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

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Office Hours:	Monday 3:00 – 4:00 PM or by appointment via MS Teams

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 please visit this webpage.

Prerequisites: 1 semester of Organic Chemistry and 1 semester of College Biology – PLEASE CONTACT ME IF YOU DON'T HAVE AT LEAST THESE COURSES AND YOU ARE ENROLLED IN THIS COURSE.

Textbook: The course materials are available through the CSU Inclusive Access Program. These materials include online homework, quizzes and/or access to the eBook. The access is **REQUIRED** for this class, so you can utilize the bookstore program or you must find it on your own. Please watch for emails from the "CSU Bookstore" about 'opting out' as well as charges to your student account. These emails will be sent to your official "@colostate.edu" address. You can manage all these materials by clicking on "**Manage eResources**" in Canvas after clicking on our class.

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. 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".
2. Getting Started in Canvas:
    a. Here is a link to a Canvas student resource page that will help introduce you to Canvas and how to best use it along with other information.
3. In Canvas you will find the following:
    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 particular week.
        ii. I will also use this page to update you on the "happenings" in the course.
    c. Modules:
        i. Syllabus module that contains:
            1. Start Here page (please visit this).
        ii. Fourteen Chapter modules that contain:
            1. A powerpoint file for that the modules set of lectures.
            2. Link to the discussion forum for each Echo360 recording and the polleverywhere questions for that particular day.
        iii. Four exam study materials modules that contain:
            1. Study guides, practice exams, and learning objectives. They are found immediately following the last chapter for that particular exam.
    d. Assignments:
        i. This is where your exams will be found.
        ii. Remember that your **quizzes and other assignments** 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. Echo360
        i. This page will take you to recordings of each day's lecture.

Attendance: "Attendance" to every class is strongly encouraged and will be a determining factor for your success in this class. Attendance in the online course is simply done by listening to each lecture recording in Echo360 and responding to the polleverywhere question for the day by filling out the discussion forum. You will be held accountable for all material presented in these recordings.

SDC arrangements: If you are a student who will need accommodations in this class due to a disability or chronic health condition, please provide me the SDC accommodation letter. If you do not already have these accommodation letters, please contact the SDC as soon as possible to initiate the process of setting up accommodations. The SDC is located in room 121 of the TILT building. You can reach them by phone at 970-491-6385 or at this website.

Assignments: This class consists of 14-chapter quizzes (5 points each), 4 exams (100 points each), 2 drag-n-drop assignment (30 points), 1 worksheet assignment and accompanying quiz (10 points), 4 structural tutorials and accompanying quiz 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. Glycolysis and Citric Acid Cycle Drag-n-drop assignment – 15 points
   a. These assignments will be presented in the book in Chapter 11 and 12. In class discussion will follow. As the time approaches, I will be giving more information about this.
3. Structural tutorials and Chapter 8 worksheet – 50 points
   a. These assignments will be presented in the book with accompanying quizzes for chapters 4, 5, and 8 material. "In class" discussion will follow on echo360. As the time approaches, I will be giving you more information about this.
4. 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**. This window allows you the freedom to schedule a time that works best for you to accomplish the assignment. Please ***see the schedule for when each exam will be available*** and what it will cover. All exams must be proctored using the online proctoring software program Honorlock.

Exam Proctoring: In accordance with Colorado State University Online proctoring guidelines, students will use Honorlock, 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. More information regarding setting up your computer to use Honorlock will be given in Canvas announcements in the weeks leading up to the 1st exam.

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
Drag-n-drop assignments	30
Chapter 8 work sheet	10
Structural tutorials	40
14 Quizzes (5 points each)	70
Total	550

Extra Credit: In previous semesters I used the online classroom participation tool "iclicker". As you listen to content via Echo360 of the previous semester's recordings you will notice that I often poll students using this online tool. You cannot participate live in the polling as the polling was done in SP2022. However, I am going to make discussion forums available on Canvas that will have specific due dates. These forums will ask you to respond to the polls that were conducted in that specific days Echo360 recording. If you participate in 80% or more of these discussion forums, on time, then I will give you **10 points extra credit**. I do want to make a disclaimer about these discussion forums. They will be given a point value of 0.01 points. This will allow me to easily track your participation in order to award the extra credit while not significantly impacting the grade that Canvas reports to you. Understand that the 0.01 points WILL NOT count toward or against your final grade. Rather, it will only count toward allowing me to award the extra credit.

