

MBioS 413/513: SYLLABUS Fall 2008

Instructors: William B. Davis; ChulHee Kang; Lisa M. Gloss (coordinator)

Course web page on eLearning@wsu: <https://elearning.wsu.edu/webct>

Texts: *Lehninger Principles of Biochemistry, 5th Edition* by Nelson & Cox, 2008
 Branden & Tooze *Introduction to Protein Structures, 2nd Edition* (1999) (strongly recommended)

Date	Lecture	Topic	Lecturer	Lehninger Chapter	B&T Chapter
08/25	1	Energetics and thermodynamics	WBD	1.2-1.3	
08/27	2	Water, pH and amino acids	WBD	2	1
08/29	3	Protein structure: 1°	WBD	3.1,2 3.5, 4.1	p.347-351
09/01	<i>Labor Day--WSU Holiday</i>				
09/03	4	Protein Post-translational Modifications	WBD	6.5	
09/05	5	Protein structure: 2°	WBD	4.2	2
09/08	6	Fibrous protein structures	WBD	4.3	
09/10	7	Protein structure: 3° patterns (1)	WBD	4.3	2.5
09/12	8	Protein structure: 3° patterns (2)	WBD	4.3	2.5
09/15	9	Protein structure: 4°	WBD	4.3	11
09/17	10	Carbohydrates: Mono and Disaccharides	WBD	7	
09/19	11	Carbohydrates: Polysaccharides	WBD	7	
09/22	12	Carbohydrates: Glycoproteins/Glycobiology	WBD	7	
09/24	13	Membranes: Structures & Assembly	LMG	10.1-2, 11.1-2	
09/26	14	Membranes: Proteins	LMG	11.1	
09/29	15	Membranes: Transport	LMG	11.3	
10/01	Exam 1 11:10 am to 1:00 pm CONTACT WBD if you have a 12:10 class				
10/03	1	Catalytic mechanisms I	CHK	6.1	
10/06	2	Catalytic mechanisms II	CHK	6.2	
10/08	3	Serine proteases I	CHK	6.4	
10/10	4	Serine proteases II	CHK	6.4	
10/13	5	Lysozyme	CHK	6.4	
10/15	6	Coenzymes & Glutathione Reductase	CHK	pg. 192	
10/17	7	Protein sequencing, synthesis	CHK	3.4	
10/20	8	DNA structure: 1°, 2° and stability	CHK	8.1-8.3	
10/22	9	No Lecture			
10/24	10	DNA supercoiling	CHK	24.2	
10/27	11	RNA structure & classes II	CHK	8.2	
10/29	12	Nucleic acid chemistry	CHK	8.3	
10/31	13	X-ray crystallography	CHK	Box 4.4	
11/03	14	NMR spectroscopy	CHK	Box 4.4	
11/05	Exam 2 11:10 am to 1:00 pm CONTACT CHK if you have a 12:10 class				
11/07	1	Cooperativity and allostery	WBD	5.1	
11/10	2	Hemoglobin structure and function I	WBD	5.1, 6.5	
11/12	3	Hemoglobin structure and function II	WBD	5.1, 6.5	
11/14	4	Macromolecular Methods I: Chromatography	LMG	3.3	
11/17	5	Macromolecular Methods II: Electrophoresis	LMG	3.3	
11/19	6	Macromolecular Methods III: Centrifugation	LMG	3.3	
11/21	7	Enzyme Kinetics I: Introduction & binding	LMG	web page	

11/24-11/28		<i>Thanksgiving Break</i>		
12/01	8	Enzyme kinetics II: Michaelis-Menten	LMG	6.3
12/037	9	Enzyme kinetics III: Bi-substrate kinetics	LMG	6.3
12/058	10	Enzyme kinetics IV: Inhibition	LMG	6.3
12/08	11	Protein Folding I: Introduction & Methods	LMG	4.4, pg. 82 & 725
12/10	12	Protein folding II: Stability	LMG	4.4
12/12	13	Protein folding IV: Kinetics	LMG	4.4
12/18		Exam 3, during Final Exam period; 3:10 to 5:10 pm		

Instructor contact information:

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Course web page resources:

Lecture notes will be posted on the course web page on the WSU eLearning system. Students are expected to download the notes for themselves. It is recommended that the notes be printed out and brought to class for the appropriate lecture. The instructors will make every effort to have the notes posted on the web page the night before the material will be covered in lecture, if not earlier.

Other resources on the web page include exams and homework example questions from previous years and links to other web sites relevant to material covered in lectures

Other resources and suggested texts:

Berg, Tymoczko, Stryer *Biochemistry, 5th Edition* (2002) Best general introductory text. Heavily slanted toward animal biochemistry, but superbly written and illustrated. *Highly recommended for 413 students.*

Mathews, van Holde & Ahern *Biochemistry, 3rd Edition* (2000) Excellent text, more advanced than Stryer. Has nice, short descriptions of "Tools of Biochemistry."

Voet & Voet, *Biochemistry, 3rd Edition, vol 1* (2003) Text formerly used for this course, complementary to Lehninger.

