CHEM523: Biochemistry I (Fall 2022)

Instructor:
Dr. Jason C. Hurlbert
Office: Sims 301B
Office hours: M 10:30-11:30 AM, T 4:00-5:00 PM, R 12:30-1:30PM and by appointment
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Course Meeting Times: MWF 9:00 – 9:50AM in Sims 113B

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 are on the course website). 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 Website

The course syllabus will be posted on the Blackboard course shell for CHEM523, however we will use the departmental webserver for the semester. The link to the course page on the server is:

http://chem.winthrop.edu/faculty/hurlbert/link_to_webpages/courses/chem523/chem523home.html

This website will take priority over anything on Blackboard. All Powerpoint files, MP3 audio recordings of lectures, MP4 movies showing biochemical reaction mechanisms will always be found on the Departmental webserver. The Blackboard course shell will only be periodically updated, so your first reference for the course should always be

http://chem.winthrop.edu/faculty/hurlbert/link_to_webpages/courses/chem523/chem523home.html

Failure to notice an assignment deadline on the chem.winthrop.edu website is not an excuse for missing the assignment.

Course Goals and Objectives

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 third of the semester learning the basics of biological molecules: amino acids, proteins, sugars, polysaccharides and nucleic acids. In the second third of the semester, we will learn about the techniques necessary to study biological molecules and the rules governing enzymatic function. Finally, in the last part of the semester, we will look at the key reactions and processes that allow cells to convert the static information contained within the genome into functional proteins that allow the cell to adapt to its environment.

In order to accomplish these goals, we will rely upon various computational methods and current biochemical research papers in addition to the textbook and lecture notes. A large portion of your grade in the course will be based upon your implementation of these methods on your own as you describe and characterize proteins that have been assigned to you. Your efforts will culminate in a verbal presentation to the class and a 10 page review article discussing your proteins. 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.

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.

Student Learning Outcomes

Upon the completion of this course, students will:

1) Understand the concepts and vocabulary of modern biochemistry.
2) Understand the related nature of chemistry and biology.
3) Better understand how general chemistry, organic chemistry and physical chemistry are related to biological processes.
4) Understand modern methodologies and experimental approaches to studying biochemistry.
5) Utilize modern bioinformatics software in the study of biological molecules.
6) Be able to better read and interpret scientific research articles.
7) Be able to communicate scientific concepts by verbal and written means.

These learning outcomes mesh well with the four University Level Competencies (ULCs) that describe the skills Winthrop faculty have outlined for students to develop during their tenure here. These include:

Competency 1: Winthrop graduates think critically and solve problems.
You will be regularly tested on your abilities to read, interpret and apply information that ties together biology, general, organic and physical chemistries as they apply to life's processes.

Competency 2: Winthrop graduates are personally and socially responsible.
You will be expected to work with others in the class, while striving to complete assignments individually and with your own personal interpretations.

Competency 3: Winthrop graduates understand the interconnected nature of the world and the time in which they live.
Biochemistry is an interdisciplinary science and during this course you will realize the interdependence of biology, physics and chemistry. You will gain an appreciation of how each field can be interpreted in terms from the others.

Grading for the Course

Reading Quizzes

Because of the sheer volume of material covered this semester 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. To help you get into the habit of reading the chapter BEFORE coming to class, there will be a short (4 question) reading quiz about the material we will discuss. These assignments must be completed on Rocketbok pages and sent to me BEFORE the start of lecture. Reading quizzes can be found on the "Reading Quiz and Homework Assignment" page on the course website.

Homework Problems

Homework assignments (10 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. All homework assignments in this class will be using Rocketbook pages and must be sent to me by midnight on the date the assignment is due.

Tests

Three 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 test will be worth 100 points. Tests will be taken during the class meeting time indicated on the Detailed Class Schedule webpage.

Final Exam

A cumulative final exam will be given at 11:30AM on Friday, December 10. The Final exam will last 2.5 hours.

Extra Credit Opportunities

Throughout the semester you will be given several opportunities to earn extra credit points. Some of these will be in the form of pop quizzes given during the scheduled lecture times, whereas some of 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.

Total Possible Points

Reading Quizzes: 10 @ 5 points each = 50 points
Homework: 10 @ 20 points each = 200 points
Tests: 3 at 100 points each = 300 points
Final Exam: 200 points
Total Possible Points = 750 Points

Grading

A: 94-100%
A-: 90-93%
B+: 87-89%
B: 80-86%
C+: 77-79%
C: 70-76%
D: 60-69%
F: <60%

Students taking the course for graduate credit

Any student taking the course for graduate credit will be required to prepare an extended final presentation (20 minutes) and final paper (20 pages) for the protein assignment.

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

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 coursemanagement: Any student enrolled in courses at Winthropregardless 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.