In addition to the discussion forum, over the course of the semester you will find "practice materials" in the book for each chapter. These materials are 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 **5 points extra credit** to any student that completes **twelve chapters or more** of these questions. *Keep in mind that you do not have to get all the questions correct to get the extra credit, you simply need to do them and record a* ***numerical score greater than zero on them***. Finally, keep in mind that the practice quizzes for each chapter ***will close as follows:***

Chapters 1-4: Close 9/20 at 11:59PM (same day as exam 1)
Chapters 5-8: Close 10/17 at 11:59PM (same day as exam 2)
Chapters 9-11: Close 11/14 at 11:59PM (same day as exam 3)
Chapters 12-14: Close 12/13 at 11:59PM (same day as exam 4)

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 Mountain time zone on dates listed here.

WEEK	TOPIC/ASSIGNMENT	TEXT	QUIZ (DUE)
ONE	Introduction – **Lecture 0**		
	Physical Considerations for Living Systems – **Lecture 1** (*Through LN01D)*	Chapter 1	***1 (8/30)***
TWO	Chemical Considerations for Living Systems **– Lecture 2**	Chapter 2	***2 (9/6)***
THREE	Biological Considerations for Living Systems (Gene Expression) **– Lecture 3**	Chapter 3	***3 (9/13)***
	Amino Acids: The Building Blocks of Proteins – **Lecture 4**	Chapter 4	***4 (9/13)***
	Amino Acid Structural tutorial	Chapter 4	***9/8***
FOUR	The Three-Dimensional Structure of Proteins – **Lecture 5** *(Through LN05D)*	Chapter 5	
	Peptide Backbone Tutorial and Quiz – *Complete prior to listening to LN04C/LN05A*	Chapter 5	***9/12***
	Secondary Structure Tutorial and Quiz – *Complete prior to listening to LN05C*	Chapter 5	***9/13***
FIVE	**EXAM I – Worth 100 Points** ***Over LN01A-LN05E (Material over Protein folding will be on Exam 2)*** ***Opens 9/13 at 12AM and Closes 9/20 at 11:59PM***	Chapters 1-5	
	The Three-Dimensional Structure of Proteins – **Lecture 5** ***LISTEN TO LN05E BEFORE EXAM*** *FINISHI LN05F & LN05G/LN06A AFTER EXAM*	Chapter 5	***5 (9/27)***
SIX	Enzymes: The Catalyst of Biological Life **– Lecture 6**	Chapter 6	***6 (10/4)***
	Enzyme Kinetics: Measuring and Comparing Enzyme's Abilities **– Lecture 7**	Chapter 7	***7 (10/4)***
SEVEN	Ligand Binding, Allostery, and Cooperativity **– Lecture 8**	Chapter 8	

	Mb/Hb Structural Tutorial – *Complete prior to listening to LN08B and after listening to LN07B/LN08A*	Chapter 8	***10/3***
	Hb Structural Tutorial and Quiz – *Complete after listening to LN08C*	Chapter 8	***10/6***
EIGHT	Ligand Binding, Allostery, and Cooperativity **– Lecture 8**	Chapter 8	***8 (10/13)***
	Hb Structural Tutorial Worksheet– *Complete while listening to LN08D*	Chapter 8	***10/10***
NINE	**EXAM II – Worth 100 Points** ***Over LN06-LN08*** ***Opens 10/10 at 12AM and Closes 10/17 at 11:59PM***	Chapters 6-8	
	Membrane Proteins and Transport – **Lecture 9**	Chapter 9	
TEN	Membrane Proteins and Transport – **Lecture 9**	Chapter 9	***9 (10/25)***
	Bioenergetics and Metabolic Regulation – **Lecture 10** *(Through LN10C)*	Chapter 10	
ELEVEN	Bioenergetics and Metabolic Regulation – **Lecture 10**	Chapter 10	***10 (11/1)***
	Carbohydrate Metabolism – **Lecture 11** *(Through LN11B)*	Chapter 11	
	Chapter 11 Drag-n-drop and Quiz – *Complete prior to listening to LN11B*	Chapter 11	***11/2***
TWELVE	Carbohydrate Metabolism – **Lecture 11**	Chapter 11	***11/10***
THIRTEEN	**EXAM III – Worth 100 Points** ***Over LN09-LN11*** ***Opens 11/7 at 12AM and Closes 11/14 at 11:59PM***	Chapters 9-11	
	Citric Acid Cycle - **Lecture 12**	Chapter 12	***12 (11/18)***
	Chapter 12 Drag-n-drop and Quiz – *Complete prior to listening to LN12B*	Chapter 12	***11/16***
FOURTEEN	Oxidative Phosphorylation - **Lecture 13**	Chapter 13	***13 (12/6)***

FIFTEEN	Lipid Metabolism – **Lecture 14**	Chapter 14	***14 (12/9)***
SIXTEEN	**EXAM IV – Worth 100 Points** ***Over LN12-LN14*** ***Opens 12/6 at 12AM and <u>Closes 12/13 at 11:59PM</u>***	Chapters 12-14	