



# COURSE BC 351 SYLLABUS

## INSTRUCTOR INFORMATION

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Q&A/Study Sessions:

## LEARNING ASSISTANT INFORMATION

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## TECHNICAL SUPPORT

Need technical assistance with your online course? Try the following:

- Visit the [Canvas Student Resources](#) for guides and videos.
- Visit [Central I.T. Technical Support Helpdesk](#) for technical support.
- Call 970-491-7276.
- Email [Help Desk Support](#).

## COVID-19 INFORMATION FOR STUDENTS

**All students are required to follow public health guidelines in any university space and are encouraged to continue these practices when off-campus(es). Students also are required to report any COVID-19 symptoms to the university immediately, as well as if they have potentially been exposed or have tested positive at a non-CSU testing location. If you suspect you have symptoms, please fill out the COVID Reporter**

(<https://covid.colostate.edu/reporter/>). If you have COVID symptoms or know or believe you have been exposed, it is important for the health of yourself and others that you complete the online COVID Reporter. Do not ask your instructor to report for you; if you report to your instructor that you will not attend class due to symptoms or a potential exposure, you are required to also submit those concerns through the COVID Reporter. If you do not have access to the internet to fill out the online COVID-19 Reporter, please call (970)491-4600.

If you report symptoms or a positive test, your report is submitted to CSU's Public Health Office. You will receive immediate, initial instructions on what to do and then you will also be contacted by phone by a public health official. Based on your specific circumstances, the public health official may:

- choose to recommend that you be tested and help arrange for a test

- conduct contact tracing
- initiate any necessary public health requirements or recommendations and notify you if you need to take any steps

If you report a potential exposure, the public health official will help you determine if you are at risk of contracting COVID.

For the latest information about the University's COVID resources and information, please visit the **CSU COVID-19 site** (<https://covidrecovery.colostate.edu/>).

## **COURSE DESCRIPTION**

A complete understanding of living systems rests on the foundation consisting of three core areas or key concepts. These areas are 1) the parts of cells – macromolecules, 2) cellular processes – biological chemical reactions, catalysis, energy transformations, and 3) cellular driving forces – chemistry of biological molecules, diffusion/random events, dynamic equilibrium, bioenergetics. These key concepts are central to understanding normal cell function and behavior and how they go awry in cancer cells. These key concepts provide a framework for making sense of cell and organisms. Living systems are very complex and learning all the cellular parts and processes can be overwhelming. Focusing at this “10,000 foot level” first before learning the myriad details can make learning biochemistry more approachable.

Students will learn core concepts and definitions in biochemistry. Understanding and critical thinking are most important and lasting, but knowing a certain amount of content knowledge and learning the biochemistry “language” is required for hanging that understanding on. I hope that you come away from this class thinking that biochemistry is cool and excited to learn more and in greater depth. This course will only give you the tip of the iceberg, but I hope it will provide a springboard for delving into your future areas of interest in greater detail.

## **COURSE PREREQUISITES AND COREQUISITES**

BZ 110 or BZ 120 or LIFE 102; CHEM 245 or CHEM 341 or CHEM 345.

## **COURSE GOALS**

Upon the completion of BC 351, a successful student will be able to:

- Apply and advocate for the centrality of biochemical principles in living systems;
- Illustrate and analyze protein structure and function and cellular metabolism in terms of biochemical principles – the chemical properties of the molecular components (parts) and the biophysical driving forces;
- Name, categorize and explain the composition and structure of proteins and cell membranes in biochemical terms;
- Define, outline and sketch the function of proteins in intermolecular interactions, catalysis and transmembrane transport;

- Describe, illustrate and differentiate the stages, pathways and steps in cellular metabolism (glycolysis, citric acid cycle and oxidative phosphorylation);
- State, examine and interpret the key aspects of metabolic regulation;
- Review, inform, demonstrate and justify how the biochemical core concepts and big ideas inform the current understanding of cancer biology and beer fermentation (for fun);
- Recommend targets for anticancer drugs based on the structure and function of cellular macromolecules, cellular processes and the role of cell driving forces.

## REQUIRED TEXTS

Principles of Biochemistry, 2<sup>nd</sup> edition, by Sholders and Kalet, Great River Learning Publishers, ISBN-9781615496969.

