Colorado State University Department of Biochemistry and Molecular Biology
BC 351-801 Principles of Biochemistry

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Office Hours: Office hours would be a little strange for an online course considering that many of you are out of state or a significant distance from Ft. Collins. As such I will not be holding "office hours" per se. I will however make myself as available as possible via other lines of communication.

The best way to get a hold of me for questions will be via email. I will try and respond to these as quickly as I can. I probably will respond within 24 hours during the week BUT more sporadically during the weekend. If you email me during the weekend I likely will respond by Monday morning. Finally, if you are in Ft. Collins and would like to meet face-to-face write me an email and we can set up a time to meet

TA:	Andrew Platt
E-mail	CSURamsBiochem351@gmail.com

Your Email: The email account I will send email messages to will be the one you have currently registered with Colorado State University. If you have not received an email from me by the 1st day of the class you are likely not checking the correct account. If you don't know what email account you should check visit the following URL:

http://www.acns.colostate.edu/Services/Email

Prerequisites: 1 semester of Organic Chemistry and 1 semester of College Biology

Textbook: The **REQUIRED TEXT** is Principles of Biochemistry, 1st edition, by Aaron J. Sholders and Brian Kalet, Great Rivers Technology Publishers. An access code for the book can be purchased at the bookstore or at this URL: http://www.grtep.com

Learning goals: Principles of Biochemistry is designed to introduce you to major topics in the field of biochemistry. The class is broken into three major units: Structural Biology, Protein Function, and Metabolism. In the first unit we will focus exclusively on chemical concepts and protein structure. In the 2nd unit we will focus on enzymology, ligand binding, and membrane transport. The final unit will focus on carbohydrate metabolism and cellular respiration. A complete list of Learning objectives will be placed on Canvas. Students will be strongly encouraged throughout the semester to read and understand these objectives. Below are the learning goals for the semester:

Upon completion of BC351 students will…

1. *Understand the chemical properties of the molecular components of living organisms and the physical basis for interactions within and between these molecules.*
2. *Understand the physical driving forces operating in biochemical processes of living organisms.*
3. *Understand the dynamic and regulatory nature of biochemical pathways needed to maintain biological steady states.*

Canvas: All course material will be presented via Canvas. Here are a couple of links to help you get familiar with Canvas:

1. Login page:
    a. http://info.canvas.colostate.edu/login.aspx
    b. You will need an eID and password to login. If you don't have one of these you can get it from this website. Simply click on "Your CSU eID" http://www.acns.colostate.edu/
2. Getting Started in Canvas:
    a. Here is a link to a student resource page that will help introduce you to Canvas and how to best use it along with other information:
        i. http://info.canvas.colostate.edu/student-resources.aspx
3. In Canvas:
    a. Course home page
        i. When you login to this course this will be the default page.
    b. Announcement
        i. I will make weekly "announcements" regarding what is due for that week.
        ii. I will also use this page to update you on the "happenings" in the course.
    c. Modules:
        i. There are 19 modules in this class. The 1st module is the syllabus module that contains:
            1. Syllabus and Course schedule
            2. eBook introductory recording
            3. How to use the ebook's grade book
            4. A link to the Textbook (you will need to login from this)
        ii. There are 14 modules that correspond directly to a chapter within the book. In each of these modules you will find:
            1. A powerpoint file for that modules set of lectures.
        iii. There are 4 exam study materials modules:
            1. These modules contain: study guides, practice exams, and a recording of the exam review. They are found immediately following the last chapter

for that exam.

d. Assignments:
    i. This is where your exams will be found.
    ii. Remember that your quizzes will be found in the book.
e. Grades
    i. I will report the grades on all your assignments in this tool as well as your final grade.
f. People
    i. A list of all the people currently enrolled in the course.
g. Echo360
    i. This page will take you to recordings of each day's lecture.
h. Media Gallery
    i. This page contains media (mostly Youtube videos) that I have spent time researching and feel they will help you understand the material.

Course Materials: I am going to give you several things to help you gain knowledge of the principles of Biochemistry. Ultimately, I will leave it up to you to determine how to go through the resources I am making available but the book and the lecture recordings are the "organizing force" of the course.

1. The Book
    a. Contains material that will be covered in the lecture plus a small amount of additional material.
    b. Contains your graded quizzes (more on this below).
    c. Contains practice materials.
    d. I have made an audio-visual recording of myself going over the workings of the book. ***PLEASE LISTEN TO THIS!*** I also have posted a document in the syllabus/schedule link on Canvas that describes how to use the grade book.
2. Lecture Recordings:
    a. The material that we will cover in this class is best broken down into 14 different topics. Accompanying each topic will be several lecture recordings.
    b. Each lecture recording is an audio-visual file of a lecture that I gave in my traditional course last semester (SP18). There is therefore an audience of about 125-150 people that interact with me via questions. Most of the time I repeat the questions so that you know what was being asked. I do allude to upcoming tests and days of the week in many of these lectures. You will need to remember that these dates/days of the week apply to the audience for that class and ***NOT TO YOU***. The schedule for this class determines your tests dates etc.
3. Powerpoints
    a. Each recording is an audio walkthrough of a powerpoint

presentation. I am going to make these powerpoint files available to you if you would like to use them to make notes on.

