

**Syllabus for MMBB476/576 Biophysical Chemistry Instructor: Gary Daughdrill; Office: LSS140; Email: gdaugh@uidaho.edu; phone: 5-9230; Office hours T,R 10:00-11:00**

Week of:	Van Holde, Johnson, and Ho	Tuesday	Thursday
Jan. 15	Chapt. 1,2 plus Supplement	Review the syllabus and goals for the course	L1-Historical Review of Thermodynamics and introduction to the 1st law
Jan. 22	Chapt. 2 plus Supplement	L2-Entropy, Free Energy, and Equilibrium-the 2 <sup>nd</sup> and 3 <sup>rd</sup> laws	L3-Heat Capacity-evaluating protein stability
Jan. 29	Chapt. 3 plus Supplement	L4-Heat Capacity-evaluating protein stability	L5-Molecular Thermodynamics-bonding and nonbonding interactions
Feb. 5	Supplement	Discussion, Reading, and Homework Assignment	Discussion, Reading, and Homework Assignment
Feb. 12	Chapt. 3,4	L6-Molecular Thermodynamics-protein stability and the hydrophobic effect	L7-Statistical Thermodynamics-models for structural transitions in biopolymers
Feb. 19	Chapt. 4 plus supplement	L8-Statistical Thermodynamics-the coil to helix transition	L9-Protein Folding-a delicate balancing act
Feb. 26	Exam Week	Review for Exam 1	Exam 1
Mar. 5	Supplements	L10-The Unfolded State-functional relevance of dynamic flexible structures	L11-The Unfolded State-functional relevance of dynamic flexible structures
Mar. 12	<b>SPRING BREAK, SPRING BREAK, SPRING BREAK, SPRING BREAK, SPRING BREAK!!!!!!!!!!!!</b>		
Mar. 19	Supplement	Return exam 1 and tour of NMR facility.	Practical aspects of multidimensional protein NMR
Mar. 26	Chapt. 15,8	L12-Chemical Equilibria-protein/protein and protein/DNA interactions	L13-Quantum Mechanics and Spectroscopy- Hamiltonian operators
Apr. 2	Chapt. 8,9,10	L14-Quantum Mechanics and Spectroscopy- Hamiltonian operators	L15-Quantum Mechanics and Spectroscopy-Absorbance and CD
Apr. 9	Chapt. 11	L16-Quantum Mechanics and Spectroscopy-Fluorescence	Review for Exam 2
Apr. 16	Exam Week Chapt. 6	Exam 2	L17-X-ray Diffraction-determining high resolution protein structures
Apr. 23	Chapt. 8,12	L18-Principles of Nuclear Magnetic Resonance Spectroscopy	L19-Protein Structure from Nuclear Magnetic Resonance Spectroscopy
Apr. 30	Chapt. 12	L20-Protein Dynamics from Nuclear Magnetic Resonance Spectroscopy	Review
May 7		Final: Monday, May 7 10:00-12:00	

**Course Text:** Principles of Physical Biochemistry; Kensal E. VanHolde; ISBN: 0-13-720459-0. In addition, lecture notes can be downloaded as portable document files (pdf) at: <http://www.webpages.uidaho.edu/~gdaugh/BIOPHY~1/>.

### Course Description

MMBB 476/576, Biophysical Chemistry, will provide students with a foundation in Physical Chemistry with an emphasis on understanding biological processes.

**Exams and Grading Policy:** There will be three noncumulative examinations administered in class according to the schedule above and a reading and homework assignment during the fourth week of class that will cover a seminal paper in the area of protein structure and stability. The exams and the homework assignment will be worth 100 points each. In addition, you will be graded on your written note taking skills (no computers). You will be required to turn in a copy of your notes prior to each exam for my inspection. Grading for notes will be based on both legibility and content. Each set of notes will be worth 33 points for a total of 100 points. Finally, there will be some problems assigned prior to the exams to prepare students. While these assignments will not be graded there accurate completion will be necessary for good performance. Graduate students will be required to give an in class presentation on some aspect of biophysical chemistry that will be worth 100 points. This presentation can be related to the students' thesis research. In accordance with the University of Idaho conduct code any student caught misrepresenting their own work will receive a failing grade for the class. Make-up exams will only be given for authorized university absences (M-1). **No Cell Phones!!!** Any student that makes or receives a cell phone call will have their final letter grade reduced.

**Time and Place:** TR 11:00 am-12:15am in AD Rm. 328

### Corequisites/Prerequisites

Prereq: Chem 372, Phys 112, MMBB 380,382; Coreq: Math 160 or 170; Graduate Prereq: MMBB541