The course textbook is available through the **CSU Bookstore's Inclusive Access Program** in partnership with Unizin Engage. You have immediate access to the online e-text by clicking on the "Manage eResources" link within the course menu in the BC 351 Canvas course. Please note, there is a cost for the e-text. The bookstore will charge your student account for the cost of the e-text after the Add/Drop date, February 3, 2021. You must "opt-out" of the e-textbook before the Add/Drop date to avoid bookstore charges. However, this text is required for the course so you should obtain it through the bookstore or directly from Great River Learning. Please look for emails from the "CSU bookstore" about accessing the eTextbook and 'opting out', as well, as charges to your student account. These emails will be sent to your official CSU email address. To opt out, follow the link in the emails or click on the Manage eResources tab in Canvas. This letter is also posted under the Course Information Module on the BC 351 Canvas course. Once you choose to "opt-out," you will no longer be allowed to access the e-text in Canvas.

## OTHER REQUIRED AND SUPPLEMENTAL MATERIALS

### Assignments

How will you know that you have learned and understood the BC 351 core concepts and ideas? What will your grade be based upon?

#### 1. 12 Module Quizzes – 50 points total

The quizzes will be administered on Canvas. They are all available on June 15 or the same day as the previous exam (for example Module 5-7 Quizzes are available starting June 25), but will be due (must be completed) each Thursday or Sunday night at 11:29 PM (see course schedule). There will be 12 quizzes, you will be allowed two attempts on each and you will receive your highest score.

#### 2. 4 Exams – 400 points total

There will be four exams worth 100 points apiece. The exams will be administered in class. You will have one hour and 50 minutes to complete each exam (Exams 1-3 7:00-8:50 AM). Exams will consist of two matching questions (1 point per match, 10 points total), 50 grouped true/false questions (1.4 points per question, 70 points total) and one four or five-part free response question (4 or 5 points per part, 20 points total). The exams will only cover what I talk

about in class and emphasize in the study guides and quizzes. Exams are closed notes, text, Internet, etc. Exams are proctored (for details see section on proctored exams below).

### 3. iClickers – 20 points total maximum

You can use an iClicker remote, mobile device, tablet or computer for Zoom meeting or in-class participation. iClicker is a response system that allows you to respond to questions I pose during class; you will receive points for participation for half points for correct answers. To receive this credit, you will need to link your iClicker Reef account to the BC 351 Canvas course by the first Friday of the semester (January 22, 2021).

#### For iClicker Reef Account Registration:

Link your iClicker Reef account to BC 351 iClicker Cloud course through iClicker Reef, a one-time registration, in the BC 351 Canvas course to sync your iClicker Reef account with BC 351 by clicking iClicker Sync in the left-hand menu bar of the BC 351 Canvas course. For detailed instructions go to: <https://macmillan.force.com/iclicker/s/article/Student-Guide-Enhanced-Grade-Sync-Integration-with-Canvas?r=220&ui-knowledge-components-aura-actions.KnowledgeArticleVersionCreateDraftFromOnlineAction.createDraftFromOnlineArticle=1>

iClickers will be used every day in class, and you are responsible for bringing your remote or another device for responding when we meet in A102 Clark. When we meet through Zoom you should use a mobile device, tablet or computer.

In-class iClicker questions will be worth 1 point for answering and an additional 0.5 points for answering correctly. These points will be weighted to be worth a maximum total of 20 points (as part of the 510 total possible core points) at the end of the semester. A common misconception is that once a student has accrued 20 points, they have gotten the maximum points they can get for iClicker question participation. That would be counterproductive, since the main purpose behind iClickers is class participation. The student(s) with the most iClicker points will get 20 points. Everyone else will get a proportion of the 20 points scaled to what proportion of the highest number of points they earned. For example, if the highest score is 450 points, that student will get 20 points. If someone else gets 430 points they will get  $430(20/450) = 19.11$  points. In the grand scheme of a course grade, they will be worth 19 points out of the 20 possible iClicker points out of the total 510 points possible in the course.

### 4. In Class Active Learning Activities – 40 points, 10 points each activity, 4 activities

There will be five in class active learning activities to provide interactive, hands-on and engaging means to better grasp difficult concepts. These activities are designed to integrate core concepts and big ideas. Four of these learning activities (Free Energy, Protein Folding, Transmembrane Transport and Metabolic Regulation) will have pre- and post-activity homework assignments worth 5 points each. See the course schedule for due dates. The learning activities will focus on thermodynamics, protein structure and folding, transmembrane transport and metabolic regulation.