4. Study Guides
    a. These are very general questions directing your studying and your thinking.
5. Learning Objectives
    a. I would STRONGLY encourage you to look at these and make sure you can "do them".
6. Practice exams
    a. These are questions that I have used on passed exams. Use these as truly a practice exam. Take them without any outside assistance to give yourself the most realistic evaluation of your knowledge.

Assignments: This class consists of 14 chapter quizzes (5 points each) and 4 exams (100 points each) as detailed below:

1. Chapter Quizzes – 70 points
    a. These will be presented through the book. There will be a total of 14 quizzes equaling 70 points. You will have two opportunities to take the quizzes. Your highest score of the two attempts will be recorded. Due dates for the final attempt on each quiz are listed on the schedule.

2. Metacognition Questions- 15 points
    a. These will be presented in the book in the "Metacognition Question Tab". Each chapter will have a single question worth 1 point each. There are no "right" or "wrong" answers for these questions BUT you will need to do them and take them seriously to receive credit for them. Due dates for each question are listed on the schedule.

3. Exams - 400 points
    a. I am going to give four exams each worth 100 points. Exams will be a combination of multiple choice, matching and short answers. Each exam will be made available to you online in a one-week window **ON CANVAS**. Please ***see the schedule for when each exam will be available*** and what it will cover. All exams are password protected and passwords will only be given to University approved proctors. It is your responsibility to select an eligible proctor, schedule exams with your proctor, and abide by all rules for bringing only appropriate materials into the testing area.

Exam Proctoring:

In accordance with Colorado State University Online proctoring guidelines, students have three options for having online exams proctored for this course. To select your proctoring option please go to the following URL and **carefully read** through the instructions for picking one of the three options:
(https://tilt.colostate.edu/testingCenter/facultyResources/proctoring/).

If you have any questions about this please contact the University Testing Center at: 970-491-6498 or proctor@colostate.edu. Below is a description of your options:

1. Take the exam at the University Testing Center (UTC) on-campus in Fort Collins, CO.
2. Take the exam at an accredited University or College Testing center. Any fees that the testing center charges must be covered by you the student.
3. Use ProctorU, an online proctoring service, which requires that your computer has a webcam and a microphone. If your computer meets the technical requirements, you can take exams on your own computer from the privacy of your own home. You must schedule your exams at least three days in advance to avoid paying a fee. ProctorU offers appointments seven days a week, including night and weekend hours. The cost for online proctoring through ProctorU is included in the cost of the course (unless the student is delinquent in scheduling their exams). Students are responsible for purchasing any hardware that may be needed for exams taken with ProctorU, including a webcam and microphone. They must also have a broadband internet connection. Once again, please go to the URL listed above and read all instructions regarding this option.

How to Study:

The question I am most often asked by students is "How do I study for this class?" As such I have decided to provide the answer up front so you can get started right away!

The objective of studying is to learn the material that is being presented. Exams are designed to assess whether you have learned. So really the question is "How do I learn in this class?" I think the best way to do this is to come to class prepared. Do this by answering the questions I have given you in the study guides and your initial chapter quiz attempt PRIOR TO THE DAY THAT YOU LISTEN TO THE MATERIAL. To do this you can use the text, the internet, my skeleton notes, and whatever other resource you find helpful. If you can't come to an answer you are satisfied with, no big deal, at least you have thought about the material before listening to the recording. Now when you listen to the recording your mind will be better prepared to understand the material I am presenting and you will be much

more able to pick out the important points in my lecture. Once the lecture is done, review your notes, review the chapter, and maybe even listen to the lecture again and then reattempt to answer the questions in the study guide. After this take the quiz a 2nd time.

In addition to this I also am providing several short answer questions and practice multiple-choice questions for each chapter. Attempt to answer these questions using your notes and the chapter content. Once you are satisfied that you have the correct answer submit it and the correct answer will then be displayed. After all this if you still feel confused then come and see me and I will hopefully set you straight.

Grades:

Grade	Percentage
A+	97-100%
A	90 - < 97%
B+	87 - < 90%
B	80 - < 87%
C+	77 - < 80%
C	70 - < 77%
D	60 - < 70%
F	below 60%

Grade Breakdown:

Assignment	**Points Counted**
4 Exams (100 points each)	400
Metacognition questions	15
14 Quizzes (5 points each)	70
Total	485

Extra Credit: Over the course of the semester you will find "practice materials" in the book for each chapter. These materials consist of quizzes comprised of multiple choice and short answer questions. They are optional however, I feel that they will be very helpful in preparing you for the exams. As an incentive to do this I will give **10 points extra credit** to any student that completes **85% or more** of these questions. Keep in mind that you *do not have to get the questions correct to get the extra credit, you simply need to do them.* Finally, keep in mind that the practice quizzes for each chapter ***will close the same day of the exam*** that covers those chapters will close. In other words, you will need to work on these throughout the semester!

