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CHMY 360.01: Applied Physical Chemistry

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CHMY 360 - Applied Physical Chemistry

Spring 2018

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 spontaneous chemical and physical processes, chemical equilibria, 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.

CHMY 360 will not be offered after Spring 2018.

Time & Place: TR 1-2:20 pm CHEM 102

Instructor: Klara Briknarova

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

Office hours: TR 12-1 pm and 2:20-3 pm and by appointment

Phone: 243-4408

Email: klara.briknarova@umontana.edu

Text: Atkins & de Paula, Elements of Physical Chemistry, 6th 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 NON-GRAPHING calculator!), three exams during the semester, and a final multiple-choice ACS exam. Each exam will contribute 20% of your grade. The average of your six best quizzes (out of 9 total) will count as one exam grade. Any missed quizzes will count as zero, and no makeup quizzes will be given. There may be opportunities to earn extra points during the semester.

Moodle supplement: Answer keys for the quizzes and exams will be posted on Moodle.

Special accommodations: If you are registered with Disability Student Services and require special accommodations, please make appropriate arrangements.

Grading: Final grades will be assigned using the classic 90/80/70/60 A-F grading system. Slight curving of this grading system (down but not up) might occur but don't count on it. This class does not offer a credit/no credit option. Drops after April 4 will generally not be recommended.

Tentative schedule:

Chapter 1: The properties of gases	T 1/23, R 1/25 T 1/30 (Quiz 1)	Week 1
Chapter 2: Thermodynamics: the First Law	R 2/1 T 2/6 (Quiz 2)	Week 2
Chapter 3: Applications of the First Law	R 2/8	Week 3
<i>Last day to drop a class on CyberBear</i>	<i>F 2/9 5:00 pm</i>	
Chapter 4: Thermodynamics: the Second Law	T 2/13 (Quiz 3), R 2/15 T 2/20 (Quiz 4)	Week 4
Chapter 5: Physical equilibria: pure substances	R 2/22	Week 5
Exam I	T 2/27 1:00-2:50 pm	
	R 3/1	Week 6
	T 3/6 (Quiz 5)	
Chapter 6: Properties of mixtures	R 3/8	Week 7
	T 3/13 (Quiz 6), R 3/15	Week 8
	T 3/20	
Exam II	R 3/22 1:00-2:50 pm	Week 9
<i>Spring break – no classes</i>	<i>3/26 - 3/30</i>	Week 10
<i>Last day to drop a class without dean's signature</i>	<i>M 4/2 5:00 pm</i>	
Chapter 7: Chemical equilibria: the principles	T 4/3, R 4/5 T 4/10 (Quiz 7)	Week 11
Chapter 10: The rates of reactions	R 4/12	Week 12
	T 4/17 (Quiz 8), R 4/19	Week 13
Chapter 11: Accounting for the rate laws	T 4/24 (Quiz 9), R 4/26	Week 14
Exam III	T 5/1 1:00-2:50 pm	
Review	R 5/3	Week 15
Final Exam	T 5/8 1:10-3:10 pm	