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### CHMY 360.01: Applied Physical Chemistry

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# CHMY 360 - Applied Physical Chemistry

## Spring 2015

**Course objectives:** This is a one semester course in physical chemistry. We will study physical principles as they apply to molecular systems and chemical reactions. Our focus for most of the semester will be thermodynamics, which is concerned with transformations of energy in molecular systems. Thermodynamics is relevant for understanding of chemical equilibria and the relationship among chemical and physical processes, work, heat and electricity. In addition, we will study the rates of chemical reactions.

The two semester course in physical chemistry, CHMY 373 and 371, provides more in-depth treatment of physical chemistry, especially of quantum mechanics and related topics (covered in CHMY 371). CHMY 360 will be more superficial and less mathematically demanding. However, we will still be using A LOT of math and some calculus.

**Time & Place:** TR 1:10-2:30 pm CHEM 102

**Instructor:** Klara Briknarova

**Office:** CHEM 111, aka Mouse House (across from CHEM 102)

**Office hours:** TR 12-1 pm and 2:30-3 pm and by appointment

**Phone:** 243-4408

**Email:** [klara.briknarova@umontana.edu](mailto:klara.briknarova@umontana.edu)

**Text:** Atkins & de Paula, Elements of Physical Chemistry, 6<sup>th</sup> edition.

**Prerequisites:** In order to succeed in this class, you need to have working knowledge of chemistry, understand basic physical concepts (mass, speed, force, pressure, energy etc.), convert between different units, and be comfortable with mathematical operations and equations.

**Homework:** The end-of-chapter exercises will provide you feedback on how well you understand the material, and they will help you to master it. I will use some of these exercises in the quizzes and exams.

**Tests and quizzes:** There will be a weekly quiz on most Tuesdays (bring a calculator!), three exams during the semester, and a final exam. Each exam will contribute 20% of your grade. The average of your quizzes will count as one exam grade. You may drop your three lowest quiz grades (including any missed quizzes), but makeup quizzes will not be given. There may be opportunities to earn extra points during the semester.

## Tentative schedule:

Chapter 1: The properties of gases	T 1/27, R 1/29
Chapter 2: Thermodynamics: the First Law	T 2/3 (Quiz 1), R 2/5
Chapter 3: Applications of the First Law	T 2/10 (Quiz 2), R 2/12
<i>Last day to drop a class on CyberBear</i>	<i>F 2/13 5:00 pm</i>
Chapter 4: Thermodynamics: the Second Law	T 2/17 (Quiz 3), R 2/19
<b>Exam I</b>	<b>T 2/24 1:10-3:00 pm</b>
Chapter 5: Physical equilibria: pure substances	R 2/26, T 3/3 (Quiz 4)
Chapter 6: Properties of mixtures	R 3/5, T 3/10 (Quiz 5)
Chapter 7: Chemical equilibria: the principles	R 3/12, T 3/17 (Quiz 6)
Catching up/Review	R 3/19, T 3/24
<b>Exam II</b>	<b>R 3/26 1:10-3:00 pm</b>
<i>Spring break – no classes</i>	<i>3/30 - 4/3</i>
<i>Last day to drop a class without dean's signature</i>	<i>M 4/6 5:00 pm</i>
Chapter 9: Chemical equilibria: electrochemistry	T 4/7, R 4/9
Chapter 10: The rates of reactions	T 4/14 (Quiz 7), R 4/16
Chapter 11: Accounting for the rate laws	T 4/21 (Quiz 8), R 4/23
Catching up/Review	T 4/28 (Quiz 9), R 4/30
<b>Exam III</b>	<b>T 5/5 1:10-3:00 pm</b>
Review	R 5/7
<b>Final Exam</b>	<b>T 5/12 1:10-3:00 pm</b>

CHMY 360: Applied Physical Chemistry

Name: \_\_\_\_\_

Class (circle one): Junior    Senior    Other (please explain): \_\_\_\_\_

Major(s): \_\_\_\_\_

Minor(s): \_\_\_\_\_

Chemistry classes taken: \_\_\_\_\_

*Class names please rather than numbers*

Physics classes taken: \_\_\_\_\_

Math classes taken: \_\_\_\_\_

Biology classes taken: \_\_\_\_\_

What do you plan to do after you graduate?

Why are you taking this class, and what do you expect from it?

Other comments: