

CHEM/PHYS 150 – ELEMENTARY CONCEPTS IN PHYSICS & CHEMISTRY

Syllabus and Course Information Sheet – Spring 2009

Colorado State University – Pueblo

Professor: Dr. Jeff Piquette

Office: T 269

Office Hours: T 3:30-4:00, W 10-noon, Th 11-1 &
3:30-4:00, F 10-11, or by appt.

Prerequisites: None

Meeting Times: T, Th 1:00 p.m. – 3:20 p.m.

Phone: 719-549-2825

Email: jeff.piquette@colostate-pueblo.edu

Course Website: blackboard.colostate-pueblo.edu

Credit Hours: 4

Co-requisite: None

Classroom: PM 126 (T), 121 (Th) (this will change)

Required Materials: Tillery, Bill W. *Physical Science*, 8th ed., McGraw-Hill, 2009.
Scientific calculator (cell phones may not be used)

Nature of the Course: This course provides students with some elementary concepts in chemistry and physics. It will be conducted in an integrated lecture-laboratory format and will be highly related to the current culture of standards-based science education. The material will be investigated in a way that tries to relate it to students' lives and make it as applicable as possible. By the end of the course, students should be able to:

- Recognize and apply basic principles of physics and chemistry.
- Communicate and explain basic principles of physics and chemistry.
- Solve simple numerical problems concerning basic physics and chemistry.

Your commitment: You should plan on spending approximately 2-3 hours in study, homework problems, and research for each hour of class time. This is just an estimate. The amount of time spent working outside of class will vary depending on your background. You have to decide to devote the necessary time to succeed. I will do what I can to help you all be successful, but it is ultimately up to you to do what is required to master the material. Traditionally, students struggle with the mathematics that is needed to solve some of the problems we will encounter. Be sure to see me as soon as possible if your algebra or other math skills need some brushing up. *I will be using Blackboard to supplement the course. It is your responsibility to check Blackboard daily for updates about the course.*

Tentative Course Schedule – All labs will be announced in class

Week of	Chapter: Topic	Evaluation
Jan 12	Intro. & Ch. 1: What is Science Jan 16 – End of Add Period	
Jan 19	Ch. 2: Motion	
Jan 26	Ch. 3: Energy Jan 26 – End of Drop Period	
Feb 2	Ch. 4: Heat & Temperature	
Feb 9	Catch up	Exam I (Ch. 1-4)
Feb 16	Ch. 5: Wave Motions & Sound	
Feb 23	Ch. 6: Electricity	
Mar 2	Ch. 7: Light	
Mar 9	Catch up Mar 13 – Last day to drop with a W	Exam II (Ch. 5-7)
Mar 16	Ch. 8: Atoms & Periodic Properties	
Mar 23	Spring Break	
Mar 30	Ch. 9: Chemical Bonds	
Apr 6	Ch. 10: Chemical Reactions	
Apr 13	Ch. 11: Water & Solutions	
Apr 20	Special Topics, Catch up, and Review	Exam III (Ch. 8-11)
Apr 30	Comprehensive Final Exam, 1:00—3:20pm	

Grading:	Exams I-III, Final	45% (10%, 15%)	> 90% = A
	Quizzes/Homework	40%	80-89% = B
	Lab Reports	10%	70-79% = C
	Class Participation	<u>5%</u>	60-69% = D
	Total:	100%	< 60% = F

Exams: Exams will be administered approximately one week after the completion of each section of material. For example, once chapters 1-4 have been completed, an exam will be scheduled for a week after that time. Please see the note below in the Attendance section regarding missed/makeup work.

Quizzes: Daily quizzes/activities will be given to help prepare you for exams. They will be short and easy to grade. I will discuss the particulars of these quizzes/activities and how they are graded during the first class session. If you miss the first class session, see me ASAP so I can describe my system to you.

Homework: There is no regular set of homework due for this class. Homework will be assigned at the discretion of the instructor, based on class participation and performance. **You should follow what is posted in Blackboard (under Assignments) for homework expectations and due dates.** I like to assign fun, unique, and interesting homework assignments – especially involving writing. It is important for you to learn how to write effectively – even in a chemistry and physics class! **Late assignments will be reduced 20% for each school day late.** I encourage you to submit your assignments electronically!

Attendance: You are expected to attend all classes and to be on time. You are responsible for all course material discussed, laboratory exercises performed, and special announcements made during class – even if you were late or absent. If you must miss a class, contact me beforehand. If you fail to do so and miss a lab exercise, homework assignment, or exam, no makeup will be permitted without an acceptable, **documented** excuse. These cases will be dealt with on an individual basis. More information related to this is in the section on Participation.

