

Chem 4120/6120 and 4121 (tutorial)  
Spring Semester 2014  
Physical Chemistry II  
3 Semester Credits (4120/6120); 2 Semester Credits (4121)

Instructor: Ivaylo Ivanov (4120/6120 lecture);

TA: Hengfu Wu (4121 tutorial)

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Office Hours: W 10:30-12:00 or by appointment

Lecture Time and Location: 4120/6120: MWF 12:00-12:50, Classroom South Room 306

Help Sessions: Special Course Chem 4121 is a "problem-solving" class for assistance with homework problems and with the required mathematics. Any student having difficulty with homework in Physical Chemistry II should register for this course. Mr. Hengfu Wu will administer the tutorial.

Course Prerequisites: Chem 3410; Math 2212; Phys 2211K; and Phys 2212K

Texts: *Quantum Chemistry and Spectroscopy* (QCS) and *Thermodynamics, Statistical Thermodynamics and Kinetics* (TSK) by Engel and Reid, Pearson, 2010, 3<sup>rd</sup> edition.

Course Description: Physical Chemistry II is a 3 credit hour semester course that covers the subjects of atomic and molecular structure (quantum chemistry) and statistical thermodynamics.

Quizzes, Final, Grading: Homework problems will be assigned but not graded. There will be **four 45-minute quizzes** (see schedule at the end of the syllabus) and your **lowest quiz score will be dropped**. If a student misses a quiz, their score will be zero (0) for that quiz. The quizzes will count for 40% (Chem 4120) of your grade. A standardized ACS exam covering quantum mechanics will be given on Monday, March 24<sup>th</sup> and count for 30% of your grade (Chem 4120). The score from the ACS cannot be dropped. A comprehensive final shall be given on Monday, May 5<sup>th</sup> at 10:45am and will account for 30% of your grade (Chem 4120). All quizzes and exams are closed book but one 8/12 x 11" sheet of notes can be brought to the quizzes and two sheets of notes can be brought to the Final Exam. For students enrolled in Chem 6120, the grade breakdown is 33.3 % quizzes, 33.3 % ACS exam, 33.3 % Final.

Dates	Chapter	Subject
1/13, 15, 17	1	Early Developments in Quantum Theory
1/22	2	Wave Phenomena
1/24, <u>27</u> , 29	3, 4	Postulates of Quantum Mechanics
2/31, <u>3</u>	5, 6	Particles-In-A-Box and Applications
2/5, <u>7</u> , 10	7	Vibration/Rotation of Diatomics
2/12, <u>14</u> , 17	8, 9	Spectroscopy of Diatomics
2/19, 21	9	Hydrogen Atom
2/24, 2/26	9, 10	Many Electron Atoms
2/28, 3/3	10, 11	Atomic Spectroscopy
<u>3/5</u> , 7	12	Introduction to Chemical Bonding
3/10, 12, 14	13, 14	Chemical Bonding in Diatomics/Polyatomic
3/17-23	--	Spring Break
<u>3/24</u>	--	ACS Exam
3/26, 28	12*, 13*	Probability, Boltzmann Distribution
3/31, 4/2, 4/4	15*	Statistical Thermodynamics
4/7, 9, 11	14*, 15*	Monatomic & Diatomic Gases
4/14, 16, 18	15*	Chemical Equilibrium
4/21, 23	16*	Kinetic Theory of Gases
4/25	Review	
<u>5/5</u>	Final	(Comprehensive, starts at 10:45 a.m)

Chapters without an asterisk are from QCS; Chapters with asterisks are from TSK.

Quiz dates are underlined.

#### Quiz Schedule

1/27	(1)
2/14	(2)
3/5	(3)
3/24	(4 ACS)
4/14	(5)

#### **Statements required by University Policies and Regulations**

Please note, the course syllabus provides a general plan for the course; deviations may be necessary.

It is required that we refer to the Policy on Academic Honesty (Section 409). The university's policy on academic honesty is published in the Faculty Affairs Handbook and the On Campus: The Undergraduate Co-Curricular Affairs Handbook and is available to all members of the university community. The policy represents a core value of the university and all members of the university community are responsible for abiding by its tenets. Lack of knowledge of this policy is not an acceptable defense to any charge of academic dishonesty. All members of the academic community -- students, faculty, and staff -- are expected to report violations of these standards of academic conduct to the appropriate authorities. The procedures for such reporting are on file in the offices of the deans of each college, the office of the dean of students, and the office of the provost.