

Syllabus
Physics 1090, Fundamentals of the Physical Universe
University of Wyoming, Fall Semester 2009

Instructor

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Office Hours: Monday 10 AM–noon, Wednesday noon–2 PM

Objectives

The successful student will:

- Interpret everyday and experimental phenomena in terms of standard scientific theory.
- Communicate and discuss scientific explanations, interpretations, and uncertainties.
- Answer questions about the properties and interactions of matter by designing, performing, and interpreting experiments.

Course Content and Approach

How does the world work? What is it made of? The secrets of the universe are the focus of PHYS 1090. The course is a one-semester overview of physical science for students who plan to become elementary school teachers. It addresses the main domains of classical physics: mechanics, thermodynamics, and electromagnetism; and the fundamental concepts of chemistry: bonding, structure, and reactions. The emphasis is on recognizing physical principles at work in the everyday world, communicating your understandings to others, and using experiments and observation to deepen your understanding.

Required Materials

Textbooks: *The Cartoon Guide to Physics*, by Larry Gonick and Art Huffman, and *The Cartoon Guide to Chemistry*, by Larry Gonick and Craig Criddle, both published by HarperCollins. Available at the University Bookstore for \$17.95 and \$17.00, respectively.

Course Pack: *PHYS 1090 Activities Manual*, available at the bookstore for \$19.50.

Grading

The final grade is determined from cumulative points attained. Grading is on a standard scale (90's = A, 80's = B, 70's = C, 60's = D, < 60% = F).

A total of 1000 points will be available in the course. They are apportioned as follows:

item	number	points/ea	points
Weekly units	14	50	700
Labors	3	100	300

A note about grades: Your grade in this course reflects only your performance over a 15-week period on a limited set of evaluations. Your grade does not reflect your worth as a person or what I think of you. Because of the limited scope of this course, your grade is not a prediction of your future success or even an evaluation of your potential as a teacher. In short, do not cause yourself (or your instructor) anxiety by making more of your grade than it really is.

Course Components

Lecture/Lab

Monday, Wednesday and Friday: 3:10–5:00 PM, Physical Science Building, rooms 237–239. Lectures and laboratory activities are integrated in the three weekly class meetings. There is no grade for attendance, but points earned in class cannot be made up without a University excuse or prior instructor consent.

Class activities are your primary opportunity to learn the class material. Most of the class activities are activities designed to be done by groups of four students. There is no grade for participation, and students are not assigned group roles. Collaborating in group work is expected and encouraged because working and discussing with other students helps you develop your scientific reasoning and communication. You really will learn more by devoting your attention to the activity. Trust me on this, and don't learn it the hard way.

Each unit is partly assessed by group interviews, in which each group will be asked four interview questions, selected from the activities manual. All group members receive ten (10) points if three or four of the questions are answered correctly, five (5) points if two are answered correctly, and zero (0) points if one or fewer questions are answered correctly.

Drills and Homework

Most units conclude with an on-line drill and written homework assignment. These reinforce the concepts explored in the activities and discussion. Unless otherwise specified, weekly homework questions require hard copy written answers.

Labors

There are three labors during the semester, each worth one hundred (100) points. These focus on developing skills beyond what is addressed in the weekly activities. Each labor is described in detail in its own document.

Textbooks

The textbooks are a resource for you to help yourself fulfill the course objectives. Textbook readings complement the material presented in class by providing a different approach and addressing additional information. Guides for all readings are posted on the class web site. Reading the corresponding text before a class meeting is recommended.

Internet

Course information is posted on the class web site at <http://www.barransclass.com/phys1090>. Drills are accessed and submitted through Sakai.

Absences

Anticipated absences should be brought to my attention before they occur. Work missed due to an absence may be made up if the student has an official University excuse or at my discretion. If a justified makeup is not possible due to schedule or equipment constraints, the missed work may be prorated.

Late Work

Absent prior arrangements or unforeseen crises, work turned in after its due date is assessed a penalty of 10% for each calendar day that it is late. Drills on Sakai cannot be submitted late.

Student Conduct

This class exists to help students learn physics and chemistry. Students are expected to conduct themselves in class in accordance with this goal. Those who disrupt the class or interfere with other students' opportunity to learn will be asked to leave. Students are expected to respect others' opinions and abilities, and to help each other during group work activities. If you have a cell phone, leave it home, or turn it off and keep it out of sight. Words cannot convey my displeasure at students text-messaging in class.

Academic Expectations

If you find yourself struggling, please see me for help sooner rather than later. I will do whatever I can to help you succeed.

