

Chem 4120/6120 and 4121 (tutorial)  
Spring Semester 2012  
Physical Chemistry II  
3 Semester Credits (4120/6120); 2 Semester Credits (4121)

Instructor: Stuart Allison (4120/6120 lecture); Hengfu Wu (4121 tutorial)

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Office Hours: MWF 11:00-12:00 (in 236 Kell) or by appointment

Lecture Time and Location: 4120/6120: MWF from 12:00-12:50 in Room 305 General Classroom Bldg. (GCB)

Lecture Notes: Lecture Notes are available online as a pdf file. You can access them by going to the GSU Department of Chemistry website (<http://chemistry.gsu.edu>), select "Undergraduate" icon, select "Student Corner" icon, select "Chem 4120 Lecture Notes" icon to download the lecture notes. It should be noted that there may be some deviation in the actual lectures from those of the notes and that you are responsible for the material covered in the lectures. Homework problems and sample exam questions can be found at the end of the notes.

Help Sessions: Special Course Chem 4121 will be held Friday in 317 GCB from 1:00-2:40. This is a "problem-solving" class for homework, and assistance with mathematics will also be provided. Any student having difficulty with homework in Physical Chemistry 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 Engels and Reid, 2<sup>nd</sup> Edition, Pearson, 2010.

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

Quizzes, Final, Grading: Homework problems will be assigned but not graded. There will be a 25-minute quiz every Monday except on 1/16, 2/27, 3/5, and 4/2 (10 total) and your lowest quiz score shall be dropped. A comprehensive "Makeup" quiz will be given on 4/23/12 for anyone who misses one of the regularly scheduled quizzes. 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 shall be given on Monday, April 2, and count for 30% of your grade (Chem 4120). A comprehensive final shall be given on Wednesday, April 25, starting at 10:45 AM and will account for 30% of your grade (Chem 4120). All quizzes and exams are closed book; but 1 sheet (8.5 by 11 inch) of *handwritten* notes can be used for each quiz and two sheets of notes can be brought to the Final Exam. The ACS exam is closed

book. Also, calculators can be used for all exams. (Be sure that your calculator is working since they will not be provided nor will it be permitted to use someone else's calculator.) For students enrolled in Chem 6120, the grade breakdown is 33.3 % quizzes, 33.3 % ACS exam, 33.3 % Final.

### Tentative Course Schedule:

Dates	Chapter	Subject
1/9, 11, 13, 18, 20	1	Early Developments in Quantum Theory
1/23, 25, 27	2, 3	Wave Phenomena, Postulates of QM
1/30, 2/1, 3	3, 4	Particle-in-a-box
2/6, 8, 10	5, 6	Applications of the Particle-in-a-box
2/13, 15, 17	7	Harmonic Oscillator
2/20, 22, 24	7	Rigid Rotor
2/27, 29, 3/2	--	Spring Break
3/5, 7, 9	8	Spectroscopy of Diatomics
3/12, 14, 16	9, 10	Hydrogen, Many Electron Atoms
3/19, 21, 23	10, 11	Atomic Spectroscopy
3/26, 28, 30	12, 13, 14	Chemical Bonding in Diatomics and Polyatomics
4/2	(1-14)	ACS Exam
4/4, 6	12*, 13*, 15*	Probability, Intro. Statistical Thermodynamics
4/9, 11, 13	14*, 15*	Monatomic and Diatomic Gases
4/16, 18	15*	Chemical Equilibrium
4/20	REVIEW	
4/23	Makeup Quiz	
4/25	FINAL(comprehensive, starts at 10:45 AM)	

Chapters without an asterisk are from QCS; chapters with an asterisk (\*) are from TSK.

### Quiz (Exam) Schedule

1/23 (1)  
1/30 (2)  
2/6 (3)  
2/13 (4)  
2/20 (5)  
3/12 (6)  
3/19 (7)  
3/26 (8)  
(4/2: ACS Exam)  
4/9 (9)  
4/16 (10)  
4/23 (Makeup)  
(4/25 at 10:45 AM: Final)