

**Instructor:** Kurt Miller, Ph.D.  
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Office Hrs: Monday 2-4 PM & by appointment

**Prerequisite Coursework:** **MOLB 4600:** Grade of C or better in both MOLB 3000 and CHEM 2420 or 2300; **MOLB 5600:** consent of instructor.

**Course Description:** Discussion of the structure and function of major biomolecules, including proteins, carbohydrates, nucleic acids and lipids, will provide the foundation for understanding biochemical, molecular and cellular processes. Normally offered Spring semester.

**Course Website:** Lecture slides and other information will be posted at the MOLB 4600/5600 course website. The website can be accessed at <http://www.uwyo.edu/molecbio/courses/molb-4600/>.

**Required Textbook:** The textbook *Lehninger Principles of Biochemistry* by Nelson & Cox, 6th edition, 2013, W. H. Freeman and Company, is required for the course. The study guide *The Absolute, Ultimate Guide to Lehninger Principles of Biochemistry Study Guide and Solutions Manual* by Osgood & Ocorr, 6th edition, 2013, W. H. Freeman and Company, may be useful as a supplement in working with the textbook, but is not required.

**Disability Statement:** If you have a physical, learning, sensory, or psychological disability and require accommodations, please let me know as soon as possible. You will need to register with, and provide documentation of your disability to University Disability Support Services (UDSS) in SEO, room 330 Knight Hall.

**Lecture Schedule:** The lectures will closely follow the schedule listed below. You are strongly advised to have completed textbook reading assignments and reviewed lecture slides prior to coming to class. While attendance of lectures is not mandatory, it is strongly recommended.

**Exams:** There will be 4 exams in the course. The first 3 exams will be held during regularly scheduled lecture periods. The 4th test is scheduled during finals week, but is not cumulative. Exam dates and chapters covered are listed below. Note that exam dates will not be changed unless the University is closed due to inclement weather. Students requesting special accommodations for testing should see me by no later than 1 week prior to the first exam.

<b>Test</b>	<b>Date</b>	<b>Coverage</b>	<b>Points</b>
<b>Exam I</b>	<b>Thursday, Feb. 19</b>	<b>Chaps. 2, 3, 4</b>	<b>100</b>
<b>Exam II</b>	<b>Tuesday, Mar. 24</b>	<b>Chaps. 4, 5, 6</b>	<b>100</b>
<b>Exam III</b>	<b>Thursday, Apr. 16</b>	<b>Chaps. 7, 8</b>	<b>100</b>
<b>Exam IV</b>	<b>Tuesday, May 12</b>	<b>Chaps. 10, 11</b>	<b>100</b>

Exam IV is scheduled from 10:15-11:30 AM on Tuesday, May 12. The room assignment for Exam IV will be announced in class and posted on the course website.

**Exam Questions:** Exams will contain a mixture (typically 80%/20%) of multiple choice and short answer questions. You are responsible for all material covered in reading assignments and in class.

**Bonus Points:** Each exam will contain 2 bonus questions worth 2 points each. Bonus points will be added to your raw score before determining your percentage score for the exam.

**Makeup Exams:** Makeup exams due to extracurricular activities, etc. will be allowed only if you have an official excuse for your absence such as obtained from the Office of Student Life, Knight Hall. Those who do not have an official excuse for missing an exam risk receiving a score of 0% for that exam.

**Grading Policy: MOLB 4600.** Your percentage score for the course will be calculated on the basis of the four exams, which are worth a total of 400 pts. **MOLB 5600.** Your percentage score for the course will be calculated based on your performance on the four exams (400 pts) plus a graduate paper, which is worth 100 pts (500 pts total). Information about the graduate paper is presented below.

Percentage scores for both MOLB 4600 and 5600 will be rounded to the next higher whole number for decimals  $\geq 0.5$ , and to the next lower whole number for decimals  $< 0.5$ . Your grade for the course then will be determined using the following scale:

**A: 100-90    B: 89-80    C: 79-70    D: 69-60    F:  $\leq 59$**

Note, that no "extra credit" assignments are allowed under any circumstances. Academic dishonesty will not be tolerated. (Refer to UW Regulation 6-802 at <http://www.uwo.edu/generalcounsel/new-regulatory-structure/index.html>).

**Graduate Paper:** The graduate paper (10-12 pages, double-spaced) must be written on a topic that is covered in the course (see Lecture Schedule & Topics, below). In addition, the topic of the paper must be cleared in advance with the instructor. The paper (worth 100 pts) is due the final week of classes in the semester. It should consist of five sections--Abstract, Introduction, Core Text, Conclusions, and References--and should be written at the level of the textbook or above. The paper will be graded based on the following criteria: depth, breadth, clarity, literature resources, and spelling and grammar.

**Semester Deadlines:** Please consult the 2015 Spring Class Schedule for important University dates and deadlines. It is your responsibility to initiate paperwork for Drop/Add, Course Withdrawal, etc. well before deadlines.

### Lecture Schedule & Topics:

Class	Date	Chap.	Topics*
1	Jan. 27		Course introduction
2	Jan. 29	2	Noncovalent interactions, pH, weak acids/bases, buffers
3	Feb. 3	3	Amino acids and peptides
4	Feb. 5	3	Peptides, proteins, protein methods

5	Feb. 10	3	Protein methods, primary structure of proteins
6	Feb. 12	4	Overview of protein structure, secondary structure of proteins
7	Feb. 17	2, 3, 4	Exam I Review
<b>8</b>	<b>Feb. 19</b>	<b>2, 3, 4</b>	<b>Exam I</b>
9	Feb. 24	4	Tertiary and quaternary structures of proteins, protein folding
10	Feb. 26	5	Oxygen-binding proteins
11	Mar. 3	6	Intro to enzymes, how enzymes work
12	Mar. 5	6	Enzyme kinetics
13	Mar. 10	6	Enzymatic reactions, regulatory enzymes
14	Mar. 12	4, 5, 6	Exam II review
			<b>SPRING BREAK</b>
<b>15</b>	<b>Mar. 24</b>	<b>4, 5, 6</b>	<b>Exam II</b>
16	Mar. 26	7	Monosaccharides, disaccharides, polysaccharides
17	Mar. 31	7	Glycoconjugates, the sugar code
18	Apr. 2	8	Bases and nucleotides, nucleic acid structure
19	Apr. 7	8	Nucleic acid structure, nucleic acid chemistry
20	Apr. 9	8	Nucleic acid chemistry, other functions of nucleotides
21	Apr. 14	7, 8	Exam III review
<b>22</b>	<b>Apr. 16</b>	<b>7, 8</b>	<b>Exam III</b>
23	Apr. 21	10	Storage lipids, membrane structural lipids
24	Apr. 23	10	Other lipid functions, working with lipids
25	Apr. 28	11	Structure of biological membranes
26	Apr. 30	11	Membrane dynamics, solute transport
27	May 5	11	Solute transport
28	May 7	10, 11	Exam IV review
<b>29</b>	<b>May 12</b>	<b>10, 11</b>	<b>Exam IV</b>

\* Reading and problem assignments will be announced in class prior to each lecture.