

## CH353 – Physical Chemistry I

Spring 2013, Unique 52575

Monday / Wednesday / Friday, 9:00 am – 10:00 am, WEL 2.304

**Instructor:** Dr. Lauren Webb  
WEL 3.212B  
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471-9361

**Office Hours:** Wednesday and Thursday, 10:00 am – 11:00 am, or by appointment

**Teaching Assistant:** Jason Dugger  
WEL 3.306; GAR 0.120  
471-7851

**TA Office Hours:** Tuesday and Thursday, 2:00 pm – 3:00 pm, GAR 0.120

**Recommended Textbook:** *Physical Chemistry: A Molecular Approach*  
Donald A. McQuarrie and John D. Simon

**Webpage:** [http://webb.cm.utexas.edu/courses/CH353\\_Spring\\_2013\\_home.html](http://webb.cm.utexas.edu/courses/CH353_Spring_2013_home.html)

Course material, including the syllabus, daily lecture summaries, homework problems and solution keys, quiz solution keys, and exam solution keys will be available on the course webpage. We will use Blackboard's grade center to post grades. I will periodically communicate important class announcements to you through email. It is very important that you update your UT directory information with the email that you check most often. I will also post these class announcements on the course webpage.

**Course Objective:** This course is an introduction to chemical and statistical thermodynamics. We will begin by studying the fundamental principles of the field with detailed development of the laws of thermodynamics and their connection to molecular properties of a chemical system. We will then apply these concepts to explore physical and chemical equilibrium, solutions and mixtures, and reactive systems. Near the end of the course we will briefly explore chemical kinetics. Throughout the course, I will encourage you to engage the ways that science in general and chemistry in particular affect your daily life.

This course carries the Quantitative Reasoning flag. Quantitative Reasoning courses are designed to equip you with skills that are necessary for understanding the types of quantitative arguments you will regularly encounter in your adult and professional life. You should therefore expect a substantial portion of your grade to come from your use of quantitative skills to analyze real-world problems.

**Lectures and Attendance:** I will not be taking attendance, but I will also not be posting lecture notes. You may compare and copy lecture notes from classmates to make sure you have an accurate and complete set of notes for yourself, but I strongly discourage you from relying on others for your notes. To supplement your own note-taking, I will post daily summaries of what

I consider to be the most important points from that day's lecture, but these will not be comprehensive.

**Quizzes:** There will be seven closed-book, closed-note quizzes given in class on Friday. Quiz dates are given on the schedule below. This quiz will be given during the last 10 to 15 minutes of class and must be turned in when the class period ends at 9:50 am. Each quiz will be worth 50 points and your lowest score will be dropped from your final grade. To help you prepare for these quizzes, each week I will post homework problems and the corresponding solution keys. It is up to you to practice these problems; we will not be collecting your answers, but if you don't do the homework you will probably find the quizzes very unpleasant. Your textbook is another wonderful source of practice problems.

**Exams:** There will be five 50 min exams that will be given during the normal class time. For these exams, you may use any resource that does not have a heartbeat and cannot be connected to the internet. Your textbook and class notes will probably be the most helpful resources for you. Exam dates are noted on the schedule below, so plan now. There will be no makeup exams but your lowest exam score will be dropped from your final grade. If you must miss an exam due to observance of religious holidays, you are required by the University to notify the instructor at least 14 days in advance. Otherwise, you can only make up an exam by providing documented proof of a major life trauma or emergency and only after consultation with the instructor. Semester exams will focus on material introduced since the previous exam; however, the material that we are covering this semester is inherently cumulative, so you will be expected to remember material not covered explicitly on each exam. Review sessions will be scheduled the day before each exam, and extra office hours will be added as needed. A 3 hr final exam will be given on 8 May 2013 at 2:00 pm in a location TBA.

**Exam Locations:** Last names beginning with A – J: WEL 2.304  
Last names beginning with K – Z: PHR 2.108 for Exams 1, 3, 4, 5  
BUR 112 for Exam 2

**Grades:** Quizzes: 300 pts (6 at 50 pts. each)  
Exams: 400 pts (4 at 100 pts. each)  
Final: 300 pts

We will use two possible grading schemes in this course, depending on the final class mean score.

