresscollege.edu/counseling.php?page=13

Online Counselor

During Registration periods, you can contact an online advisor at onlinecounselor@cypresscollege.edu.

Student Grievances

Students are advised to always try to resolve the matter with the instructor first. You may also wish to consult with your counselor. If these preliminary steps do not help, you may wish to discuss the problem with the Department Chair. If the problem is still unresolved, you may consult with the Division Dean. To pursue the issue further, you may file an appeal with the Campus Petitions Committee. Please see your counselor for assistance.

Distance Education Frequently Asked Questions
http://www.cypresscollege.edu/~online/index.php?page=6

Students with Disabilities

If you anticipate issues related to the format or requirements of this course, please meet with me. I would like us to discuss ways to ensure your full participation in the course. If you determine that formal, disability-related accommodations are necessary, it is very important that you be registered with DSPS (714 484 7104) and notify me of your eligibility for reasonable accommodations. We can then plan how best to coordinate your accommodations. (Adapted from University of Arizona: http://drc.arizona.edu/teach/syllabus-statement.html)

Physics 221 General Physics Laboratory

Why experiment?

No scientific principle is accepted unless it has passed rigorous experimental tests. These ten or so experiments you will perform, will provide you with physical evidence that the principles you learn in lecture are not some scientist's opinions.

Ground Rules

- Read the experiment before you come to class, and arrive on time.
- The three hour laboratory is an essential part of the course, so attendance will be taken and if you are absent, you cannot turn in a lab report using someone else's data.

- You will be penalized for arriving late.
- Lab reports are due at the beginning of class on Thursday, nine days after the experiment is performed.
- Late reports are penalized 2 point if turned in the same day by 3 PM, and 4 points each additional day.
- If you miss more than **two** reports, you may not pass the course.
- No make-up labs will be given, but you may make up **one** missed lab with **instructor permission**. You will use partners' data and turn it in on time.

During lab

- Turn off your cell phone before the start of class.
- Collaborate on all parts of the experiment. However, you are not supposed to divide the labor among your partners.
- Always check your partners' work since you will use whatever data they gather.
- You will collect the data and perform the calculations in **class writing all text and numbers in ink (black is preferred, blue is accepted, do not use other colors**.). **Use pencil to draw graphs by hand.**
- You must write the data in the lab manual, notebook paper is not acceptable. I will initial your individual data sheets before you leave. Lab reports submitted without an original initialed data sheet are not accepted.

- **Some equipment is hazardous, so safety will always be emphasized.**
- **Eating or drinking are NOT allowed in the classroom.**
- **Before you leave, you must clean-up your area and neatly put all the equipment back on the carts.**

- Outside of lab, you will **type your own report in your own words**.
- Copying your partner's answers is cheating.

Format Guidelines

Your report **must** follow the following formats:

1. Typed using a clear dark standard font: 12-14 point, double space, Do not use fancy, artistic, or calligraphic fonts. One inch margins on all sides, and number all pages sequentially using Arabic numerals: 1 2 3 ..... Staple your report in the upper left corner. Use white paper only on one side. All sections must be typed except for original data, calculations, and numerical questions. You may use pencil for graphing, but data, calculations done at home, and numerical questions must be done in ink.
2. The report should be clear, concise, and concrete. **Neatness counts!** Include enough **white space** between clearly titled sections. Always use titles for the sections outlined below.
3. Check your spelling, grammar, and punctuation.

4. All figures must have a title and caption that is understandable independent of the report. They should be numbered sequentially, e.g. Graph 1, Figure 3, Table 2.

Lab Grading Policy

The reports are graded based on (1) format, and (2) content. A report is given a grade of 40 points if it is perfect. That is if you (1) follow the above guidelines, and (2) you understand the experiment and results. The *Advance Study Assignment* in your lab manual is worth 10 points and is due at the **beginning** of the period. It must be filled out in black ink. I will check it during lab and return it to you so you may include it in your lab report.

