Fall 2019 CHEM 452 BIOCHEMISTRY I

Sec. 001, 3 credits

Pre-requisites: Chem 326 (Organic Chemistry)
Meet on: M,W,F from 9:00 AM - 9:50 AM, Room: **SSS 0111**
Overall course objectives: Chem 452 is a 3 credit course, and the first in a two semester sequence that includes Chem 454. This course is intended for, but not restricted to, Biochemistry/Molecular Biology (BMB) majors. Consequently, some topics that are typically covered in a traditional biochemistry course will not be covered in depth in the Chem 452-454 sequence, but instead are covered in the many other courses within the BMB program. These include certain laboratory techniques for isolating and characterizing biological molecules, the flow of genetic information, bioinformatics, and signal transduction. The prerequisite for Chem 452 is general chemistry up through the second semester organic chemistry course (Chem 326). This semester we will discuss the fundamental chemical, structural, and functional properties of the major classes of biological molecules, with particular focus on the proteins. We will also introduce other important biomolecules, including the carbohydrates and lipids, and will investigate how more complicated supramolecular systems, such as cell membranes, sensory systems and cellular motors operate at the molecular level. Chem 454 will subsequently focus on metabolic pathways that are used for the extraction of energy from the environment and for the degradation and synthesis of biological molecules. The discipline related outcomes for Chem 452 include:

• Applying your knowledge of general and organic chemistry to predicting the structures and interactions of biological macromolecules and enzyme catalysis.
• Developing an understanding of how the chemical structures and physical properties of biological molecules relate to their function.
• Developing an understanding of how biological molecules interact with one another to produce complex, self-regulating systems, and how chemical energy is utilized to drive and sustain these processes.

Texts Required: ***Biochemistry***, 9th edition, by Berg, Tymoczko, Stryer

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Instructor: Scott C. Bailey-Hartsel, Ph.D. (Dr. H)
Office: P-461 or P-465A, Office phone: 836-4746, cell: 715-523-1957 e-mail: hartsesc@uwec.edu
Office Hours: I will be available to help you during the following days and hours listed below for this course. You are welcome to set up an appointment with me at other times if you need extra help or cannot come for help at the hours indicated below.

Day	Time
MW	1-2—or arranged (that is the best way)

Examinations: There will be 3 hourly exams, each 100 pts (a part of exam may be take-home).

Final Exam: The final exam will be comprehensive (100 pts).

Materials on which you will be tested: You will be responsible for the materials we cover in class, any assigned text or web readings. There is a mountain of material in this class, so don't fall behind in readings and practice problems.

Examinations and Make-up Policies: Attendance Policy: Attendance will be monitored by sign up sheet. Please email or text me if you know you will miss class. In the event of an absence, you are responsible for all materials covered, and all announcements and assignments made**.** As a general rule, make ups for missed in-class activities, quizzes, exams, etc. will be provided only when due to an authorized absence. **It is the student's responsibility to inform the instructor of such situations and to provide appropriate documentation.** Students will need to consult with the instructor regarding the nature of the make ups and due dates. Work that is late for non-authorized reasons will not receive full credit and if it is too late, it will not receive any credit. Although students will not be penalized when absences are authorized, it is important to understand that in some cases the make up work may be significantly different from the original assignments, exams, etc.

Statement on Academic Integrity: I consider any academic misconduct in this course as a serious offense, and I will pursue the strongest possible academic penalties for such behavior. The disciplinary procedures and penalties for academic misconduct are described in the UW-Eau Claire *Student Services and Standards Handbook* (http://www.uwec.edu/sdd/publications.htm) in the section titled, "Chapter UWS 14—Student Academic Disciplinary Procedures."

Quizzes: There will often be a (usually) brief quiz or problem(s) due each week on Friday except the first week and exam weeks. *Quizzes cannot be made up*, but if you have a legitimate excuse as outlined above, you will receive the average grade of all your other quizzes for the missed one. Quizzes are highly variable, ***based on assigned reading*** and may be worth anywhere from 2 to 15 points, so be prepared! Quizzes may be either paper or D2L based.

Homework: Practice homework problems will be assigned, but not *usually* collected, except for more involved problems (I will make it clear which are to be collected). Problems will usually come from the end of the chapters and will be announced on the class web site. Quizzes will often be based on these.

Lecture Attendance: An attendance list will be posted on the bulletin board--you are to put initials beside your name, otherwise you will be counted as absent for that lecture. We may do problems in class sometimes, so bring your calculator. Every three *unexcused* absences will result in a loss of 10 points.

Grading: The scores and number of examinations, quizzes, and final exam will be as shown below. In general, the grade scale below will apply. However, the class average may be used to adjust the scale.

POINTS (tentative):

Exams	300
Quizzes, homework	100
Final	100
TOTAL	500

Tentative scale (this can change!!!)

	C+ 75-77%
A 92-100%	C 69-74%
A- 89-91%	C- 67-69%
B+ 87-88%	D+ 64-66%
B 80-86%	D 60-63%
B- 78-79%	D- 58-59%

Tentative Topical Schedule for Chemistry 452

Week Dates	Topics	Read Chapters
1. 9/4-6	Unity and Principles of Life	1
2. 9/9-13	Protein Composition and Methods	2,3
3. 9/16-20	Protein Composition and Methods	2,3
4. 9/23-27	Exploration of Evolution Bioinformatics	6
5. 9/30-10/4	Hemoglobin: Protein in Action	7
6. 10/7-11	Enzymes: Concepts and Kinetics	8
10/14	**Exam I**	
7. 10/14-18	Catalytic Strategies	9
8. 10/21-25	Regulatory Strategies	10
9. 10/28-11/1	Carbohydrates	11
10. 11/5-11/9	Lipids/membranes	12,13
11/4	**Exam II**	
11. 11/11-15	Lipids/membranes	12,13
12. 11/18-22	Lipids/membranes/Signal Transduction	13,14
THANKSGIVING!!! 11/27-29		
13. 11/26-30	Signal Transduction/sensory systems	14, 33
14. 12/2-6	Intro Metabolism/thermodynamics	15
12/9	**Exam III**	
15.12/9-13	Intro Metabolism/thermodynamics	15

Final Exam: Monday December 16, 1PM