### 5. Textbook Assignments and Quizzes – 40 points maximum possible

The online textbook “Principles of Biochemistry” by Sholders and Kalet has practice questions (0 points), quizzes (5 points each, 70 points total), reflection/summary questions (1 point each, 14 points total) for each of the 14 chapters. In addition, there are seven structural tutorials with 5 quizzes (10 points each, 50 points total) and two drag and drop assignments (15 points each, 30

points total). The total possible points that can be accrued within the textbook site for completing all these assignments and quizzes is 154 points.

These points will be weighted to be worth a maximum total of 40 points (as part of the 510 total possible core points) at the end of the semester. A common misconception is that once a student has accrued 40 points, they have gotten the maximum points they can get for textbook assignments and quizzes. That would be counterproductive, since the main purpose behind the textbook assignment completion is for students to practice working through all the course concepts. The student(s) with 154 textbook assignment points will get 40 points ( $154 \times 0.26 = 40$ ). Everyone else will get a proportion of the 40 points scaled to what proportion of the 164 points they earned. For example, if someone gets textbook 150 points, they will get  $150 \times 0.244 = 36.6$  points. In the grand scheme of a course grade, they will be worth 36.6 points out of the 40 possible textbook points out of the total 530 points possible in the course.

**6. Recitations** – 15 points extra credit, must attend 75% to get any points

There will be weekly voluntary recitations led by undergraduate Learning Assistants (LAs) offered at a range of days and times. LAs will facilitate group problem solving activities and discussions on course related materials. Student should join LA led groups on the “People” page on Canvas. Attending a recitation is not required. However, students can earn 15 extra credit points by attending 75% (10) of the recitations.

**7. Discussion Board Posts** (Coffee Shops), **Weekly Questions Surveys** and **Q&A Zoom and Chat Sessions** – extra credit points

Submission of Discussion Board posts under the pinned Coffee Shop threads, completing the Weekly Questions Surveys and attending Q&A Zoom and Chat sessions are not required. However, each Discussion Board post, survey completion and Q&A session attendance is worth 1 extra credit point.

### Course Materials

I will provide materials on Canvas to help you grasp my organization of the course content. These materials define what concepts I want you to know and understand. The materials also aid your study for exams.

1. Text and supplemental article reading
2. 12 Module outlines
3. Lecture slides for note taking
4. Module study guides and answers (pdf and recorded tutorial)
5. Lectures Recordings
6. Recitation group activity questions and answers
7. In class learning activity homework assignments

### ACADEMIC INTEGRITY POLICY

This course will adhere to the CSU Academic Integrity [Policies and Guiding Principles](#) as found in the General Catalog and the [Student Conduct Code](#).

Academic integrity is conceptualized as doing and taking credit for one’s own work. Violations of the university’s academic integrity standards include, but are not limited to:

- Cheating—includes using unauthorized sources of information and providing or receiving unauthorized assistance on any form of academic work or engaging in any behavior specifically prohibited by the faculty member.
- Plagiarism—includes the copying of language, structure, ideas, or thoughts of another, and representing them as one's own without proper acknowledgment.
- Unauthorized Possession or Disposition of Academic Materials—includes the unauthorized selling or purchasing of examinations or other academic work; stealing another student's work; unauthorized entry to or use of material in a computer file; and using information from or possessing exams that an instructor did not authorize for release to students.
- Falsification—includes any untruth, either verbal or written, in one's academic work.
- Facilitation—includes knowingly assisting another to commit an act of academic misconduct.
- The use of online "homework helper" sites including, but not limited to, Chegg, NoteHall, Quizlet, and Koofers is not permitted during exams in this course. Please reach out to the instructor or one of the LAs to discuss if a specific service you are thinking about using for this course is acceptable.

Use of these types of resources during exams will be considered receiving unauthorized assistance and, therefore, a violation of the student conduct code. Using them may result, at the discretion of the instructor, in a zero for the course, assignment, quiz, or exam. All incidents of this type will be referred to the CSU Student Resolution Center and may be subject to additional University disciplinary action.

