**CHEM520 Spring 2023 Section 001 Course Syllabus**

**Course Specifics:**

Instructor: Dr. Jason C. Hurlbert

Office: Sims 301B

Office hours: T 10:00-11:00, F 10:00-11:00 and by appointment

Phone: 323-4928

E-mail: hurlbertj@winthrop.edu

**Meeting Times:**

Tuesday and Thursday, 8:00 - 9:15 AM, Sims 112

3 credit hours

## Textbook and Required Materials

1. Biochemistry, 9th ed by Berg, Tymoczko, Gatto and Stryer
2. Every student needs to purchase a Rocketbook reuseable notebook and a set of Frixion pens (links to each in addition to instructions for using the app can be found in the Content folder of the course Blackboard shell). Your homework, tests and final exam will be written in the pages of this notebook and you will send them to me using the Rocketbook app on your phone. I'd plan on getting several of the blue or black ink pens in addition to the multicolor pack

**Course Outline and Objectives:**

**We will cover the following topics during the semester:**

Chemical Foundations

Amino acids, protein structure and protein folding

Working with proteins and proteomes

Molecular evolution and Bioinformatics

The function and regulation of hemoglobin

The function and regulation of enzymes

Carbohydrates

Lipids and Membranes

Signal Transduction

Glycolysis

Citric Acid Cycle

**Course Outline:**

Biochemistry is the branch of science focused on studying the structure, function and interactions of the molecules found in living systems. Its very name tells you that it is a hybrid discipline incorporating biology, organic chemistry, physical chemistry and even physics into the study of the chemical reactions and interactions that allow life to exist. The goal of this course is to familiarize you with the vocabulary and concepts necessary to understand how living cells function at the molecular level. We will spend one half of the semester learning the basics of biological molecules: amino acids, proteins, sugars, polysaccharides, lipids and membranes. In the second half of the semester, we will put these basic building blocks into motion and study membrane transport, signal transduction, glycolysis and the citric acid cycle.

This is a 500 level course, which means that the concepts we will discuss are advanced and will require you to spend a lot of time and work outside of the classroom to fully understand and apply them. To ensure that you do not fall behind, the bulk of the points in the course will come from online homework assignments in Sapling plus, specifically Reading Quizzes and Homework problems. These assignments are not meant to overburden you, but rather to help you learn as we go and to prevent you from trying to cram before each exam.

This class is meant to push you to your limits and will help you tie together concepts and information you have learned in general chemistry, organic chemistry and various biology courses you have taken during your college career. Every bit of effort you put into this class will be rewarded with a better understanding of the role of chemistry in biological systems and will be reflected in the grade you earn for the course. Go ahead and plan to work on the material for this class at least 10-15 hours a week.

**CHEM523 Section 001 Tentative Course Schedule**

For specific dates and assignments, please visit the "Course Schedule" page from the link on the main page of the course website.

**Week Topic**

1 Course Introduction and the Importance of water

2 Amino acids and Protein Structure

 Exploring proteins and proteomes

3 Computational biology

4 Hemoglobin: Structure and function

5 Test 1

6 Enzyme Kinetics and Catalytic strategies

7 Regulatory Strategies

8 Test 2

9 Carbohydrates

10 Spring Break

11 Lipids and Membranes

12 Signal Transduction

13 Test 3

14 Glycolysis and the Citric Acid Cycle

15 Test 4

**Grading for the course**

**Reading Quizzes**

Because of the sheer volume of material covered this semester (13 chapters in 15 weeks!) you must approach this course differently than you would other courses. You must read the textbook, ideally BEFORE coming to lecture, so that you have a better grasp of what you don't understand. Once we have wrapped up the lectures on a given chapter, you will be expected to have read the chapter and answer some basic questions about the material. These are meant to help you stay on track and avoid falling behind.

**Homework Problems**

Homework assignments (6 in total) will be due throughout the course, usually the week after finishing a topic. The goal of these assignments is to help you review the material covered in the chapter so that you know what to spend the most time on during the in-class test review or while you study for the test.

**Tests**

Four tests will be administered during the semester. Understanding concepts from the beginning of the semester will be crucial to understanding concepts discussed at the end of the semester, so while the tests are not strictly cumulative, students are always responsible for material learned throughout the semester. Each exam will be worth 100 points. Exams will be taken during the class meeting time indicated on the Detailed Class Schedule webpage.

**Final Exam**

A cumulative final exam will be given on the scheduled date at the end of the semester.

**Extra Credit Opportunities**

Throughout the semester you will be given several opportunities to earn extra credit points. These opportunities will be challenging and are meant to be difficult. Failure to complete the assignment exactly as instructed will result in no points being awarded. Extra credit assignments are always non-negotiable: You do the assignment completely, you do the assignment well and you do the assignment in the manner it was intended to be done or you do not get any bonus points.

