

Chemistry 342, (01:160:342), Spring 2012

Physical Chemistry of Biochemical Systems

David Case, instructor. Office: 208a Proteomics, phone: 848-445-5885; cell: 609-651-6817

email: case@biomaps.rutgers.edu

Spring 2012, Tuesdays and Fridays, 10:20-11:40am, SEC 208

This is a one-semester physical chemistry course with an emphasis on applications to biochemical systems and to life sciences. It will cover three main areas: thermodynamics, biochemical kinetics and biochemical spectroscopy. Please note that Chem. 342 is an imperfect substitute for Chem 328 (Physical Chemistry II): 328 is the second semester of a two-semester sequence in Physical Chemistry, whereas 342 is a single-semester course. [Chem. 341 exists in the catalog of courses, but is not currently offered.] Please talk to me if you plan to take 342 in place of 328.

The course text is *Physical Chemistry for the Life Sciences, 2nd edition*, by Peter Atkins and Julio de Paula, (W.H. Freeman, 2011). The text is available in both hard-copy and e-book formats. We will pretty much follow the book straight through, but will mostly skip Chapters 10 and 13. The table below gives an approximate time schedule; detailed reading assignments will be made as the class proceeds.

Week starting	Subject	Chapter
Jan 17	First law of thermodynamics	1
Jan 24, 31	Second law of thermodynamics	2
Feb 7, 14	Chemical & phase equilibria	3,4
Feb 21, 28	Ion and electron transport	5
Mar 6	Chemical reaction rates	6,7
Mar 20	Enzyme reactions, allostery	8
Mar 27, Apr 3	Basic quantum mechanics	9,(10)
Apr 10, 17	Methods for studying macromolecules	11
Apr 24	Optical spectroscopy and photobiology	12

The course website is <http://casegroup.rutgers.edu/lnotes.html>. Reading and homework assignments and additional course materials will be posted there. There will be three exams: Feb. 21 and Mar. 27 (in-class), and the final exam (date to be announced.) The course grade will be determined by homework (20%), the mid-term exams (each 20%) and the final examination (40%). Office hours initially will be Fridays after class; additional hours will be scheduled based on input from students.