At a minimum, violations will result in a grading penalty in this course and a report to the Office of Conflict Resolution and Student Conduct Services.

## CSU HONOR PLEDGE

Academic integrity lies at the core of our common goal: to create an intellectually honest and rigorous community. Because academic integrity, and the personal and social integrity of which academic integrity is an integral part, is so central to our mission as students, teachers, scholars, and citizens, I will ask that you affirm the CSU Honor Pledge as part of completing your work in this course. *While you will not be required to affirm the honor pledge*, you will be asked to affirm the following statement at the start of your exams:

*"I have not given, received, or used any unauthorized assistance."*

Further information about Academic Integrity is available at CSU's [Practicing Academic Integrity](#).

## UNIVERSAL DESIGN FOR LEARNING

I am committed to the principle of universal learning. This means that our classroom, our virtual spaces, our practices, and our interactions be as inclusive as possible. Mutual respect, civility, and the ability to listen to others carefully are crucial to universal learning.

If you are a student who will need accommodations in this class, please contact me to discuss your individual needs. Any accommodation must be discussed in a timely manner prior to implementation. A verifying memo from [Resources for Disabled Students](#) may be required before any accommodation is provided.

## COURSE PRESENTATION AND PROCEDURES

Organization of content: 1 module/week comprised of readings, lectures, recordings, learning activities, quizzes and graded assignments. | Students should complete all tasks in each module before moving on.

## SUGGESTED STUDY METHODS

View the lectures prepared (know something about what I will talk about) having read the textbook pages and looked over the lecture outlines and the study guide questions for the lecture. Review lecture notes and the study guide questions and attempt to answer these questions completely. If you do not have a good understanding of the questions and how to answer them ask about them by email to the instructor or LAs, by posting your question on the Canvas Discussion Board (Coffee Shops) and at Q&A sessions and recitations. Use the quizzes as practice for the exams. Study your notes including key terms and concepts, and then take the quiz the first time without your notes. If you do not do as well as you would like, review your notes again and take the quiz a second time with your notes and book open. Repeat this process until you can answer all the questions correctly. Finally, I strongly suggest that you **practice drawing out the biochemical processes on a white board multiple times** rather than just looking over them in order to study them **and that you start this process a few weeks before the exams**. You will find the information sticks in your memory much more quickly and you will recognize gaps in your understanding more readily. Using this approach in a study group is even more effective.

College education requires skills and habits that may be less essential in traditional courses. In order to be successful in your online course you will need:

- Space—Establish a comfortable and well-organized physical study space.
- Time management skills—Set personal study and "classroom" time as you would do for a traditional course.
- Organization skills—Print out all class material (modules, PowerPoints, assignments, additional resources, and any work you generate) and keep everything in a single location. Maintain electronic backups of all class materials.
- Communication skills—Demonstrate a willingness to interact with your instructor and classmates through email, phone calls, discussion boards, and active participation in all class activities.
- Initiative—Seek help from your instructor and classmates, ask questions as they arise on the Canvas Discussion Board Coffee shops.

- Discipline—Pace yourself, complete all activities and assignments before the due date, follow through on all class requirements to completion. Start studying immediately after an exam for the next exam.

The more closely you adhere to the recommendations above the greater your chances of having a successful semester and a rewarding online experience.

## GRADING

As a student enrolled in this course, one of your responsibilities is to submit course work by the due dates listed in the Course Schedule. With that said, I take my role as your instructor very seriously, and, in fact, I care about how well you do in this course and that you have a satisfying, rewarding experience.

There are a total of 400 points for exams. Each of the 4 exams in BC 351 will be worth 100 points each (400 total). There are a total of 50 points for quizzes. Each of the 12 quizzes will be worth 5 to 7 points but their value in your final grade will be scaled to 50 points total possible (for example, 60 points/1.2 = 50 points possible). In addition, there will be 40 homework assignment points possible. Finally, there will be 40 textbook assignment and quiz points possible for a total of 530 core assignment points possible. If you achieve the following point totals for BC 351 you will be assured of the minimum letter grade shown:

477-530 ( $\geq 90\%$ )	A
424-476 (80-90%)	B
371-423 (70-80%)	C
318-370 (60-70%)	D
<318 (<60%)	F

Each exam will not be curved individually, but the final total points required for a course grade might be curved downward depending on the averages and distribution of points. In addition, your grade for BC 351 will be determined based on the total 530 points (combined). Students in BC 351 have averaged around 78 to 80% of the total points possible over the past several years. As a result, there is usually no grading curve. Please note that plus/minus grading will be used.