**Tests:**

Test 1 (11 February, 2023)

Test 2 (5 March, 2023)

Test 3 (4 April, 2023)

Test 4 (20 April, 2023)

Each test will have a value of 100 points

**Final Exam 8:00AM Saturday, 29 April, 2020**

The final exam is cumulative and you must make at least a 50% on the exam to pass the course. The final exam will cover the entire course and will have a value of 200 points

**Total Possible Points**

Reading Quizzes 7 @ 25 points each = 175 points

Homework 6 @ 50 points each = 300 points

Tests 4 at 100 points each = 400 points

Final Exam = 200 points

Total Possible Points = 1075 Points

**Grades**

A: 90 - 100%

B+: 87 - 89%

B: 80 - 86%

C+: 77 - 79%

C: 70 - 76%

D: 60 - 69%

F: <59%

**Students taking the course for graduate credit**

Any student taking the course for graduate credit will be required to prepare a final paper (20 pages) tying together several topics discussed in the course. The topic must be discussed with and agreed upon by the instructor. Once a topic is chosen, the instructor will provide dues dates for the: a) Literature review of the topic, b) Outline of the paper and c) Novel figures to be created (multiple sequence alignments, molecular images, reaction mechanisms, etc.) to be provided throughout the semester.

**Technology in the Classroom**

No cellular phones may be used when class is meeting. Once class starts, all cellular telephones must be turned to silent mode for the duration of class. Should your cellular telephone ring while the class is meeting, you will be asked only once to silence it. A second violation of this policy will result in immediate removal from that class session. Anyone caught using these devices during class without prior permission will immediately be asked to leave the class. Anyone caught texting, using Facebook or other forms of social media during class will be immediately ejected from class. This policy is non-negotiable and will be enforced without exception. ANY and ALL violations of these rules will result in forfeiture of all earned bonus points and violators will also be ineligible for future extra credit opportunities.

**Drop Policy:** As described in the Winthrop University Undergraduate catalog

Student Code of Conduct: As noted in the Student Conduct Code: “Responsibility for good conduct rests with students as adult individuals.” The policy on student academic misconduct is outlined in the “Student Conduct Code Academic Misconduct Policy” in the online student handbook.

## COVID-19 Statement: The health and safety of the campus community is Winthrop’s top priority. As socially responsible members of this community, everyone is expected to engage in daily health self- monitoring and to stay home (residence hall or off-campus housing) from on-campus class, work, or activities if they begin experiencing any COVID-related symptoms. Please do not attend class if you have a fever or any signs of the COVID virus, do not attend class if your roommate or someone you have close contact with acquires the virus, and be respectful of others’ desire to remain COVID-free. Masking on campus remains optional but strongly encouraged, especially in indoor settings around others. Use the Patient Portal COVID-19 form to report illness or exposure and upload the positive test, if relevant. Students who violate WU guidelines will be asked to comply. Continued failure to comply may result in referral to the Dean of Students Office as a student conduct violation.

## COVID-Related Absence: COVID-19 Statement: The health and safety of the campus community is Winthrop’s top priority. As socially responsible members of this community, everyone is expected to engage in daily health self- monitoring and to stay home (residence hall or off-campus housing) from on-campus class, work, or activities if they begin experiencing any COVID-related symptoms. Please do not attend class if you have a fever or any signs of the COVID virus, do not attend class if your roommate or someone you have close contact with acquires the virus, and be respectful of others’ desire to remain COVID-free. Masking on campus remains optional but strongly encouraged, especially in indoor settings around others. Use the Patient Portal COVID-19 form to report illness or exposure and upload the positive test, if relevant. Students who violate WU guidelines will be asked to comply. Continued failure to comply may result in referral to the Dean of Students Office as a student conduct violation.

## Online Learning: Statement concerning course management: Any student enrolled in courses at Winthrop regardless of modality (traditional in-person, online, hybrid, ...) is entitled access to all campus resources. These resources include, but are not limited to, admissions counseling, recreational facilities, and health, library, and academic services. Questions regarding access to these resources should be directed to the assigned academic advisor.

Syllabus Change Policy: Should any changes be made to this document, they will be announced in class and everyone will be encouraged to download the latest copy of the document.

Students with Disabilities/Need of Accommodations for Access: Winthrop University is committed to providing access to education.  If you have a condition which may adversely impact your ability to access academics and/or campus life, and you require specific accommodations to complete this course, contact the Office of Accessibility (OA) at 803-323-3290, or, accessibility@winthrop.edu. Please inform me as early as possible, once you have your official notice of accommodations from the Office of Accessibility.