

Chem 453

Biophysical Chemistry I

Fall 2010

Professor

Eitan Geva

e-mail

eitan@umich.edu

Office Hour

Friday 12:00-1:00 PM

Office

2000D Chem.

GSI:

Surma Talapatra

tsurma@umich.edu

Monday 2:00-3:00 PM
Wednesday 1:00-2:00 AMSLC alcove #4
SLC alcove #4

Bei Ding

bei@umich.edu

Monday 3:00-4:00 PM
Thursday 1:00-2:00 AMSLC alcove #4
SLC alcove #4**Website:**

- Registered students will be granted access to the course website via <https://ctools.umich.edu>.
- Lecture slides, problem sets, answer keys and announcements from the instructor and GSI will be posted on the website.

Required textbook:

"Molecular Thermodynamics" by Donald A. McQuarrie and John D. Simon (University Science Books, ISBN-10: 189138905X).

Class Schedule:

Lecture (Geva):	Section 100	MWF 11:00-12:00 PM	Room 1300 Chem
Discussion (Talapatra):	Section 101	Monday 1:00-2:00 PM	Room 1628 Chem
Discussion (Talapatra):	Section 102	Tuesday 12:00-1:00 PM	Room 1632 Chem
Discussion (Ding):	Section 103	Monday 1:00-2:00 PM	Room A867 Chem
Discussion (Ding):	Section 104	Tuesday 12:00-1:00 PM	Room A867 Chem

Discussion sessions:

- Attending the discussion sessions is required!**
- There will be no discussion sessions or office hours during the first week of classes (Sep. 7-10).
- There is no difference between the two discussion sessions.
- The discussion sessions will involve working out examples related to the material covered in the lecture with emphasis on the development of problem solving skills.

Exams:

Midterm Exam 1:	Mon.	October 11	6:00-8:00 PM	1400 CHEM
Midterm Exam 2:	Tue.	November 16	6:00-8:00 PM	AUD D AH
Final Exam:	Mon.	December 20	10:30-12:30 PM	Location TBA

- You may bring **two** 8-1/2 by 11 inch formula sheets to mid-term exam 1, **four** formula sheets to mid-term exam 2, and six formula sheets to the final exam. You may write on both sides. You should also bring a **calculator** to the exams. In addition, you will be provided with sheets of physical constants and conversion factors and a periodic table similar to those posted in the course web site .

Grading: Midterm Exam 1 100 pts.

Midterm Exam 2	250 pts. (cumulative)
Final Exam	350 pts. (cumulative)
6 Problem Sets	300 pts. (50 pts. each)
Total:	1000 pts

Problem Sets:

Students are **required** to submit 6 problem sets. Each problem set is worth 50 points. **The problem sets will be posted on the web site.** The dates for posting and submission deadlines are given in the table below. **Homework assignments must be submitted to the instructor by the end of the lecture on the indicated dates.**

Problem set #	Date posted	Submission deadline
1	Sep. 8 2009	Sep. 27 2010
2	Sep. 27 2009	Oct. 11 2010
3	Oct. 11 2009	Oct. 25 2010
4	Oct. 25 2009	Nov. 8 2010
5	Nov. 8 2009	Nov. 22 2010
6	Nov. 22 2009	Dec. 10 2010

The problem sets are due by the end of the lecture on the indicated date.

- **Problem sets must be prepared legibly with work shown in an orderly and logical manner. The GSI may deduct points for problem sets that are messy or difficult to follow. Credit will not be given for numerical answers without worked solutions or for a correct answer if it is evident that your procedure is incorrect, unclear, or insufficient.**
- **Numerical answers must be given with correct units.**
- **Submission after the deadline will not be accepted (unless approved by the instructor ahead of time).**
- **Answer keys will be posted on the CTools site following the submission deadline.**

Tentative list of topics:

1. Energy levels of atoms and molecules.
2. Properties of gases.
3. The Boltzmann factor and partition functions.
4. Partition functions of gases.
5. The first law of thermodynamics.
6. The second law of thermodynamics.
7. The third law of thermodynamics.
8. Helmholtz and Gibbs free energies.
9. Phase equilibrium.
10. Liquid-liquid solutions.
11. Solid-liquid solutions.
12. Chemical equilibrium.
13. Nonequilibrium thermodynamics and kinetics.