

CHEM 452 Winter Quarter 2009 Physical Chemistry for Biochemists I

Administration

1. **Lectures:** MWF 9:30 – 10:20 AM, BAG 154
2. **Course Instructor:** Dr. Bruce H. Robinson
 - **Office:** BAG 212, 543-1773
 - **E-mail correspondence:** robinson@chem.washington.edu . Please put “CHEM 452” in the subject line. If the message is pertinent to the whole class, I will ask you to post it on the online discussion board (see below).
3. **Teaching Assistants:** Alyssa Smith-Begg, alyssa1@u.washington.edu , BAG 118
4. **Tutorial/Office Hours (Optional):**
 - Tuesdays, 9:30 – 10:20, BAG 154 (Tutorial in lecture room).
 - Thursday, 1:30 PM – 2:30 PM, Bagley 212 (Bruce Robinson’s office)
 - An additional hour to be established later, Bagley 212 (Bruce Robinson’s office)
 - Wednesday 11:00 AM – 12:00 PM, Bagley 118 (Alyssa Smith’s office)
 - Friday 3:00 – 4:00 PM, Bagley 118 (Alyssa Smith’s office)
4. **Web site:** <http://courses.washington.edu/bhrchem/>
5. **Online Discussion Board:** <https://catalysttools.washington.edu/gopost/board/>
6. **Text:** Physical Chemistry in the Life Sciences by Thomas Engel, Gary Drobny and Philip Reid (ISBN: 0805382771)
7. **Reserve Texts:** The above text is placed on reserve in the Chemistry library.
8. **Lecture Notes:** The lecture notes will be posted on the class web site near to the lecture.

Holidays and Exams

The midterms and final exam have been scheduled for the following dates:

- Holiday (No Lecture) January 19, 2009
- Midterm 1: Wednesday, February 4, 2009
- Holiday (No Lecture) February 16, 2009
- Midterm 2: Wednesday, March 4, 2009
- Final Exam: Wednesday, March 18, 2009, 8:30 – 10:20 AM , BAG 154

Please check the web site and online discussion board for any changes to these times.

HOMEWORK SCHEDULE

- Homework assignments will be posted on the web site listed above.
- Homework is due by 4 PM on the day indicated and placed in the TA’s mail box; or as requested by Alyssa.
- Homework cannot be turned in during class, faxed or e-mailed. If you will not be around to turn in your homework, please have a friend put it in the appropriate place.. Late homework will not be accepted.
- Answer keys will be posted online after the homework is collected
- You are encouraged to work together on the homework, but you have to turn in your own assignment.

Grading the homework

- 10 points total (except problem set 1A and 1 B)
- 6 points – Have you made an attempt to solve every problem in a thoughtful and methodical fashion?

- 3 points – One random problem will be graded for content. Partial credit will be given. Please make sure that your units are correct and the answers are boxed.
- 1 point – Neatness + Challenge. Are the questions in order, the answers boxed and easy to find? And have you taken the time to reflect on your answer? Taking some time to think about whether your answer “makes sense,” can sometimes alert you to mistakes in the preceding calculation.

Please check your homework with the answer key and make sure that you understand all the problems.

GRADING FOR THE COURSE

Homework sets (100 points total): 20% of the grade
 Midterm 1 (100 points): 20% of the grade
 Midterm 2 (100 points): 20% of the grade
 Final (200 points): 40% of the grade

OPTIONAL TUTORIAL SESSIONS

- Either the TA or the instructor will be present during the *optional* tutorial sessions as listed earlier.
- You may use these times to get started on the homework problems and raise questions about the course material.

DISABILITY

Please contact Disabled Student Services, 448 Schmitz, 543-8924 (V/TTY). If you have a letter from Disabled Student Services, please show me the letter so we can discuss the appropriate accommodations you may need for the class.

Week	Topics	Chapters	Exams
1) 1/5	Introduction, common terminology, work	Ch 1 and 2	
2) 1/12	PV Work, reversible, irreversible expansion	Ch 2	
3) 1/19	State functions, internal energy, enthalpy	Ch 3	
4) 1/26	Thermochemistry	Ch 4	
5) 2/2	Entropy	Ch 5	2/4
6) 2/9	Entropy, Free energy	Ch 5 and 6	
7) 2/16	Free energy, Chemical equilibrium	Ch 6	
8) 2/23	Phase equilibria	Ch 7	
9) 3/2	Solutions, Electrochemistry and Fuel cells	Ch 8 and 9	3/4
10) 3/9	Biological examples and equilibria	Ch 10 and 11	
11) 3/16	Final		3/18

Prerequisite Experience:

Homework: (Worth 100 points total) will be due generally on Tuesday and Friday to be turned in by 4PM in TA mailbox or according to the TA's direction. Any additional arrangements will need to be made directly with the T.A. Assignments will be made from each lecture and posted on the web site. Answer keys will be posted weekly on the web site.

There is nothing more important in the course than doing the homework. Do not just do problems to get something turned in and get a few points; this is your opportunity to discover when you don't know something and to seek help from fellow students, TAs, teachers, texts, posted material, etc. The goal of a homework problem is not the answer; the goal is to

understand the material and how you get the answer. I know of no other way to know whether I understand the material than to test myself with problems.

I also recommend that you rewrite your notes after each lecture into a different notebook to be sure that you indeed understand what was said. Use this as an opportunity to expand on what was left out of lecture but alluded to. Mark parts of the lecture that were unclear or confusing and use the class and tutorial time as an opportunity to clarify what is confusing. If you are confused, please assume that others are similarly perplexed. If I feel it is of general concern we can go over it, otherwise I can suggest that we meet individually.

I am assuming that you had Chemistry 152; and that the text for that course was Zumdahl's "Chemical Principles". Reviewing the material in there would be very valuable for this course. In particular Chapter 5 on ideal gasses, and 9 and 10 on the first and second laws of thermodynamics, will be of fundamental importance in developing the ideas of energy, heat, work, entropy and free energy.

To underscore the importance of homework: The following is a correlation from a similar chemistry course (Chem455m Autumn 2007) of the cumulative homework score and the final exam scores. The strong correlation indicates that doing the homework definitely helps in improving performance on the exams.