Lab Reports: All lab reports must be typed (double-spaced with at least 1 inch margins). If you do not follow these guidelines, I will return the lab to you and count it late until you correct it. I will grade the reports primarily on content, but grammar, spelling, etc. will be included – especially for the discussion section. The format of the lab reports is given below and you will find a sample lab report that I have prepared in Blackboard.

- I. **Title**—An appropriate title. Be sure to include your name!
- II. **Abstract**—A short summary of the experiment (but not detailed procedure), why it was performed and the most important results that were obtained.
- III. **Introduction**—This section gives the necessary background information about and the rationale for the experiment. This might include such things as the theory behind the experiment, the formulas or balanced chemical equations used, etc. Basically make sure the reader knows the context and purpose of the experiment.
- IV. **Safety**— Any precautions necessary for the specific activities for a given lab.
- V. **Procedure**—Refer to the appropriate handout, etc. and document any deviations from the procedure. **You do not need to copy the entire procedure!** However, the reader should be able to duplicate *exactly* what you did!
- VI. **Data & Calculations**—This section should include all calculations, tables, descriptions, etc. concerning the work you did in the experiment. One table that I expect for almost every lab is the equipment/reagent table. This is a tabulation of all **important** equipment and reagents used in the experiment.
- VII. **Discussion/Conclusions**—In this section, you are pulling everything together to give the reader the “take-home” messages from the lab. I want this section to follow this format: 1) directly re-state the objective(s), 2) state whether or not you met the objectives, 3) give supporting evidence as to why you either met or did not meet the objectives, 4) discuss any errors that were made, 5) offer suggestions to improve the lab if you had to run it again, 6) discuss any other interesting aspects of the lab (such as new skills or concepts you learned outside the realm of the objectives, any discrepancies you found compared to expected or

accepted results, etc.), and 7) end with appropriate concluding remarks that summarize the most important messages the reader should take away with them.

- VIII. **References**—Cite any and all sources that you used to create your report. Your textbook is a likely source as well as websites, books, journals, etc. You must follow some style here for your citations. I prefer APA.

Participation: Part of your grade will be based on your participation in class. Therefore, attending class (and being on time) is very important. **If you are late or have unexcused absences, this part of your grade will suffer.** I will also be grading you on how prepared you are for class. This includes both the quantity and quality of your participation, with quality being the more important factor. Use of cell phones in this class is prohibited. If this rule is abused often, I will institute a grade penalty to address it.

CSU-Pueblo TEP Standards: Upon completion of all course activities each student will meet the following benchmarks for teacher education. In addition to the benchmarks listed as student proficiencies, many others will be modeled throughout the course. *Please note that our program standards have been re-aligned and some numbers have changed!*

- 2.4 – (Literacy, K-12/7-12) Supports reading through oral and written language development including:
- 2.4a developing oral English proficiency in students
 - 2.4b developing listening proficiency.
 - 2.4c developing sound writing practices in students including language usage, punctuation, capitalization, and sentence structure.
 - 2.4d developing students' spelling, including spelling strategies that connect to the content area.
 - 2.4e incorporating word processing or other appropriate technology.
 - 2.4f enabling students to write for a variety of purposes, for different audiences, and in multiple genres, including planning, drafting, revising and editing as well as using precise vocabulary and rhetorical devices (figurative language and symbolism)
 - 2.4g supporting writing through relationships among reading, writing, and oral language, including vocabulary development and fluency.
 - 2.4h developing writing proficiency, including ideas and content in writing, various organizational structures of writing, sentence fluency, word choice, and voice appropriate to writing in their content area.
- 2.5 – (Literacy, K-12/7-12) Utilize Colorado Model Content Standards in Reading and Writing for the improvement of instruction.
- 2.6 – (Mathematics) Develops in students an understanding and use of: number systems and number sequences, geometry, measurement, statistics and probability, and functions and use of variables.
- 2.7 – (Mathematics) Utilizes Colorado Model Content Standards in Mathematics for the improvement of instruction.
- 2.8 – (Knowledge of Content) Integrates literacy and mathematics into content area instruction.
- 2.9 – (Knowledge of Content) Enhances content instruction through a thorough understanding of all Colorado model content standards and bases long-term and lesson planning on content standards.
- 2.10 – (Knowledge of Content) Applies expert content knowledge to ensure, enrich and extend learning, including:
- 2.10a Effectively uses multiple representations and explanations of disciplinary concepts that capture key ideas and link them to students' prior understandings.
 - 2.10b Represents and uses differing viewpoints, theories, "ways of knowing" and methods of inquiry in his/her teaching of subject matter content.
 - 2.10c Evaluates teaching resources and curriculum materials for their comprehensiveness, accuracy, and usefulness for representing particular ideas and concepts.
 - 2.10d Engages students in generating knowledge and testing hypotheses according to the methods of inquiry and standards of evidence used in the discipline.
 - 2.10e Develops and uses curricula that encourage students to see, question, and interpret ideas from diverse perspectives.
 - 2.10f Creates interdisciplinary learning experiences that allow inquiry from several subject areas.
- 2.11 – (Knowledge of Content) Is knowledgeable in literacy, math, and all content areas in which he is preparing to teach. For elementary education, content areas include: civics, economics, foreign language, geography, history, science, music, visual arts, and physical education.
- 3.3 – Communicates in ways that demonstrate sensitivity to individual, cultural and gender differences (e.g., appropriate use of eye contact, interpretation of body language and verbal statements, acknowledgement of/responsiveness to different modes of communication and participation).
- 5.4 – Understands the cognitive processes associated with various kinds of learning (e.g., critical and creative thinking, problem structuring and problem solving, invention, memorization and recall) and ensures attention to these learning processes so that students can master content standards.
- 5.7 – Applies technology to the delivery of standards-based instruction.

