

CHEM 330
Physical Chemistry I
Fall 2009

Dr. Todd Morris, Heim 213 (adjacent to the secretary's office)
Office Hours: MWF: 10 am – 12 noon (or *anytime* my door is open)
Office Telephone: 570-321-4029
Email: morrist@lycoming.edu
textbook URL: <http://bcs.whfreeman.com/pchem8e>

CLASS: MWF from 9:00 to 9:50 AM in Heim 215
LAB: T from 7:45 to 11:35 AM in Heim 204

Course Description:

A study of energy in chemistry and its reactions, including in-depth gas laws, thermodynamics, phases and physical transformations of pure substances and mixtures, equilibrium, electrochemistry, and statistical mechanics. The laboratory involves physicochemical measurements of thermodynamic properties. *Three hours of lecture and one four-hour laboratory period each week. Prerequisites: CHEM 111, MATH 129, PHYS 225-226; or consent of instructor.*

Student Learning Objectives:

Upon successful completion of this course, a student will:

- be able to apply and understand the gas laws
- be able to apply and understand the laws of thermodynamics
- be able to correctly interpret phase diagrams
- be able to understand the thermodynamic basis for phase stability and phase transitions
- be able to understand the thermodynamic basis for the behavior of simple mixtures and solutions
- be able to correctly describe the behavior of systems at or near equilibrium
- be able to correctly describe electrochemical systems

Texts:

Physical Chemistry, 8th edition. Peter Atkins and Julio de Paula (ISBN: 0-7167-8759-8)
ACS Style Guide, 3rd edition
Bound Laboratory Notebook with quadrille pages (for lab use only)
Laboratory Manual for 330-331W (available in the book store).
The lab deposit is \$10 (cash only please).

Supplies:

Calculator with logarithmic and exponential functions (no passing or sharing allowed in exams)
Safety Glasses or Goggles

Lecture Specifics:

Assignments, Evaluation Procedures, and Grading Policy

1. Attendance: Attendance *and* participation at all class meetings is expected.

2. Examinations: Four exams and a comprehensive final exam will be given on the dates below. Exams II, III, and IV are comprehensive and will contain material from earlier exams. Exam keys will be available soon after administration of the exam. Except for the final, you will be given an unannotated “formula sheet” for assistance on each exam. The final exam consists (in part) of the standardized, multiple-choice ACS exam.

Exam I – Wednesday, September 16

Exam II – Wednesday, October 14

Exam III – Wednesday , November 11

Exam IV – Wednesday, December 9

Final Exam – Monday, December 14 8:30-11:30 am

3. Quizzes: Short (2-4 question) quizzes will be given at the beginning of **most** class periods. The quiz questions will consist of material (concepts and equations) from the previous lecture period. The quizzes are worth 5 points. One “pulse point” is given for taking the quiz.

4. Homework: Homework is assigned for each chapter but will **not** be collected nor graded. The answers to the 'b' exercises are in the **back of the book (BOB)** and are *almost* always accurate. We will frequently use the 'a' exercises as practice problems during class time. The recommended homework problems are listed below. Note: Many of the exam questions will be based on these homework questions!

5. Writing Project: We will start the Writing Project at the end of the semester. Only the “Project Topic” (due Mon., Nov. 9) and draft “Project References” (draft due Mon., Dec. 7) will be due this semester. More information about all aspects of the writing project is in the Lab Manual and will be discussed later. The grades will count in the quizzes category. This is designed to allow more time for the Writing Project as it continues in the Spring Semester in Physical Chemistry II 331W.

