

Chem 4150/6150

Fall Semester, 2015

3 Semester Credits

Professor: Dr. Stuart Allison, 382 Petite Science Center, (e-mail: sallison@gsu.edu)

Office Hours: Dr. Allison: MWF from 9:30-10:45 a.m. or by appointment

Lecture Time and Location: MWF from 11:00-11:50 a.m. in Room 304 Sparks

Course Prerequisites: Math 2212 or equivalent with a grade of C or higher.

Text: *Physical Chemistry, Principles and Applications in Biological Sciences*, 5th Edition, by Tinoco, Sauer, Wang, Puglisi, Barbison, Rovnyak, Pearson, 2014.

Course Description: "Introduction to Biophysical Chemistry", Chem 4150/6150, is a 3 credit hour semester course that covers the principles of thermodynamics, statistics, transport, and kinetics with emphasis on biophysical applications. Chapters 1-9 of the text will be covered.

Quizzes, Exams, Paper Presentation, and Grading: There will be seven quizzes, a paper presentation (required for Chem 6150 students, but optional for Chem 4150 students), and a final exam. The lowest quiz score will be dropped and the quizzes will count for 40% (presentation option) or 50% (no presentation option) for Chem 4150 students. For Chem 6150 students the quizzes will count for 40% or your overall grade. Quizzes will be over material covered in class since the previous quiz (or Chapter 2 in the case of Quiz 1). A comprehensive "Makeup" quiz will be given at the end of the semester for anyone who has missed one of the regularly scheduled quizzes. **Quizzes will not be given at any time other than the scheduled lecture period. Should you miss a quiz, you may use it as your drop grade or take the makeup quiz.** The Final Exam will count for: 50% of your grade (Chem 4150, no presentation option) or 40% (Chem 6150 or Chem 4150 with presentation option). Quizzes will be closed book, but one 8.5 by 11 inch sheet of handwritten notes can be brought to all quizzes (including the Makeup). The same is true for the Final Exam, but two pages of handwritten notes can be used.

In addition to the Quizzes and Final Exam, all Chem 6150 students will be required to give a 10 minute (Power Point) presentation on a paper. This will give us all an opportunity to explore some of the modern applications of biophysical chemistry in research. Paper presentations such as this have been popular in similar courses such as polymer chemistry and statistical mechanics. My preference is to schedule these throughout the semester rather than having them all given at the end. Your subject must be selected from one of the "Suggested Reading" articles located at the end of Chapters, 2-10 of the textbook. You are free to select any of these articles, but only one student can present on a single article and it is on a first come, first serve basis. Report the article of your choice to me as soon as possible and provide me with an electronic copy of the article which I will distribute to the class before the presentations are given. I will keep the class informed of articles that have already been selected so they can no longer be chosen. At least two days before your presentation, please provide me with a written one to two page abstract of your talk. These presentations will count for 20% of your overall grade and the whole class will be involved in grading them. Your grade on the presentation will be based both on your abstract and actual delivery.

Chem 4150 students can choose whether or not to give a presentation or not and if they do, it will count for 20% of their overall grade. The same procedures (discussed in the previous paragraph) will apply to all students (Chem 4150 and 6150) giving presentations. If a Chem 4150 student elects to give a presentation, they must notify the instructor (S. Allison) in writing no later than Friday, November 6, 2015.

The Makeup quiz will be on Monday, December 7, and will count as much as a regularly scheduled quiz. It will be comprehensive.

Homework: Homework problems will be assigned, but not graded. Also, solutions to select problems will be provided to the class as a study aid. It is essential for you to work problems in order to understand the material covered in the lectures. Homework problems are designed to help you improve and test your knowledge of each of the topics covered in the course. Periodically, homework problems will be placed directly on the tests. In addition, many test questions will be similar to homework problems. Homework problems will be assigned on a weekly basis and answers/solutions to certain problems will be distributed to the class.

The University requires that faculty members must, on a date after the midpoint of the course, October 13, 2015 to:

- 1) give a WF to all those students who are on their rolls but no longer taking the class; and
- 2) report the last day the student attended or turned in an assignment.

Holidays: Labor Day, Monday, 9/7/15
Thanksgiving Break, M-F 11/23-27/15

Tentative Schedule

Date	Chapter	Subject
8/24,26,28	2	First Law, properties of ideal gases
8/31,9/2	2	Enthalpy, heats of reaction
9/4 (Fri)	2	Quiz 1
9/7 (Mon)	-	Labor Day Holiday (no class)
9/9,11	3	Entropy, Second Law
9/14,16,18	3	Free Energy
9/21 (Mon)	3	Quiz 2
9/23,25	4	Chemical Equilibrium (ideal gases)
9/28,30,10/2	4	Chemical Equilibrium (solutions & solids)
10/5 (Mon)	4	Quiz 3
10/7,9	5	Statistical Thermodynamics
10/12,14,16	5	Applications of Statistical Thermodynamics

10/19 (Mon)	5	Quiz 4
10/21,23	6	Phase Equilibria
10/26,28,30	6	Colligative Properties
11/2 (Mon)	6	Quiz 5
11/4,6	7	Introduction to Electrochemistry
11/9,11,13	8	Transport Properties
11/16 (Mon)	7,8	Quiz 6
11/18,20	8	Electrophoresis
11/23,25,27	-	Thanksgiving Break (no class)
11/30,12/2	9	Introduction to Kinetics
12/4 (Fri)	8,9	Quiz 7
12/7 (Mon)	(comprehensive)	Makeup Quiz
12/9	(comprehensive)	Final Exam (10:45AM-1:15 PM)