Academic Integrity: This course will adhere to the Academic Integrity Policy of the Colorado State University General Catalog. In summary, my desire is that this class maintains a HIGH level of academic integrity consistent with the Student Code of Conduct.

End of the Semester: I know that there will be a handful of people at the end of the semester that need "just a few points" to get the grade they desire. The extra credit assignment will be designated as THE mechanism to get these points. ***I WILL NOT NEGOTIATE GRADES AT THE END OF THE SEMESTER.*** It is my expectation that you will accept the grade assigned to you and take responsibility for YOUR work throughout the semester. Grade negotiation always leads to someone receiving special treatment and is a policy that I cannot abide as I desire to maintain an atmosphere of academic honesty and integrity. If you are concerned about your grade please come and talk to me ***DURING*** the semester when something ***can be done*** about it.

Lecture Schedule

All Assignments are due at 11:59PM MDT/MST on dates listed here.

WEEK	TOPIC	TEXT	QUIZ (DUE)	METACOG? (DUE DATE)
ONE	Introduction – **Lecture 0**			
	Laying Foundations – **Lecture 1**	Chapter 1	***1 (8/28)***	***1 (8/24)***
TWO	Molecular Interactions in a Biological Context – **Lecture 2**	Chapter 2	***2 (9/4)***	***2 (8/28)***
	Acid/Base Chemistry and the Limits of Biological Life – **Lecture 3**	Chapter 3	***3 (9/4)***	***3 (8/31)***
THREE	Amino Acids: The Building Blocks of Proteins – **Lecture 4**	Chapter 4	***4 (9/11)***	***4 (9/6)***
	The Three-Dimensional Structure of Proteins – **Lecture 5** *(Through LN05B)*	Chapter 5		
FOUR	The Three-Dimensional Structure of Proteins – **Lecture 5** *(Finish LN05G - LN05I next week)*	Chapter 5	***5 (9/21)***	***5 (9/20)***
FIVE	**EXAM I – Worth 100 Points** ***Over LN01-LN05*** ***Opens 9/17 and Closes 9/24 at 11:59PM***	Chapters 1-5		
	Enzymes: The Catalyst of Biological Life – **Lecture 6** *(Through LN06B)*	Chapter 6		
SIX	Enzymes: The Catalyst of Biological Life – **Lecture 6**	Chapter 6	***6 (10/2)***	***6 (10/1)***
	Enzyme Kinetics: Measuring and Comparing Enzyme's Abilities – **Lecture 7**	Chapter 7	***7 (10/2)***	***7 (10/2)***

SEVEN	Ligand Binding, Allostery, and Cooperativity – **Lecture 8** *(Finish LN08E next week)*	Chapter 8	***8 (10/12)***	***8 (10/11)***
EIGHT	**EXAM II – Worth 100 Points** ***Over LN06-LN08*** ***Opens 10/8 and Closes 10/15 at 11:59PM***	Chapters 6-8		
	Membrane Proteins and Transport – **Lecture 9** *(Through LN09B)*	Chapter 9		
NINE	Membrane Proteins and Transport – **Lecture 9**	Chapter 9	***9 (10/23)***	***9 (10/22)***
	Bioenergetics and Metabolic Themes – **Lecture 10** *(Through LN10B)*	Chapter 10		
TEN	Bioenergetics and Metabolic Themes – **Lecture 10**	Chapter 10	***10 (10/30)***	***10 (10/29)***
	Carbohydrate Metabolism – **Lecture 11** *(Through LN11C)*	Chapter 11		
ELEVEN	Carbohydrate Metabolism – **Lecture 11**	Chapter 11	***11 (11/9)***	***11 (11/6)***
TWELVE	**EXAM III – Worth 100 Points** ***Over LN09-LN11*** ***Opens 11/5 and Closes 11/12 at 11:59PM***	Chapters 9-11		
	Metabolic Control - **Lecture 12**	Chapter 12	***12 (11/27)***	***12 (11/15)***
THIRTEEN	The Citric Acid Cycle- **Lecture 13**	Chapter 13	***13 (12/4)***	***13 (11/29)***
FOURTEEN	Oxidative Phosphorylation – **Lecture 14** *(Through LN14D)*	Chapter 14		
FIFTEEN	Oxidative Phosphorylation – **Lecture 14**	Chapter 14	***14 (12/7)***	***14 (12/6)***
SIXTEEN	**EXAM IV – Worth 100 Points** ***Over LN12-LN14*** ***Opens 12/4 and Closes 12/11 at 11:59PM***	Chapters 12-14		