6. Grading: The maximum number of points is 1000, as illustrated below:

3 *best* exams at 150 pts each = 450 pts
Final Exam = 200 pts
Quizzes = 100 pts
Lab Average = 250 pts
Total = 1000 pts

Your final course grade is determined from the number of points that you have earned during the semester:

A = 920-1000 pts; A- = 900-919 pts;
B+ = 880-899 pts; B = 820-879 pts; B- = 800-819 pts;
C+ = 780-799 pts; C = 720-779 pts; C- = 700-719 pts;
D+ = 680-699 pts; D = 620-679 pts; D- = 600-619 pts;
F = 0-599 pts

Tentative Class Schedule:

Dates	Coverage	Recommended Homework
August 31	Introduction to class; syllabus; pre-req "quiz"	
September 2-11	Chapter 1 and Section 21.1	Chapter 1: Exercises 1-3, 8, 10, 13, 16, 18, 21 Chapter 21: Exercises: 1, 2, 4-6
Wednesday, September 16	EXAM I	Review Chapter 1 and Section 21.1
September 14-28	Chapter 2	Exercises: 2-4, 7, 10, 14, 17, 18, 21, 28
September 30-October 9	Chapter 3	Exercises: 1, 3, 4, 6-10, 12, 14, 15, 18, 22; Problems: 19, 24-26
Wednesday, October 14	EXAM II	Review Chapters 2, 3 plus previous exam material
October 12-October 21	Chapter 4	Exercises: 1, 2, 5, 8, 9
October 23-November 6	Chapter 5	Exercises: 2-4, 6, 7, 9, 11, 16
Wednesday, November 11	EXAM III	Review Chapters 4, 5 plus previous exam material
November 9-November 18	Chapter 6	Exercises: 1, 3, 6, 9, 10, 13, 14
November 20-December 7	Chapter 7	Exercises: 1, 4-6, 8-10, 14-16
Wednesday, December 9	EXAM IV	Review Chapters 6, 7 plus previous exam material
Friday, December 11	In-Class Comprehensive Review	
Monday, December 14	FINAL EXAM	Review all material

Miscellaneous:

Departmental and ACS policies:

The following are not allowed to be used during quizzes and exams: programmable calculators (unless the memory is cleared by the instructor), cell phones, PDAs, headphones, or other personal electronic devices. Personal electronic devices (except calculators) are also not to be used in the laboratory.

College Policies:

Administrative procedures (withdrawals, etc.) will follow the published guidelines and rules of the college and department. As reminders, Friday, September 4 is the last day to **Drop/Add** a course and Monday, November 2 is the deadline for **Withdrawals**.

Disabilities:

If you have a specific disability and choose to request academic accommodations to meet your needs, please consult with Mr. Dan Hartsock, Coordinator of Services for Students with Disabilities. His office is in the Academic Resource Center on the third floor of Snowden Library.

Academic Honesty:

On all exams and lab reports, copying work or allowing another to copy your work and submit it as his/her own is academic dishonesty and can lead to penalties from failing the assignment to dismissal from the college. Always properly cite all sources consulted in labs write-ups to avoid plagiarism. See the Pathfinder or Student Handbook for further information on the college policy on academic dishonesty.

Laboratory Specifics:

1. Attendance. Attendance and participation in lab is mandatory. Each of you will be a part of a group and your absence will affect your group's productivity in lab. Make-up labs may be possible by arrangement with your instructor and group members.

2. Schedule:

Date	Group A	Group B	Date Due
September 1	Check-In/Excel	Check-In/Excel	N/A
September 8	Electrochemistry	Electrochemistry	Friday, September 18
September 15	Exam I review	Exam I review	N/A
September 22	Bomb Calorimetry	Solution Calorimetry	
September 29	Bomb Calorimetry	Solution Calorimetry	Friday, October 9
October 6	NMR Studies	Surface Tension	Friday, October 16
October 13	Exam II review	Exam II review	N/A
October 20	Solution Calorimetry	Bomb Calorimetry	
October 27	Solution Calorimetry	Bomb Calorimetry	Friday, November 6
November 3	Library Time	Cp/Cv Ratios for Gases	
November 10	Exam III review	Exam III review	N/A
November 17	Surface Tension	Cp/Cv Ratios for Gases	Friday, December 3
November 24	Cp/Cv Ratios for Gases	Library Time	
December 1	Cp/Cv Ratios for Gases	NMR Studies	Friday, December 11
December 8	Exam IV review	Exam IV review	N/A

Group A: Michael, Frank, and Emily

Group B: Julie, Carrie, and Casey

More information on lab policies, procedures, and expectations are found near the beginning of the CHEM 330-331W laboratory manual.