- 6.3 – Utilizes technology to seek answers to teaching questions.
- 6.5 – Utilizes professional literature, colleagues, professional organizations, and professional development activities to support his/her own development as a learner and a teacher.
- 6.5 – Draws upon professional colleagues within the school and other professional areas as supports for reflection, problem-solving and new ideas, actively sharing experiences and seeking and giving feedback.
- 7.3 – Uses technology to manage and communicate information.
- 7.8 – Participates successfully as a member of a team, sharing, encouraging, and accepting responsibilities.
- 8.1 – Follows the ethical standards of the education profession.
- 8.2 – Consistently exhibits a strong work ethic, assuming responsibility for oneself and others in the learning community; is punctual and on-time for all responsibilities.
- 8.3 – Acts honestly and with integrity at all times in the learning community; demonstrates emotional stability required of professional educators.
- 8.4 – Acts in a caring manner towards K-12 students, peers, and other members of the learning community.
- 8.5 – Advocates teaching as a worthy career and describes various career paths in education, including local, state, national, and international options, higher education, public, and private education.
- 8.5 – Models an excitement for teaching and learning.
- 8.6 – Respects the input of others, including supervisors, and attempts to incorporate feedback to grow professionally.
- 8.7 – Demonstrates flexibility in thinking and behavior; remains open-minded, reserving judgment for evidence.
- 8.8 – Is well-groomed and dresses in a professional manner.
- 8.9 – Speaks, writes, and listens at a professional level.

Words of Wisdom, Advice, & Expectations

1. *Ask questions when you do not understand something.* I am here to help you learn chemistry. That is what I want in this course. Take advantage of my office hours and class time.
2. *Stop me if I am going too fast.* It is important for you to note the issues discussed in class. Those are the ones that will appear on the exams.
3. *Follow closely what is covered in class.* I will try my best to emphasize the important topics during class. Your text covers much more than we will be able to cover in class, so you need to come and hear what I think is important for you to learn. I write the exams – your text doesn't. If a topic is important enough to be discussed in class, then it is of important enough to be included on an exam.
4. *Study for understanding. Don't just "get through" the material.* Too often students read a text just to read the text. They may read it but have no clue what it was they read. When you study, try to achieve a general understanding of the concepts – not a list of memorized facts or simply to "get through" the material. Learning takes time and effort. One hour of focused study is worth much more than 3 hours of mindless reading to get through the chapter, etc.
5. *Form study groups.* A very powerful learning tool is to try to teach a concept to someone else. If you can do that, you probably have a good understanding of that topic. Sharing each other's strengths and ideas is a very good way to learn chemistry.
6. *Feel free to consult with the instructor.* Communication about expectations, requirements, etc. is crucial for your success. Feel free to see me about any questions that you have. I do not want the path to success for this course to be a mystery. **Also, please talk to me before dropping the course.** Things may not be as bad as you think.
7. *Come to class prepared.* If there is an assigned reading, questions, etc., have it done before class. It makes your class time more efficient and improves understanding.
8. *Expectation of the student.* I expect you to work hard in this class. I am not going to give you anything. You will earn it. I am willing to facilitate your learning as much as I can, but it is up to you to put forth the effort to succeed.
9. *Accommodations.* This University abides by the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, which stipulates that no student shall be denied the benefits of an education "solely by reason of a handicap." If you have a documented disability that may impact your work in this class and for which you may require accommodations, please see the Disability Resource Coordinator as soon as possible to arrange accommodations. In order to receive accommodations, you must be registered with and provide documentation of your disability to: the Disability Resource Office, which is located in the Psychology Building, Suite 232.

Have a great semester and don't hesitate to contact me if you have questions about the course!