Students are expected to work together on group work. Individual work, such as labors, must be solely the work of each student. All ideas from others that appear in writings and presentations submitted in this class must be properly attributed. Consult me or the specific assignment for the appropriate attribution format.

Academic dishonesty is forbidden and will be dealt with according to University procedures. Academic dishonesty primarily involves a student misrepresenting work submitted in the class or assisting another student submit misrepresented work. This includes, but is not limited to, signing an absent student's name to a group work sheet; "dry-labbing" or recording data that you did not actually observe; submitting material for grading that is, was, or will be also submitted to another class; and submitting material written by another without proper attribution. A comprehensive description of academic dishonesty can be found at http://www.uwyo.edu/generalcounsel/support/UniRegs/802_rev3.doc.

Office Hours

During my listed office hours, I will be either physically in my office, or I will leave a note on my desk stating where I can be found nearby (lab, department office...). You are also welcome to see me in my office any other time that I am there—if my office door is open, come on in.

Contacting Me

You are welcome to visit me in my office as described above. Otherwise, the very best way to contact me is by e-mail. I can pretty much guarantee that I will forget any conversation in class.

If I have my wits about me when you speak to me in class, I will ask you to send me an e-mail to remind me of what we discussed. If I forget to tell you to send the e-mail, please send the e-mail anyway.

The hour immediately before class is not a good time to contact me, because I will be concentrating on preparing for class. After class is usually better, unless I am in a hurry to clean up before the scheduled end of class.

Finally, I am not permitted to discuss your grades by telephone or e-mail, so please do not ask!

Special Accommodations

If you have a physical, learning, or psychological disability and require accommodations, please let me know as soon as possible. You will need to register with, and provide documentation of your disability to, University Disability Support Services (UDSS) in SEO, room 330 Knight Hall, 766-6189, TTY: 766-3073, udss@uwyo.edu. Please discuss any special needs you may have with me as well.

University Studies Program Statement

This course fulfills the Physical Science (SP) component of the 2003 University Studies Program. SP courses include basic and applied study of interactions that govern all physical and chemical phenomena. They emphasize the laws of motion, the relationships of space, time, mass and energy, electromagnetic radiation, macroscopic and microscopic views of matter, chemical transformation, and quantum principles. They introduce the scientific approach, its scope and limitations. They provide a term-long laboratory experience (or equivalent substantial experimental work integrated with the lecture).

Disclaimer

Information in the syllabus was, to the best knowledge of the instructor, correct when distributed at the beginning of the term. The instructor, however, reserves the right, acting within the policies and procedures of the University of Wyoming, to make changes in the course content or instructional techniques during the term without notice or obligation. If any changes to the syllabus become necessary, students will be notified in class and on the class web site.

Typical Weekly Plan

Most of the units begin with laboratory activities on Monday. Labs may continue to Wednesday or Friday. Class discussion and lecture, and group interviews on Friday complete the unit.

Additional activities, such as in-class work on labors, will usually be on Wednesdays or Fridays.

Tentative Unit Schedule

Dates	Unit	Reading
Aug 24	1. Science as a Way of Learning	P Ch. 1
Aug 26, 28, 31	2. Newton's First and Second Laws	P Ch. 2
Sep 2, 4, 9, 11	3. Momentum and Energy	P Ch. 6–10
Sep 14, 16, 18	4. Fluids	C ch.6
Sep 21, 23, 25	5. Heat and Temperature	C Ch. 5, 6, 10
Sep 28, 30, Oct 2	6. Electricity and Magnetism	P Ch. 12, 13, 15, 17, 18
Oct 5, 7, 9	7. Waves and Sound	none
Oct 12, 14, 16	8. Light and Optics	none
Oct 19, 21, 23	9. Nuclei and Atoms	C Ch. 1, 2
Oct 26, 28	10. Physical Changes and Mixtures	C Ch. 7
Oct 30	Labor 2 Presentations	
Nov 2, 4, 6	11. Chemical Bonding	C Ch. 3
Nov 9, 11, 13	12. Reaction Heat and Equilibrium	C Ch. 4, 5, 8
Nov 16, 18	13a. Acids and Bases	C Ch. 9
Nov 20, 23	13b. Oxidation and Reduction	C Ch. 4, 11
Nov 25–27	Thanksgiving Break	
Nov 30, Dec 2, 4	14. Organic Compounds	C Ch. 12
Dec 9	Final: Labor 3 Presentations, 3:30–5:30 PM	

Reading texts: P = Gonick and Huffman, *The Cartoon Guide to Physics*; C = Gonick and Criddle, *The Cartoon Guide to Chemistry*.