Possibility 1) IF THE FINAL CLASS MEAN SCORE REMAINS ABOVE 700:

Grade: A = 850 and above  
B = 700-849  
C = 550-699  
ntg < 549

Possibility 2) IF THE FINAL CLASS MEAN SCORE DROPS BELOW 700:

Grades above the mean will receive A's and B's. Grades at and below the mean will receive C's, D's, and F's.

I will show grade distributions following each exam to give you an idea of your standing relative to the class mean. This class will not use fractional grading (i.e. +/- grades).

**Students with Disabilities:** The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. For more information, contact the Office of the Dean of Students at 471-6259, 471-6441 TTY. Any student with a documented physical or cognitive disability who requires academic accommodations should do this as soon as possible to request an official letter outlining authorized accommodations for this course. If the accommodation involves testing, you must remind me at least 5 business days before the scheduled exam.

**Honor Code:** “The core values of the University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the University is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.”

Cheating will not be tolerated in this course. When taking quizzes and exams, you may not use any electronic material to assist you except for a calculator for completing arithmetic. Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such dishonesty harms the individual, all students, and the integrity of the University, policies on scholastic dishonesty will be strictly enforced.

**Schedule:** The following is an outline and approximate schedule for topics covered this semester. The quiz and exam dates will not change. Any changes to the course outline will be reviewed in class.

<b>Week</b>	<b>Date</b>	<b>Topic</b>	<b>Chapter</b>	<b>Assignment</b>
1	14 Jan.	Introduction	16	Homework 1
	16 Jan.	Ideal gases	16	
	18 Jan.	Nonideal gases and first law	19	<b>Quiz 1</b>
2	21 Jan.	MLK day – No Class		Homework 2
	23 Jan.	The first law	19	
	25 Jan.	<b>EXAM 1</b>		<b>EXAM 1</b>
3	28 Jan.	The first law	19	Homework 3
	30 Jan.	The first law	19	
	1 Feb.	The first law	19	<b>EC 1</b>
4	4 Feb.	The second law	20-21	Homework 4
	6 Feb.	The second law	20-21	
	8 Feb.	The second law	20-21	<b>Quiz 2</b>
5	11 Feb.	Free energy	22	Homework 5
	13 Feb.	Free energy	22	
	15 Feb.	<b>EXAM 2</b>		<b>EXAM 2</b>
6	18 Feb.	Free energy	22	Homework 6
	20 Feb.	Free energy	22	
	22 Feb.	Free energy	22	<b>Quiz 3</b>
7	25 Feb.	Physical Equilibrium	23	Homework 7
	27 Feb.	Physical Equilibrium	23	
	1 March	Physical Equilibrium	23	<b>Quiz 4</b>
8	4 March	Mixtures and solutions	24-25	Homework 8
	6 March	Mixtures and solutions	24-25	
	8 March	<b>EXAM 3</b>		<b>EXAM 3</b>

**Spring Break: 11 – 15 March**

<b>Week</b>	<b>Date</b>	<b>Topic</b>	<b>Chapter</b>	<b>Assignment</b>
9	18 March	Composition diagrams	24-25	Homework 9
	20 March	Nonideal solutions	24-25	
	22 March	Chemical equilibrium	26	<b>Quiz 5</b>
10	25 March	Chemical equilibrium	26	Homework 10
	27 March	Chemical equilibrium	26	
	29 March	Statistical Thermodynamics	17-18	<b>EC 2</b>
11	1 April	Statistical Thermodynamics	17-18	Homework 11
	3 April	Statistical Thermodynamics	17-18	
	5 April	<b>EXAM 4</b>		<b>EXAM 4</b>
12	8 April	Kinetics	27-29	Homework 12
	10 April	Kinetics	27-29	
	12 April	Kinetics	27-29	<b>Quiz 6</b>
13	15 April	Kinetics	27-29	Homework 13
	17 April	Kinetics	27-29	

<b>Week</b>	<b>Date</b>	<b>Topic</b>	<b>Chapter</b>	<b>Assignment</b>
	19 April	Kinetics	27-29	<b>EC 3</b>
14	22 April	Kinetics	27-29	Homework 14
	24 April	Kinetics	27-29	
	26 April	<b>EXAM 5</b>		<b>EXAM 5</b>
15	29 April	Kinetics	27-29	Homework 15
	1 May	Kinetics	27-29	
	3 May	Kinetics; review		<b>Quiz 7</b>

**FINAL EXAM: Wednesday, 8 May, 2:00 pm. Location TBA.**