How to write lab reports

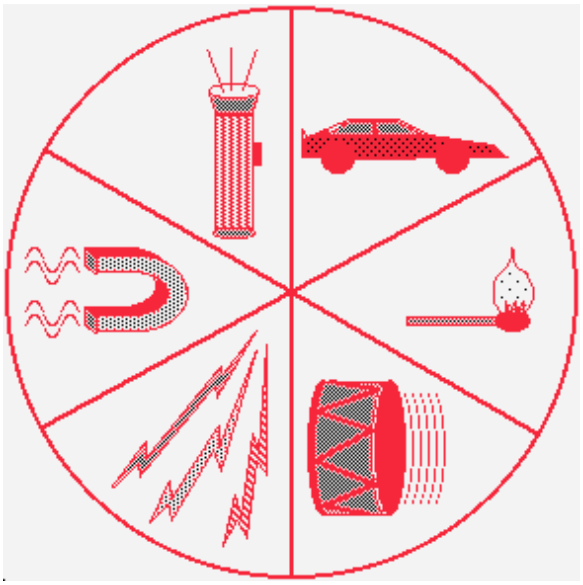
Lab reports must be prepared on a word processor and should include the following sections:

Cover sheet in this order:

- Group (table) number
- Your name
- Experiment title
- Date report is due
- All partners' names.

Use a large font size > 20 point for cover sheet

1. **Advance Study Assignment (Prelab)** should be filled out in black ink and initialed by your instructor. (due before the lab is performed). Must have instructor initials.
2. **Objectives of the experiment** in your own words, what physical principle are you investigating? (1-2 sentences).
3. **Summary** of the experiment. The **Summary** should include what you did in lab, what apparatus you used, what calculations you performed, what graphs you plotted, and what results you obtained using words not numbers. This is not a procedures section. Do not list data, and do not explain the results here (2-3 sentences, this section should be short.)
4. **Original data** sheets initialed by me. Your lab manual pages must be used. **You will get a grade of zero without these**.



Optional: If your original data sheets are messy, you may type the data in tables or rewrite them in black ink using the **identical** format of your lab manual**. Put the rewritten data before the Original sheets that are initialed by your instructor which you must always include.**

Graphs and Sample calculation **in the order you did them**, that is if you did the graph first then the calculations, present them in that order.

5. **Graphs** of data:
   a. All graphs should have a title, and should be done on graph paper or using software.
   b. Axes should be clearly labeled with units and scale.
   c. Interpret the graph. What can you infer from its shape or slope? Write this result **on the graph** in a box at a clear corner or blank space.
6. Sample **calculations** (one for each type of calculation.) using original lab manual pages. Do the work on scratch paper first, then neatly print in ink in your lab manual pages. If you need more room, you may use a separate sheet for calculations. If you get large errors (>10%), then show ALL calculation steps.

7. **Table of Results**. Give the final results only, include the accepted values and percentage errors. Include units. Do not explain the results, just list them. Must be in the form of a typed table. Use the *Insert Table* command in *Word* or *Word Perfect*.

8. **Error Analysis**. Always start with the phrase: the biggest source of error in this experiment is 1… . Then continue the list of other sources of error: 2, 3, 4… . Start a new line for each error. Discuss sources of error, how they may be avoided, and how they affect your results. Discuss how good your results are considering error propagation. Explain poor results. Show a sample error propagation calculation if required.

9. **Conclusions**
   a. What principle or physical law of nature did you investigate?
   b. What did you learn?
   This is the most important section. (one or two short paragraphs)
   Do not restate how you did the experiment. Review the Objectives section before you write the Conclusions.

10. **Questions.** Typed answers to assigned questions. **Always explain, show work, and draw a diagram.** Type all word answers. **You may hand print in ink** any mathematical solutions. You need not type the questions. Clearly number each answer and include several blank lines between them. **BOX** or underline answers.

No plagiarism: copying any part of the report from your lab partners or letting them copy from you is cheating. All involved students will get a zero for that assignment.