### Missed Exams and Re-grading of Exams

There will be no make-up exams offered. Exams or quizzes you have missed without an excuse will be graded as zero. If you have an excused absence (based on written or other verifiable evidence) from an exam or quiz, your final grade will be based on a percentage of the total possible points for the exams and quizzes you did take. Students can schedule to take an exam early with the instructor if they know they cannot take the exam during the regularly scheduled dates and times. If you have questions concerning the grading of any of your exams or quizzes, you should submit an email indicating the questions you want re-graded to the instructor within one week of the date of being graded. You must also provide a written explanation as to why you feel the question should be re-graded. Re-grade requests will not be



accepted after this one-week period, so go over your exam carefully soon after it has been returned to you.

## QUIZ AND EXAM DETAILS

Quizzes will consist of 10 to 12 multiple choice questions taken on Canvas. Exams will consist of matching (2 five-part questions worth 10 points each), multiple choice (10 questions worth 4 points each) and two free response (2 five part questions worth 20 points each).

## OPTIONS FOR EXAM PROCTORING

This course requires that all exams are proctored. Proctors are individuals who administer the exam process following the guidelines provided by Colorado State University to ensure academic integrity.

BC 351 students have two options for having online exams proctored for this course:

1. Take the exams during the regular class times for each section and during the finals week exam times for each section (see the BC 351 Schedule). You will be allowed up to two hours (7-8:50 AM) to complete each of the four exams.
2. Take the exams at the **University Testing Center (UTC)** on-campus in Fort Collins, CO. Schedule an appointment in advance at <http://tilt.colostate.edu/testingCenter/csuOnline/> or by calling 970-491-6498. The cost to take an exam at the UTC is \$5 per half hour.

If you have any questions or concerns about proctoring outside of class time, see <http://www.online.colostate.edu/current-students/proctoring.dot> or contact the University Testing Center at 970-491-6498 or [proctor@colostate.edu](mailto:proctor@colostate.edu).

## GRADE DESCRIPTION

<b>97.5-100 % = A+</b>	<b>90-97.4 % = A</b>	<b>88.8-90 % = A-</b>
<b>87.5-88.7 % = B+</b>	<b>80-87.4 % = B</b>	<b>78.8-80 % = B-</b>
<b>77.5-78.7 % = C+</b>	<b>70-77.4 % = C</b>	
	<b>60-69.9 % = D</b>	
	<b>0-59.9 % = F</b>	

## MAKE UP POLICY

There will be no make-up exams offered. Exams or quizzes you have missed without an excuse will be graded as zero. If you have an excused absence (based on written or other verifiable evidence) from an exam or quiz, your final grade will be based on a percentage of the total possible points for the exams and quizzes you did take. Students can schedule to take an exam early with the instructor if they know they cannot take the exam during the regularly scheduled dates.

## SYSTEM, MULTIMEDIA, AND SOFTWARE REQUIREMENTS

Having trouble with the multimedia in this course? See the solutions below. Also, it is highly recommended that you access your course via a **high-speed Internet connection**.

- Problems with opening PDFs?
  - Download [Adobe Reader](#).
- Canvas acting funny?
  - Review Canvas guide for [Supported Browsers](#).
- YouTube videos not playing?
  - Download [Flash Player](#).
- Videos not opening or playing on your Mac?
  - Download [Windows Media Components for QuickTime](#).
- Still having issues:
  - Call the **CSU Help Desk at 970-491-7276** or [Email Help Desk Support](#)

You must have speakers installed and working properly on your computer before beginning the course.

You may need access to Microsoft Word, PowerPoint, and/or Excel to complete assignments. If you do not have access to the Microsoft Office applications, you may use one of the following free resources that allow you to save your files with Microsoft Office file extensions (.doc, .docs, .ppt, .xls.):

- [Google Apps for CSU](#)—a free, outsourced communications suite endorsed by The University Technology Fee Advisory Board (UTFAB)
- [Office 365](#)—the full version of Microsoft Office free of charge for CSU students.