MBioS 413/513, Fall 2007 Policies

Overview

This is a core course in graduate-level biochemistry as well as a culminating course for undergraduate majors. It will be demanding and challenging--we assume that students enroll because of a desire or need to master the fundamental body of information that constitutes modern biochemistry. Thus, we expect a substantial level of motivation, maturity and discipline. It is our goal to provide training consistent with the highest national and international standards to students from a range of backgrounds. Successfully accomplishing this goal requires active and responsible participation of the entire class. We expect you to master all material covered in class, handouts, homework and the assigned sections of the text. You should attend every class meeting, take complete notes, read the text, learn the material as it is presented and ask questions when these efforts are not sufficient. We assume that students in the course have a solid background in both biology and chemistry or are capable of filling in gaps as necessary. Some students may find that even their best efforts cannot overcome inadequate backgrounds or other impediments. If you perceive that you are having trouble, talk with an instructor *early in the term*. We will help you decide your best strategy, which may include dropping the course in order to gain sufficient background so you can successfully take this course at a later time.

Prerequisites

2 semesters of organic chemistry (Chem 345 & 346 or the equivalent)
1 semester introductory biochemistry (MBioS 303 or the equivalent)

Examinations

Three examinations, each covering about 14 lectures, are given during the term. The times and dates for the examinations are indicated on the course outline. All students are expected to take the examinations at these times. The third exam is given in the institutionally scheduled time during the final exam week. Like the third exam, the first two exams are scheduled for two hours, beginning during the regular lecture period. If a student has a conflict with the second hour of the exam (a class at 12:10), it is the student's responsibility to notify the instructor giving the exam, in writing, and schedule an alternative time to take the exam. The location of the first two exams will be confirmed during the semester; the third exam will be in the normal lecture room, Webster 17. As instructors, we have no control over the scheduling of the final exam, and are required to give the third exam on the university-assigned day and time. It is your responsibility to arrange any vacation travel such that you are able to take the third exam when scheduled.

Early or make-up examinations are strongly discouraged. If such examinations do occur, they may be re-written and be more difficult than the regular examination. Alternative scheduling will only be permitted for students who have submitted a written request and received approval at least one week prior to the examination, unless there is a medical emergency. Permissible reasons for alternative exam times are limited to conflicts with teaching responsibilities, another class or a professional meeting. At times, a group of students may have the same conflict, and thus a second time may be scheduled. This alternative exam is ONLY available to the students who have submitted a written request and received approval. Rescheduling of an exam because of a medical emergency will require written documentation from a medical practitioner of the nature of the medical emergency.

The examinations are designed to assess knowledge/understanding of the information covered AND the ability to apply this information and the concepts to new situations. The style of our exams may be unfamiliar to some. Therefore, we provide examples of previous exams, posted on the course web site. We encourage all students to review them.

Grading

It is our responsibility that the grades awarded accurately reflect our best evaluation of the degree to which each student has demonstrated mastery of the material. Our expectation, fulfilled over the many years that this course has been given, is that most students who complete the course will earn a B- or better (in recent years, >70% have done so). Thus the mean and median of the distribution of final grades are within the B range. We do not assign letter grades to each exam; rather, numerical scores are provided to give the students an assessment of where they stand in the class. Only after all exams are taken, do we assign final letter grades based upon the distribution of the total, summed scores for the exams. In the assignment of grades, we are sensitive to situations in which specific students who had difficulties were able to overcome them. Weight is given to significant improvement in performance over the sequence of the exams.

513: Each exam is worth 100 points and they are equally weighted.

413: 413 students are graded on the same curve as the 513 students. However, your exams are shorter--expect to answer 90 out of 100 points. The totals are then scaled to 100%. Extra credit is often given for correctly answering the additional 10 points on the exam.

Asking questions and Help Sessions

We encourage questions during lectures and will generally address them immediately. If you are confused or unsure, it is likely that others around you are in a similar state--so ask a question.

Help sessions will be scheduled by the individual instructors; times and room will be confirmed during the class periods. Generally, the help sessions will be scheduled for the weeks just before the

exams. We expect that students attending help sessions will have made their best efforts to understand the material from lecture and text before each session. Student participation is essential at the help sessions. These provide an opportunity for students to ask questions in an informal atmosphere and to listen to the questions posed by other students and hear their answers.

In addition, the instructors are generally available immediately after the lectures to answer specific questions and provide guidance. The instructors do not have scheduled office hours, as experience has shown that no matter when they are scheduled, it is not convenient to some students. Therefore, the instructors encourage students, individually or as a small group, to arrange appointments for help at mutually convenient times when needed. It is particularly important to do this early in the term (not right before an exam), if you perceive that you are having particular difficulties.

Finally, a useful test of the mastery of a subject is the ability to explain it to others. We encourage students to study together, and use each other as audiences for such explanations (but you can also try it on anyone, friend or family, who is willing to listen).

Academic dishonesty

Academic dishonesty will result in a grade of "F" for this course without the option to withdraw. Formal documentation will be filed with the Office of Student Conduct at WSU. Academic dishonesty is defined as cheating, falsification, fabrication, multiple submission, plagiarism, abuse of academic materials, complicity or misconduct in research (WAC 504-25-310 in Standards of Conduct for Students)."

Students with Disabilities Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, please visit the Disability Resource Center (DRC). All accommodations MUST be approved through the DRC (Admin Annex Bldg, Room 205). Please stop by or call 509-335-3417 to make an appointment with a disability specialist. If you have questions, please contact Rosie Pavlov at pavlovr@wsu.edu or 335-3417. Additional information is available on the DRC website is www.drc.wsu.edu.