

Chemistry 460/395

Biophysical Chemistry

Fall 2012

Dr. Duarte Mota de Freitas

FH125, Exts. 83091 or 87045, E-mail dfreita@luc.edu

<u>Lecture</u>	<u>Date</u>	<u>Topic</u>
1	8/27	Introduction; Amino Acids
2	8/29	Non-covalent Interactions
3	8/31	Protein Structure
4	9/5	Protein Stability
5	9/7	Energy Minimization & Molecular Dynamics
6	9/10	Nucleic Acids: Composition and Structure
7	9/12	Biological Membranes
8	9/14	Dialysis & Gel Filtration
9	9/17	Diffusion
10	9/19	Sedimentation
11	9/21	Centrifugation
12	9/24	Electrophoresis
13	9/26	Affinity Chromatography
14	9/28	Viscosity
15	10/1	Mass Spectrometry
16	10/3	Review

Lecture	Date	Topic
17	10/5	EXAM (lectures 1 through 15)
18	10/10	Ligand Interactions at Equilibrium
19	10/12	Isothermal Titration Calorimetry (ITC)
20	10/15	Kinetics of Ligand Interactions
21	10/17	Kinetics of Ligand Interactions
22	10/19	UV/Vis. Spectroscopy
23	10/22	Fluorescence Spectroscopy
24	10/24	Fluorescence Spectroscopy (cont.)
25	10/26	Circular Dichroism
26	10/29	IR Spectroscopy
27	10/31	Raman and Resonance Spectroscopy
28	11/2	X-ray Crystallography
29	11/5	X-ray Crystallography (cont.)
30	11/7	NMR
31	11/9	NMR
32	11/12	NMR
33	11/14	EPR
34	11/16	EPR
35	11/19	Student Presentations
36	11/26	Student Presentations
37	11/28	Student Presentations

Lecture	Date	Topic
38	11/30	Student Presentations
39	12/3	Student Presentations
40	12/5	Student Presentations
41	12/7	Review

The FINAL EXAM will be on M, 12/10, 1:00 - 3:00 pm, FH 129, and will test the material covered in lectures 18 through 34.

Classroom: FH 129

Classtime: M, W, F 11:30 a.m. - 12:20 p.m.

Office Hours: M, W 9:30 a.m. - 11:00 a.m., FH 125. Other times by appointment - contact instructor at dfreita@luc.edu or call Exts. 83090 or 87045 and leave a message.

By the end of the first week of classes, students who need special testing accommodations should give the instructor documentation that has been approved by the Services for Students with Disabilities (SSWD).

Academic Integrity: Please refer to the policies on dishonest academic behavior in the Graduate or Undergraduate Studies Catalogs (for details see www.luc.edu/academics/catalog/undergrad/reg_academicgrievance.shtml).

Grading Policy: 100 points for each exam, and 100 points for the class presentation. No make-up midterm will be given. Missing the first exam requires written supporting documentation from a physician or equivalent, and a score will be prorated based on the averages of the first midterm and final exam. A make-up final will be given only written supporting documentation is provided. The instructor must be informed by 9:00 am of the date of the exam.

Class grades will be calculated by two separate methods. The method that provides the highest letter grade will be used.

Method 1: The mean of the total raw scores for the class will be calculated and set at the C+/B- cutoff. One-third of the standard deviation will be added or subtracted from the mean to arrive at the remaining grades. For example, a student must be one standard deviation above the mean to obtain a grade of A-.

Method 2: The following scale of total raw scores will be used to establish class letter grades:

A = 100-85

A- = 84-80

B+ = 79-75

B = 74-70

B- = 69-65

C+ = 64-60

C = 59-55

C- = 54-50

D+ = 49-45

D = 44-40

F = Less than 40

Suggested Textbooks:

Biophysics Textbook online:

<http://www.biophysics.org/ProfessionalDevelopment/SelectedTopicsInBiophysics/tabid/2311/Default.aspx>

P. Atkins and J. de Paula, *Physical Chemistry for the Life Sciences*, second edition, Freeman, 2011.

D. Sheehan, *Physical Biochemistry: Principles and Applications*, second edition, Wiley-Blackwell, 2009.

J.P. Allen, *Biophysical Chemistry*, Wiley-Blackwell, 2008.

G.G. Hammes, *Physical Chemistry for the Biological Sciences*, Wiley-Interscience, 2007.

K.E. van Holde, W.C. Johnson, and P.S. Ho, *Principles of Physical Biochemistry*, second edition, Prentice-Hall, 2006.

I. Tinoco, Jr., K. Sauer, J.C. Wang, & J.D. Puglisi *Physical Chemistry: Principles and Applications in Biological Sciences*, fourth edition, Prentice-Hall, 2002.

Other Useful Texts

J.M. Berg, J.L. Tymoczko, and L. Stryer, Biochemistry, seventh edition, W. H. Freeman & Co., 2012.

I.H. Segel, Enzyme Kinetics, Wiley & Sons, 1993.

C. Cantor & P. Schimmel, Biophysical Chemistry, W. H. Freeman & Co., 1980. (Three volumes - a very good, but somewhat outdated reference text)